*** P E A K F I T R E P O R T *** 19-NOV-97 02:35:40

peak no.		nuclide(s)		centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	err %
Peak at 36.53 keV dropped from analysis due to negative area										
	1	NATURAL		126.50	63.24	1.11	213.4	15.85	5.3	26.3
M	2	PB-214	NATURAL	149.68	74.82	1.14	901.8	5.27	17.5	12.1
B	2				74.82		197.8	4.42		
M	3	PB-214		154.34	77.15	1.14	1076.2	4.58	20.0	10.5
M	4	NP-237	EU-155	174.48	87.21	1.16	440.8	9.43	7.2	10.7
		NATURAL								
M	5			179.88	89.91	1.16	68.4	48.61	1.1	48.8
M	6	NATURAL		185.02	92.47	1.16	508.5	7.95	7.9	8.9
	7	TE-131		299.34	149.58	1.08	54.6	55.04	0.8	55.1
	8	NATURAL	XE131M	327.26	163.53	0.98	72.2	40.22	1.1	40.4
	9	NATURAL	NATURAL	372.21	185.99	1.32	1304.2	3.65	21.3	5.3
M	10	NATURAL		477.87	238.79	1.31	39.9	66.02	0.8	66.1
B	10				238.79		39.1	15.64		
M	11			484.23	241.97	1.31	1144.1	3.79	24.0	5.6
M	12	PB-214		590.72	295.21	1.36	2619.0	2.19	68.1	4.1
M	13	NATURAL		600.42	300.05	1.37	18.7	112.22	0.5	112.2
	14	PB-214		703.99	351.84	1.50	4321.1	1.63	137.1	3.5
B	14				351.84		44.1	11.12		
	15	ANN-RD		1021.70	510.74	2.44	146.3	16.16	7.1	16.3
B	15				510.74		108.3	5.57		
	16	BI-214		1218.53	609.22	1.69	2735.6	2.05	161.4	4.0
B	16				609.22		76.8	6.05		
	17	CE-143		1330.75	665.36	1.90	62.3	25.31	4.0	25.3
	18			1536.42	768.28	1.95	251.3	8.14	19.0	8.6
B	18				768.28		10.1	33.57		
	19	Y-92		1867.22	933.81	2.03	141.5	12.21	13.0	12.4
	20	RB-89	I-134	1896.19	948.31	1.49	23.2	60.62	2.2	60.6
	21	BI-214		2239.84	1120.23	2.39	525.4	5.04	58.2	5.7
B	21				1120.23		33.9	10.06		
	22	CO-60		2345.00	1172.83	1.79	44.2	29.21	5.1	29.3
B	22				1172.83		45.8	7.93		
	23	BI-214	CO-56	2475.37	1238.03	2.36	155.1	10.97	19.0	11.3
B	23				1238.03		12.9	22.37		
	24	BI-214		2755.03	1377.83	2.74	131.6	11.55	18.0	11.9
	25	EU-152		2815.47	1408.03	2.97	62.9	20.06	8.8	20.2
	26	NATURAL		2921.10	1460.81	2.47	523.1	4.88	75.9	5.7
B	26				1460.81		467.2	1.70		
	27			3458.56	1729.09	2.56	78.4	14.06	13.6	14.4
	28	BI-214		3528.39	1763.91	2.88	393.9	5.41	70.1	6.4
B	28				1763.91		33.7	7.16		

M - Peak is a multiplet
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0004.MCA
Background description: 25K SEC BKG 4/21/97

*** R A D I O N U C L I D E R E P O R T *** 19-NOV-97 02:35:40

mple description :CARPET 1
alyzed by :ELM

number	nuclide	conf.value	Activity (uCi/EA) measured		decay corrected	
1. Fission gases						
2	XE-131M	0.9685	1.47E-03	+-5.96E-04	1.54E-03	+-6.24E-04
		total	1.47E-03	total	1.54E-03	
2. Iodines						
		total	0.00E+00	total	0.00E+00	
3. Particulates						
1	Y-92	0.1917	2.75E-03	+-3.42E-04	1.07E-01	+-1.34E-02
3	EU-155 ?	0.3116	5.70E-04	+-6.12E-05	5.71E-04	+-6.12E-05
4	NP-237 ?	0.6398	1.54E-03	+-1.65E-04	1.54E-03	+-1.65E-04
		total	4.86E-03	total	1.10E-01	

? = nuclides with a common single line, cannot identify which one is present

ese peaks were not identified

number	channel	energy	peak intensity (gps)			
1	126.5	63.24	5.3490E+00	+-1.41E+00	NATURAL	
2	149.7	74.82	1.3632E+01	+-1.76E+00	PB-214	NATURAL
3	154.3	77.15	2.0033E+01	+-2.12E+00	PB-214	
5	179.9	89.91	1.0826E+00	+-5.28E-01		
6	185.0	92.47	7.8661E+00	+-7.02E-01	NATURAL	
7	299.3	149.58	7.6992E-01	+-4.25E-01	TE-131	
9	372.2	185.99	2.1277E+01	+-1.14E+00	NATURAL	NATURAL
10	484.2	241.97	2.3978E+01	+-1.35E+00		
11	590.7	295.21	6.8094E+01	+-2.85E+00	PB-214	
12	600.4	300.05	4.9426E-01	+-5.55E-01	NATURAL	
13	704.0	351.84	1.3571E+02	+-4.76E+00	PB-214	
14	1021.7	510.74	1.8426E+00	+-1.19E+00	ANN-RD	
15	1218.5	609.22	1.5686E+02	+-6.39E+00	BI-214	
16	1330.7	665.36	4.0450E+00	+-1.03E+00	CE-143	
17	1536.4	768.28	1.8213E+01	+-1.65E+00		
19	1896.2	948.31	2.1748E+00	+-1.32E+00	RB-89	I-134
20	2239.8	1120.23	5.4407E+01	+-3.30E+00	BI-214	
21	2475.4	1238.03	1.7411E+01	+-2.17E+00	BI-214	CO-56
22	2755.0	1377.83	1.7962E+01	+-2.14E+00	BI-214	
23	2815.5	1408.03	8.7782E+00	+-1.78E+00	EU-152	
24	2921.1	1460.81	8.1115E+00	+-3.88E+00	NATURAL	
25	3458.6	1729.09	1.3643E+01	+-1.97E+00		
26	3528.4	1763.91	6.4102E+01	+-4.43E+00	BI-214	

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 19-NOV-97 02:35:40

mple description :CARPET 1
Analyzed by :ELM

		MDA (uCi/EA) measured	decay corrected
NA-24	: MDA :	2.51E-04	5.96E-04
AR-41	: MDA :	2.37E-04	2.87E-01
CR-51	: MDA :	1.16E-03	1.19E-03
MN-54	: MDA :	2.04E-04	2.05E-04
MN-56	: MDA :	2.18E-04	3.34E-02
CO-57	: MDA :	9.01E-05	9.03E-05
CO-58	: MDA :	2.18E-04	2.20E-04
FE-59	: MDA :	4.34E-04	4.39E-04
CO-60	: MDA :	2.77E-04	2.77E-04
CU-64	: MDA :	4.95E-02	1.38E-01
NI-65	: MDA :	1.10E-03	1.90E-01
ZN-65	: MDA :	6.61E-04	6.63E-04
SE-75	: MDA :	1.39E-04	1.40E-04
BR-84	: MDA :	5.34E-04	2.29E+07
KR-85	: MDA :	3.73E-02	3.73E-02
SR-85	: MDA :	1.63E-04	1.65E-04
SR-85M	: MDA :	1.15E-04	2.09E-03
-87	: MDA :	2.92E-04	7.88E+00
-88	: MDA :	3.60E-04	3.47E-02
Y-88	: MDA :	1.93E-04	1.94E-04
RB-88	: MDA :	2.04E-03	2.02E+16
RB-89	: MDA :	1.04E-03	> 1.00E+20
KR-89	: MDA :	5.20E-03	> 1.00E+20
Y-91M	: MDA :	1.66E-04	1.05E+03
SR-91	: MDA :	7.26E-04	2.85E-03
SR-92	: MDA :	3.72E-04	4.47E-02
Y-93	: MDA :	1.60E-03	5.79E-03
Y-94	: MDA :	8.86E-04	1.07E+15
Y-95	: MDA :	4.45E-03	> 1.00E+20
NB-95	: MDA :	2.53E-04	2.57E-04
NB-95M	: MDA :	4.03E-04	4.69E-04
ZR-95	: MDA :	3.70E-04	3.73E-04
ZR-97	: MDA :	2.91E-03	6.28E-03
NB-97	: MDA :	1.83E-04	8.95E+00
MO-99	: MDA :	1.49E-03	1.81E-03
TC-99M	: MDA :	1.05E-04	1.28E-04
MO-101	: MDA :	1.25E-03	> 1.00E+20
TC-101	: MDA :	3.48E-04	> 1.00E+20
TC-102M	: MDA :	1.34E-03	> 1.00E+20
RU-103	: MDA :	1.56E-04	1.59E-04
TC-104	: MDA :	3.81E-04	1.82E+15
RH-105	: MDA :	5.90E-04	8.52E-04
U-105	: MDA :	4.04E-04	7.50E-03
-106	: MDA :	1.67E-03	1.67E-03
RU-106	: MDA :	1.67E-03	1.67E-03
AG-108M	: MDA :	1.55E-04	1.55E-04
CD-109	: MDA :	3.36E-03	3.37E-03

AG-110M	MDA	1.89E-04	1.90E-04
SN-113	MDA	2.17E-04	2.18E-04
SB-122	MDA	2.27E-04	2.77E-04
[illegible]-124	MDA	2.02E-04	2.04E-04
[illegible]-125	MDA	4.81E-04	4.81E-04
[illegible]-131M	MDA	6.46E-04	9.95E-04
[illegible]-131	MDA	9.66E-04	4.64E+11
I-131	MDA	1.52E-04	1.63E-04
TE-131	MDA	2.30E-04	7.70E+09
I-132	MDA	1.95E-04	5.72E-02
TE-132	MDA	1.08E-04	1.27E-04
BA-133	MDA	3.79E-04	3.79E-04
TE-133	MDA	4.72E-04	> 1.00E+20
I-133	MDA	1.66E-04	3.09E-04
XE-133M	MDA	9.48E-04	1.21E-03
XE-133	MDA	3.40E-04	3.77E-04
TE-133M	MDA	2.59E-04	3.28E+02
TE-134	MDA	4.19E-04	5.14E+04
I-134	MDA	2.25E-04	6.02E+02
CS-134	MDA	2.23E-04	2.23E-04
I-135	MDA	8.92E-04	6.35E-03
XE-135M	MDA	4.39E-04	> 1.00E+20
XE-135	MDA	1.09E-04	4.54E-04
CS-136	MDA	2.03E-04	2.11E-04
CS-137	MDA	2.26E-04	2.26E-04
CS-138	MDA	3.51E-04	1.11E+07
XE-138	MDA	8.99E-04	> 1.00E+20
CS-139	MDA	1.52E-02	> 1.00E+20
BA-139	MDA	5.17E-04	6.05E+00
[illegible]S-138M	MDA	5.46E-03	> 1.00E+20
[illegible]-139	MDA	1.10E-04	1.10E-04
[illegible]-140	MDA	6.33E-04	6.60E-04
LA-140	MDA	2.68E-04	2.80E-04
BA-141	MDA	5.10E-04	1.64E+15
LA-141	MDA	8.69E-03	2.34E-01
CE-141	MDA	1.76E-04	1.79E-04
BA-142	MDA	1.88E-03	> 1.00E+20
LA-142	MDA	3.18E-04	1.11E+00
CE-143	MDA	4.86E-04	7.20E-04
PR-144	MDA	1.29E-02	1.30E-02
CE-144	MDA	7.63E-04	7.64E-04
PR-146	MDA	5.50E-04	6.74E+10
CE-146	MDA	5.69E-04	> 1.00E+20
ND-147	MDA	4.13E-04	4.34E-04
PR-147	MDA	1.41E-03	> 1.00E+20
PM-149	MDA	4.07E-03	5.20E-03
EU-152	MDA	2.69E-04	2.69E-04
HF-181	MDA	1.74E-04	1.76E-04
W-187	MDA	6.73E-04	1.16E-03
HG-203	MDA	1.37E-04	1.39E-04
NP-237	MDA	9.85E-04	9.85E-04
U-237	MDA	3.23E-04	3.49E-04
NP-239	MDA	3.52E-04	4.43E-04
AM-241	MDA	4.78E-04	4.78E-04
EU-154	MDA	1.90E-04	1.90E-04
[illegible]U-155	MDA	3.65E-04	3.65E-04
[illegible]-94	MDA	1.81E-04	1.81E-04

GAMMA SPECTRUM ANALYSIS

CANBERRA APOGEE V2.4

Canberra Industries, Inc. 18-NOV-97 08:22:25

ANALYSIS PARAMETERS

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 2	ADC unit number	: 3.0
Detector number	: 3	Geometry number	: 2
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 1.0	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
GRA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : URANIUM ROCK Analyzed by: ELM

Sample size : 1.000000E+00 EA Conv. factor : 1.000
Standard size : 1.000000E+00 EA

Sample taken on : 18-NOV-97 at 07:30:00
Collect started on : 18-NOV-97 at 08:05:01
Decay time : 35.0 minutes

live time : 1000.0 seconds real time : 1001.0 seconds
dead time : 0.10 %

Energy calibration used done on 11 / 18 / 1997
Efficiency calibration used done on 11 / 15 / 1996

*** P E A K F I T R E P O R T *** 18-NOV-97 08:22:25

	peak no.	nuclide(s)		centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	err %
	1			96.89	48.59	1.15	26.3	62.22	3.3	75.9
	2	NATURAL		126.32	63.28	1.10	285.0	8.50	21.0	22.6
M	3	PB-214	NATURAL	149.28	74.73	1.09	326.2	8.32	18.9	13.8
M	4	PB-214		154.11	77.14	1.09	679.2	4.97	37.9	10.7
M	5			167.58	83.86	1.10	169.0	13.95	8.6	15.2
M	6	NP-237	EU-155	174.37	87.25	1.10	221.0	11.40	10.9	12.5
		NATURAL	CD-109							
	7	NATURAL		185.10	92.60	1.14	712.1	5.01	33.6	6.4
B	7				92.60		5.6	12.49		
	8	NATURAL		287.80	143.86	1.34	95.9	18.42	4.2	18.7
	9	NATURAL	NATURAL	372.23	185.99	1.23	919.8	3.71	48.8	5.0
B	9				185.99		3.6	16.28		
	10	I-134		472.36	235.98	1.39	95.5	15.26	6.4	15.8
	11			484.58	242.08	1.26	503.7	5.03	34.6	6.5
M	12			538.98	269.24	1.26	60.1	21.08	4.6	21.4
M	13			542.79	271.14	1.26	65.0	20.20	5.0	20.5
	14	PB-214		591.05	295.24	1.31	1017.9	3.42	86.2	4.9
	15	LA-140		659.77	329.56	1.21	23.0	39.37	2.2	39.5
	16	PB-214		704.70	351.99	1.32	1729.4	2.50	177.9	3.9
	17	BI-214		1219.93	609.37	1.53	1026.9	3.22	195.4	4.7
	18			1538.14	768.37	1.84	88.1	12.26	21.6	12.8
	19	BI-212		1572.56	785.56	1.65	27.4	26.40	6.9	26.5
	20	Y-92		1869.87	934.11	1.83	41.1	19.97	12.4	20.1
	21	BI-214		2242.55	1120.28	2.03	169.7	8.15	61.6	8.6
	22	BI-214	CO-56	2477.83	1237.77	2.15	61.9	14.87	24.9	15.0
	23	BI-214		2758.63	1377.94	1.97	47.4	16.93	21.2	17.2
	24	EU-152		2818.63	1407.88	2.00	18.0	34.90	8.2	35.0
	25	BI-214		3532.80	1763.98	2.45	140.9	8.79	80.2	9.4

M - Peak is a multiplet
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0003.MC2
background description: 25K SEC BKG 4/20/97

*** R A D I O N U C L I D E R E P O R T *** 18-NOV-97 08:22:25

mple description :URANIUM ROCK
alyzed by :ELM

number	nuclide	conf.value	Activity (uCi/EA) measured		decay corrected	
1. Fission gases						
		total	0.00E+00		total	0.00E+00
2. Iodines						
		total	0.00E+00		total	0.00E+00
3. Particulates						
1	Y-92	0.2831	2.47E-03	+-4.97E-04	2.77E-03	+-5.57E-04
2	NB-95M	0.9869	6.91E-04	+-1.09E-04	6.94E-04	+-1.10E-04
3	CD-109 ?	0.9071	8.18E-03	+-1.02E-03	8.18E-03	+-1.02E-03
4	EU-155 ?	0.3186	8.66E-04	+-1.08E-04	8.66E-04	+-1.08E-04
5	NP-237 ?	0.6473	2.34E-03	+-2.92E-04	2.34E-03	+-2.92E-04
		total	1.46E-02		total	1.49E-02

? = nuclides with a common single line, cannot identify which one is present

ese peaks were not identified

number	channel	energy	peak intensity (gps)		
1	96.9	48.59	3.2586E+00	+-2.47E+00	
2	126.3	63.28	2.0971E+01	+-4.76E+00	NATURAL
3	149.3	74.73	1.8890E+01	+-2.61E+00	PB-214 NATURAL
4	154.1	77.14	3.7878E+01	+-4.07E+00	PB-214
5	167.6	83.86	8.6334E+00	+-1.32E+00	
7	185.1	92.60	3.3289E+01	+-2.15E+00	NATURAL
8	287.8	143.86	4.2410E+00	+-7.96E-01	NATURAL
9	372.2	185.99	4.8611E+01	+-2.62E+00	NATURAL NATURAL
11	484.6	242.08	3.4558E+01	+-2.26E+00	
12	539.0	269.24	4.6067E+00	+-9.88E-01	
13	542.8	271.14	5.0203E+00	+-1.03E+00	
14	591.0	295.24	8.6249E+01	+-4.27E+00	PB-214
15	659.8	329.56	2.2016E+00	+-8.70E-01	LA-140
16	704.7	351.99	1.7793E+02	+-7.09E+00	PB-214
17	1219.9	609.37	1.9539E+02	+-9.30E+00	BI-214
18	1538.1	768.37	2.1572E+01	+-2.72E+00	
19	1572.6	785.56	6.8773E+00	+-1.83E+00	BI-212
21	2242.6	1120.28	6.1610E+01	+-5.30E+00	BI-214
22	2477.8	1237.77	2.4866E+01	+-3.77E+00	BI-214 CO-56
23	2758.6	1377.94	2.1189E+01	+-3.64E+00	BI-214
24	2818.6	1407.88	8.1909E+00	+-2.87E+00	EU-152
25	3532.9	1763.98	8.0244E+01	+-7.60E+00	BI-214

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 18-NOV-97 08:22:25

ample description :URANIUM ROCK
Analyzed by :ELM

		MDA (uCi/EA) measured	decay corrected
NA-24	MDA	3.62E-04	3.72E-04
AR-41	MDA	3.50E-04	4.37E-04
CR-51	MDA	1.72E-03	1.72E-03
MN-54	MDA	3.15E-04	3.15E-04
MN-56	MDA	3.03E-04	3.54E-04
CO-57	MDA	1.39E-04	1.39E-04
CO-58	MDA	3.32E-04	3.32E-04
FE-59	MDA	5.22E-04	5.22E-04
CO-60	MDA	3.42E-04	3.42E-04
CU-64	MDA	7.99E-02	8.25E-02
NI-65	MDA	1.73E-03	2.03E-03
ZN-65	MDA	8.38E-04	8.38E-04
SE-75	MDA	1.97E-04	1.97E-04
BR-84	MDA	7.54E-04	1.62E-03
KR-85	MDA	5.03E-02	5.03E-02
SR-85	MDA	2.20E-04	2.20E-04
KR-85M	MDA	1.70E-04	1.86E-04
-87	MDA	4.51E-04	6.19E-04
-88	MDA	5.12E-04	5.90E-04
Y-88	MDA	2.42E-04	2.42E-04
RB-88	MDA	1.12E-03	4.39E-03
RB-89	MDA	5.64E-04	2.72E-03
KR-89	MDA	2.72E-03	5.90E+00
Y-91M	MDA	2.27E-04	3.70E-04
SR-91	MDA	9.15E-04	9.55E-04
SR-92	MDA	6.11E-04	7.09E-04
Y-93	MDA	2.53E-03	2.63E-03
Y-94	MDA	5.13E-04	1.88E-03
Y-95	MDA	1.62E-03	1.71E-02
NB-95	MDA	4.16E-04	4.17E-04
ZR-95	MDA	4.63E-04	4.63E-04
ZR-97	MDA	3.90E-03	3.99E-03
NB-97	MDA	2.14E-04	3.00E-04
MO-99	MDA	2.04E-03	2.05E-03
TC-99M	MDA	1.58E-04	1.59E-04
MO-101	MDA	7.01E-04	3.69E-03
TC-101	MDA	1.87E-04	1.03E-03
TC-102M	MDA	6.72E-04	1.78E-01
RU-103	MDA	2.32E-04	2.32E-04
TC-104	MDA	2.32E-04	8.88E-04
RH-105	MDA	8.85E-04	8.95E-04
RU-105	MDA	5.24E-04	5.74E-04
H-106	MDA	2.13E-03	2.13E-03
-106	MDA	2.13E-03	2.13E-03
-108M	MDA	2.04E-04	2.04E-04
CD-109	MDA	6.20E-03	6.20E-03
AG-110M	MDA	2.22E-04	2.22E-04

SN-113	:	MDA	: 3.22E-04	3.22E-04
SB-122	:	MDA	: 3.08E-04	3.10E-04
SB-124	:	MDA	: 2.51E-04	2.51E-04
TE-125	:	MDA	: 7.18E-04	7.18E-04
-131M	:	MDA	: 1.00E-03	1.02E-03
-131M	:	MDA	: 7.23E-03	7.24E-03
I-131	:	MDA	: 6.71E-04	1.92E-03
I-131	:	MDA	: 2.22E-04	2.22E-04
TE-131	:	MDA	: 1.86E-04	4.92E-04
I-132	:	MDA	: 2.63E-04	3.14E-04
TE-132	:	MDA	: 1.68E-04	1.69E-04
BA-133	:	MDA	: 7.96E-04	7.96E-04
TE-133	:	MDA	: 2.17E-04	1.53E-03
I-133	:	MDA	: 2.29E-04	2.33E-04
XE-133M	:	MDA	: 1.57E-03	1.58E-03
XE-133	:	MDA	: 7.16E-04	7.18E-04
TE-133M	:	MDA	: 3.54E-04	5.48E-04
TE-134	:	MDA	: 6.61E-04	1.18E-03
I-134	:	MDA	: 3.03E-04	4.80E-04
CS-134	:	MDA	: 3.40E-04	3.40E-04
I-135	:	MDA	: 1.26E-03	1.33E-03
XE-135M	:	MDA	: 2.42E-04	1.18E-03
XE-135	:	MDA	: 1.65E-04	1.73E-04
CS-136	:	MDA	: 2.98E-04	2.98E-04
CS-137	:	MDA	: 2.95E-04	2.95E-04
CS-138	:	MDA	: 4.85E-04	1.03E-03
XE-138	:	MDA	: 5.72E-04	3.18E-03
CS-139	:	MDA	: 5.98E-03	7.91E-02
BA-139	:	MDA	: 8.44E-04	1.13E-03
CS-138M	:	MDA	: 2.72E-03	1.17E+01
-139	:	MDA	: 1.80E-04	1.80E-04
I-140	:	MDA	: 8.34E-04	8.35E-04
LA-140	:	MDA	: 3.80E-04	3.80E-04
BA-141	:	MDA	: 3.86E-04	1.46E-03
LA-141	:	MDA	: 1.61E-02	1.79E-02
CE-141	:	MDA	: 2.91E-04	2.92E-04
BA-142	:	MDA	: 9.38E-04	9.06E-03
LA-142	:	MDA	: 3.86E-04	4.97E-04
CE-143	:	MDA	: 8.96E-04	9.08E-04
PR-144	:	MDA	: 1.80E-02	1.80E-02
CE-144	:	MDA	: 1.11E-03	1.11E-03
PR-146	:	MDA	: 4.47E-04	1.23E-03
CE-146	:	MDA	: 3.19E-04	1.83E-03
ND-147	:	MDA	: 9.23E-04	9.25E-04
PR-147	:	MDA	: 7.13E-04	4.25E-03
PM-149	:	MDA	: 5.64E-03	5.68E-03
EU-152	:	MDA	: 4.15E-04	4.15E-04
HF-181	:	MDA	: 2.49E-04	2.50E-04
W-187	:	MDA	: 7.82E-04	7.95E-04
HG-203	:	MDA	: 1.97E-04	1.97E-04
NP-237	:	MDA	: 1.80E-03	1.80E-03
U-237	:	MDA	: 5.18E-04	5.20E-04
NP-239	:	MDA	: 5.22E-04	5.25E-04
AM-241	:	MDA	: 7.78E-04	7.78E-04
EU-154	:	MDA	: 2.95E-04	2.95E-04
U-155	:	MDA	: 5.79E-04	5.79E-04
-94	:	MDA	: 2.67E-04	2.67E-04

```
*****************************************************************************
*                                                                           *
*              G A M M A   S P E C T R U M   A N A L Y S I S                *
*                                                                           *
*****************************************************************************

..NBERRA APOGEE V2.4

Canberra Industries, Inc.                                  18-NOV-97   08:23:57

                    A N A L Y S I S   P A R A M E T E R S

Spectrum file number        :  100.0      Sample no.              :    1.0
MCA unit number             :    2        ADC unit number         :  4.0
Detector number             :    4        Geometry number         :    2

Search threshold 1          :  2.0        Search threshold 2      :  3.0
Search  FROM channel        :   50        Search TO channel       : 4095
Id energy tolerance         :  0.8        Order of background     : linear
Smoothing factor            :    0        Random sum corr         : disabled
GRA parameter               :    0        Baseline channels       : disabled

Confidence threshold index :  0.100
Confidence levels      LLD :  1.645 (95.0%)        MDA :  1.645 (95.0%)

Analysis library       : SPF$LIBRARY:SPFANL.LIB;1
Background subtract    : enabled

Sample description     : URANIUM ROCK 2        Analyzed by: ELM

 mple size             :  1.000000E+00  EA      Conv. factor    :    1.000
 candard size          :  1.000000E+00  EA

Sample taken on        : 18-NOV-97    at  07:35:00
Collect started on     : 18-NOV-97    at  08:06:13
Decay time             :        31.2 minutes

live time              :   1000.0  seconds    real time      :   1012.0  seconds
dead time              :  1.19 %

Energy     calibration used done on   11 / 18 / 1997
Efficiency calibration used done on   11 /  8 / 1996
```

*** P E A K F I T R E P O R T *** 18-NOV-97 08:23:57

peak no.		nuclide(s)		centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	err %
Peak at 36.53 keV dropped from analysis due to negative area										
	1	NATURAL		106.41	53.21	1.02	336.9	19.20	35.6	39.7
	2	NATURAL		126.56	63.27	1.15	1951.1	4.27	146.6	21..
M	3	NATURAL		145.45	72.71	1.14	1642.0	5.28	99.2	13.!
B	3				72.71		32.1	7.92		
M	4	PB-214	NATURAL	149.63	74.80	1.14	7260.6	1.59	422.0	11.
B	4				74.80		65.9	4.42		
M	5	PB-214		154.39	77.18	1.14	8170.3	1.49	456.1	9.(
M	6	AG-108M	CE-144	159.00	79.48	1.15	434.5	18.59	23.4	20.(
		I-131	TL-201							
M	7	BA-133	XE-133	162.50	81.22	1.15	566.8	15.52	29.8	17.
M	8	NATURAL		168.45	84.20	1.15	1910.4	4.64	96.6	7.(
B	8				84.20		30.0	9.11		
M	9	NP-237	EU-155	174.49	87.21	1.16	3235.4	2.86	158.0	5.(
		NATURAL								
M	10			179.63	89.78	1.16	1063.8	7.07	50.6	8..
M	11	NATURAL		185.26	92.59	1.16	6142.2	1.73	284.8	4.(
M	12			189.74	94.83	1.16	1361.2	5.82	62.0	6.'
	13			196.86	98.39	1.28	1998.3	3.93	88.7	5.4
	14	NATURAL		287.78	143.80	1.31	1036.7	6.85	43.2	7.'
	15	XE-138		308.52	154.17	1.46	493.9	13.12	21.2	13.(
	16	BA-140	NATURAL	326.33	163.07	1.37	403.3	15.48	17.8	16.(
	17	NATURAL	NATURAL	372.14	185.95	1.35	8357.2	1.36	409.0	4.(
	18			411.13	205.44	1.42	344.8	16.49	18.4	16.'
	19	I-134		471.97	235.85	1.26	580.2	9.79	35.5	10.(
	20			484.17	241.94	1.36	7009.1	1.45	440.7	4.4
M	21			512.54	256.12	1.33	270.6	18.02	18.1	18.4
M	22	XE-138		517.81	258.76	1.33	575.1	9.14	38.8	9.'
M	23			538.92	269.31	1.34	670.7	7.63	47.3	8.(
M	24			543.21	271.45	1.34	546.4	8.87	38.8	9.(
M	25			549.86	274.78	1.34	284.1	16.72	20.5	17.1
	26	PB-214		590.79	295.24	1.40	15060.3	0.90	1174.8	3.(
	27			647.16	323.42	1.29	171.8	23.82	14.9	24.(
	28	PB-214		704.05	351.87	1.49	24376.5	0.68	2320.6	3.1
B	28				351.87		14.7	11.12		
M	29	KR-87		804.26	401.98	1.47	172.1	21.42	19.1	21.(
M	30	I-134		810.89	405.29	1.47	226.5	16.57	25.4	16.(
	31			961.43	480.59	1.57	189.2	16.29	25.7	16.(
	32	TE-129		974.10	486.93	1.64	214.5	14.67	29.6	15.(
	33			1152.31	576.08	1.17	16.4	172.69	2.7	172.7
	34	BI-214		1218.59	609.25	1.73	16615.1	0.81	2941.0	3.(
B	34				609.25		25.6	6.05		
	35	CE-143		1330.61	665.29	1.63	472.7	6.70	92.0	7.4
	36	NB-94		1406.60	703.32	2.04	139.6	17.66	28.8	17.9
	37			1439.52	719.79	1.96	126.8	19.17	26.8	19.4
	38			1484.72	742.41	2.04	103.2	22.66	22.6	22.(
	39			1536.59	768.37	1.91	1450.9	3.12	328.7	4.2
B	39				768.37		3.4	33.57		
	40	BI-212		1571.99	786.08	2.10	317.2	8.78	73.6	9.2
	41			1612.21	806.21	2.05	404.8	7.38	96.4	7.(
	42			1677.97	839.11	1.98	161.8	15.30	40.1	15.(
	43	Y-92		1867.80	934.10	1.94	770.7	4.73	213.2	5.(

	44	NATURAL	2001.67	1001.08	2.17	202.9	12.12	60.2	12.
	45		2035.17	1017.84	1.54	24.2	89.58	7.3	89.
	46		2139.34	1069.96	2.27	92.9	22.52	29.5	22.
	47	BI-214	2239.99	1120.31	2.30	3019.3	2.01	1002.8	3.
B	47			1120.31		11.3	10.06		
	48		2309.53	1155.09	2.53	335.7	7.95	115.0	8.
	49		2414.78	1207.72	2.34	76.9	25.04	27.5	25.
	50	BI-214 CO-56	2475.75	1238.21	2.59	1064.4	3.70	391.0	4.
B	50			1238.21		4.3	22.37		
	51		2561.09	1280.88	2.49	275.5	8.80	104.7	9.
M	52	BI-214	2754.70	1377.66	2.39	703.0	4.59	287.9	5.
M	53		2769.89	1385.25	2.39	122.8	16.39	50.6	16.
M	54		2801.85	1401.22	2.41	214.0	10.45	89.2	10.
M	55	EU-152	2815.09	1407.84	2.41	369.0	6.91	154.5	7.
	56	NATURAL	2921.34	1460.92	2.70	174.8	12.30	76.1	12.
B	56			1460.92		155.7	1.70		
	57		3017.79	1509.10	2.58	345.0	7.47	155.4	8.
	58		3167.07	1583.64	2.97	104.1	17.25	49.3	17.
	59		3322.12	1661.03	2.84	137.8	12.85	68.8	13.
	60		3458.55	1729.09	2.87	404.4	5.98	211.1	6.
	61	BI-214	3528.09	1763.77	2.84	2119.4	2.30	1131.2	4.
B	61			1763.77		11.2	7.16		
	62		3693.95	1846.44	3.70	280.1	7.16	157.5	8.

M - Peak is a multiplet
? - Poor goodness-of-fit value.
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0004.MC2
ackground description: 25K SEC BKG 4/21/97

*** R A D I O N U C L I D E R E P O R T *** 18-NOV-97 08:23:57

mple description :URANIUM ROCK 2
alyzed by :ELM

number	nuclide	conf.value	Activity (uCi/EA) measured	decay corrected
1. Fission gases				
1	KR-87	0.6099	1.12E-03 +-2.43E-04	1.49E-03 +-3.23E-04
5	XE-133	0.9899	2.19E-03 +-3.77E-04	2.20E-03 +-3.78E-04
		total	3.32E-03	total 3.69E-03
2. Iodines				
		total	0.00E+00	total 0.00E+00
3. Particulates				
2	Y-92	0.2766	4.26E-02 +-2.28E-03	4.72E-02 +-2.52E-03
3	NB-94	0.1093	7.80E-04 +-1.40E-04	7.80E-04 +-1.40E-04
4	NB-95M	0.9951	3.85E-03 +-4.09E-04	3.86E-03 +-4.11E-04
6	EU-155 ?	0.3104	1.26E-02 +-7.38E-04	1.26E-02 +-7.38E-04
7	NP-237 ?	0.6386	3.39E-02 +-1.99E-03	3.39E-02 +-1.99E-03
		total	9.37E-02	total 9.83E-02

= nuclides with a common single line, cannot identify which one is present

These peaks were not identified

number	channel	energy	peak intensity (gps)	
1	106.4	53.21	3.5558E+01 +-1.41E+01	NATURAL
2	126.6	63.27	1.4661E+02 +-3.14E+01	NATURAL
3	145.5	72.71	9.7238E+01 +-1.32E+01	NATURAL
4	149.6	74.80	4.1815E+02 +-4.64E+01	PB-214 NATURAL
5	154.4	77.18	4.5608E+02 +-4.38E+01	PB-214
6	159.0	79.48	2.3407E+01 +-4.76E+00	AG-108M CE-144 I-131
8	168.5	84.20	9.5061E+01 +-7.35E+00	NATURAL
10	179.6	89.78	5.0599E+01 +-4.24E+00	
11	185.3	92.59	2.8476E+02 +-1.25E+01	NATURAL
12	189.7	94.83	6.1966E+01 +-4.32E+00	
13	196.9	98.39	8.8702E+01 +-4.79E+00	
14	287.8	143.80	4.3226E+01 +-3.35E+00	NATURAL
15	308.5	154.17	2.1170E+01 +-2.88E+00	XE-138
16	326.3	163.07	1.7834E+01 +-2.87E+00	BA-140 NATURAL
17	372.1	185.95	4.0895E+02 +-1.69E+01	NATURAL NATURAL
18	411.1	205.44	1.8436E+01 +-3.13E+00	
20	484.2	241.94	4.4065E+02 +-1.94E+01	
21	512.5	256.12	1.8068E+01 +-3.34E+00	
22	517.8	258.76	3.8815E+01 +-3.88E+00	XE-138
23	538.9	269.31	4.7266E+01 +-4.05E+00	
24	543.2	271.45	3.8844E+01 +-3.76E+00	
25	549.9	274.78	2.0470E+01 +-3.51E+00	
26	590.8	295.24	1.1748E+03 +-4.32E+01	PB-214

27	647.2	323.42	1.4855E+01	+-3.57E+00		
28	704.0	351.87	2.3192E+03	+-7.34E+01	PB-214	
30	810.9	405.29	2.5361E+01	+-4.28E+00	I-134	
31	961.4	480.59	2.5739E+01	+-4.28E+00		
32	974.1	486.93	2.9605E+01	+-4.46E+00	TE-129	
33	1152.3	576.08	2.7233E+00	+-4.70E+00		
34	1218.6	609.25	2.9365E+03	+-1.05E+02	BI-214	
35	1330.6	665.29	9.2004E+01	+-6.87E+00	CE-143	
37	1439.5	719.79	2.6832E+01	+-5.21E+00		
38	1484.7	742.41	2.2564E+01	+-5.16E+00		
39	1536.6	768.37	3.2790E+02	+-1.39E+01		
40	1572.0	786.08	7.3573E+01	+-6.78E+00	BI-212	
41	1612.2	806.21	9.6389E+01	+-7.58E+00		
42	1678.0	839.11	4.0128E+01	+-6.23E+00		
44	2001.7	1001.08	6.0182E+01	+-7.45E+00	NATURAL	
45	2035.2	1017.84	7.3108E+00	+-6.55E+00		
46	2139.3	1069.96	2.9473E+01	+-6.68E+00		
47	2240.0	1120.31	9.9907E+02	+-3.39E+01	BI-214	
48	2309.5	1155.09	1.1498E+02	+-9.69E+00		
49	2414.8	1207.72	2.7549E+01	+-6.94E+00		
50	2475.7	1238.21	3.8940E+02	+-1.85E+01	BI-214	CO-56
51	2561.1	1280.88	1.0474E+02	+-9.73E+00		
52	2754.7	1377.66	2.8787E+02	+-1.58E+01	BI-214	
53	2769.9	1385.25	5.0587E+01	+-8.43E+00		
54	2801.9	1401.22	8.9195E+01	+-9.70E+00		
55	2815.1	1407.84	1.5453E+02	+-1.16E+01	EU-152	
56	3017.8	1509.10	1.5538E+02	+-1.25E+01		
57	3167.1	1583.64	4.9334E+01	+-8.63E+00		
58	3322.1	1661.03	6.8802E+01	+-9.08E+00		
59	3458.5	1729.09	2.1110E+02	+-1.44E+01		
60	3528.1	1763.77	1.1252E+03	+-4.72E+01	BI-214	
61	3694.0	1846.44	1.5751E+02	+-1.31E+01		

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 18-NOV-97 08:23:57

ample description :URANIUM ROCK 2
Analyzed by :ELM

		MDA (uCi/EA) measured	decay corrected
NA-24	: MDA :	1.34E-03	1.37E-03
AR-41	: MDA :	1.24E-03	1.51E-03
CR-51	: MDA :	7.09E-03	7.09E-03
MN-54	: MDA :	1.16E-03	1.16E-03
MN-56	: MDA :	1.16E-03	1.33E-03
CO-57	: MDA :	5.56E-04	5.56E-04
CO-58	: MDA :	1.22E-03	1.22E-03
FE-59	: MDA :	2.26E-03	2.26E-03
CO-60	: MDA :	1.29E-03	1.29E-03
CU-64	: MDA :	2.71E-01	2.79E-01
NI-65	: MDA :	6.36E-03	7.33E-03
ZN-65	: MDA :	4.01E-03	4.01E-03
SE-75	: MDA :	8.84E-04	8.84E-04
BR-84	: MDA :	2.85E-03	5.62E-03
KR-85	: MDA :	1.96E-01	1.96E-01
SR-85	: MDA :	8.59E-04	8.59E-04
?R-85M	: MDA :	7.40E-04	8.02E-04
?-88	: MDA :	2.30E-03	2.61E-03
-88	: MDA :	1.07E-03	1.07E-03
RB-88	: MDA :	4.96E-03	1.67E-02
RB-89	: MDA :	2.06E-03	8.37E-03
KR-89	: MDA :	1.13E-02	1.06E+01
Y-91M	: MDA :	9.23E-04	1.43E-03
SR-91	: MDA :	3.68E-03	3.82E-03
SR-92	: MDA :	2.27E-03	2.59E-03
Y-93	: MDA :	1.01E-02	1.05E-02
Y-94	: MDA :	2.06E-03	6.56E-03
Y-95	: MDA :	6.64E-03	5.43E-02
NB-95	: MDA :	1.53E-03	1.53E-03
ZR-95	: MDA :	1.88E-03	1.88E-03
ZR-97	: MDA :	1.57E-02	1.61E-02
NB-97	: MDA :	8.88E-04	1.20E-03
MO-99	: MDA :	8.13E-03	8.17E-03
TC-99M	: MDA :	6.88E-04	6.91E-04
MO-101	: MDA :	3.06E-03	1.35E-02
TC-101	: MDA :	7.68E-04	3.53E-03
TC-102M	: MDA :	2.63E-03	3.81E-01
RU-103	: MDA :	8.74E-04	8.74E-04
TC-104	: MDA :	1.07E-03	3.55E-03
RH-105	: MDA :	3.58E-03	3.61E-03
RU-105	: MDA :	1.96E-03	2.12E-03
RH-106	: MDA :	8.85E-03	8.85E-03
U-106	: MDA :	8.85E-03	8.85E-03
)-108M	: MDA :	8.87E-04	8.87E-04
CD-109	: MDA :	2.31E-02	2.31E-02
AG-110M	: MDA :	9.28E-04	9.28E-04
SN-113	: MDA :	1.32E-03	1.32E-03

SB-122	MDA	1.27E-03	1.28E-03
SB-124	MDA	1.18E-03	1.18E-03
SB-125	MDA	2.98E-03	2.98E-03
[illegible]-131M	MDA	3.92E-03	3.96E-03
-131M	MDA	2.87E-02	2.88E-02
-131	MDA	2.59E-03	6.62E-03
131	MDA	8.83E-04	8.85E-04
TE-131	MDA	7.93E-04	1.88E-03
I-132	MDA	1.05E-03	1.23E-03
TE-132	MDA	6.85E-04	6.88E-04
BA-133	MDA	2.69E-03	2.69E-03
TE-133	MDA	9.49E-04	5.40E-03
I-133	MDA	9.35E-04	9.51E-04
XE-133M	MDA	6.09E-03	6.13E-03
TE-133M	MDA	1.37E-03	2.03E-03
TE-134	MDA	2.69E-03	4.52E-03
I-134	MDA	1.18E-03	1.78E-03
CS-134	MDA	1.20E-03	1.20E-03
I-135	MDA	4.42E-03	4.67E-03
XE-135M	MDA	9.78E-04	4.00E-03
XE-135	MDA	6.68E-04	6.95E-04
CS-136	MDA	1.07E-03	1.08E-03
CS-137	MDA	1.19E-03	1.19E-03
CS-138	MDA	1.89E-03	3.70E-03
XE-138	MDA	2.09E-03	9.68E-03
CS-139	MDA	2.11E-02	2.11E-01
BA-139	MDA	3.32E-03	4.31E-03
CS-138M	MDA	1.22E-02	2.12E+01
CE-139	MDA	7.07E-04	7.07E-04
BA-140	MDA	3.48E-03	3.49E-03
-140	MDA	1.56E-03	1.56E-03
[illegible]A-141	MDA	1.56E-03	5.11E-03
LA-141	MDA	5.08E-02	5.57E-02
CE-141	MDA	1.16E-03	1.16E-03
BA-142	MDA	3.49E-03	2.64E-02
LA-142	MDA	1.63E-03	2.04E-03
CE-143	MDA	3.31E-03	3.35E-03
PR-144	MDA	6.73E-02	6.73E-02
CE-144	MDA	4.80E-03	4.80E-03
PR-146	MDA	1.65E-03	4.07E-03
CE-146	MDA	1.29E-03	6.13E-03
ND-147	MDA	3.06E-03	3.07E-03
PR-147	MDA	3.06E-03	1.50E-02
PM-149	MDA	2.45E-02	2.46E-02
EU-152	MDA	1.66E-03	1.66E-03
HF-181	MDA	9.68E-04	9.69E-04
W-187	MDA	3.41E-03	3.46E-03
HG-203	MDA	8.45E-04	8.46E-04
NP-237	MDA	6.81E-03	6.81E-03
U-237	MDA	2.21E-03	2.21E-03
NP-239	MDA	2.20E-03	2.21E-03
AM-241	MDA	3.16E-03	3.16E-03
EU-154	MDA	1.17E-03	1.17E-03
EU-155	MDA	2.44E-03	2.44E-03

GAMMA SPECTRUM ANALYSIS

..NBERRA APOGEE V2.4

Canberra Industries, Inc. 18-NOV-97 11:20:45

ANALYSIS PARAMETERS

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 2	ADC unit number	: 4.0
Detector number	: 4	Geometry number	: 6
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 0.8	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
GRA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : ROCK Analyzed by: SLC

mple size : 1.000000E+00 EA Conv. factor : 1.000
..andard size : 1.000000E+00 EA

Sample taken on : 18-NOV-97 at 10:28:23
Collect started on : 18-NOV-97 at 10:28:23
Decay time : 0.0 minutes

live time : 3000.0 seconds real time : 3031.0 seconds
dead time : 1.02 %

Energy calibration used done on 11 / 18 / 1997
Efficiency calibration used done on 11 / 9 / 1996

*** P E A K F I T R E P O R T *** 18-NOV-97 11:20:45

peak no.		nuclide(s)		centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	err %
Peak at 36.53 keV dropped from analysis due to negative area										
	1	NATURAL		126.58	63.29	1.13	4273.9	3.04	98.3	21.2
?M	2	NATURAL		145.47	72.72	1.14	5388.4	2.68	99.2	12.7
B	2				72.72		96.3	7.92		
?M	3	PB-214	NATURAL	149.67	74.82	1.14	19490.2	0.96	345.0	11.(
B	3				74.82		197.8	4.42		
?M	4	PB-214		154.39	77.18	1.14	18799.1	1.00	319.6	9.5
?M	5	AG-108M	CE-144	159.00	79.48	1.15	880.2	14.27	14.4	16.4
		I-131	TL-201							
?M	6	BA-133	XE-133	162.38	81.17	1.15	872.5	15.49	14.0	17.1
?M	7	NATURAL		168.59	84.26	1.15	5455.6	2.60	83.8	6.6
B	7				84.26		90.0	9.11		
?M	8	NP-237	EU-155	174.52	87.23	1.16	7639.3	1.85	116.4	5.4
		NATURAL								
?M	9			179.75	89.84	1.16	2681.2	4.45	38.8	6.3
?M	10	NATURAL		185.24	92.58	1.16	13518.8	1.20	190.6	4.2
?M	11			190.00	94.96	1.16	2204.7	5.46	30.5	6.6
	12			196.87	98.39	1.21	4154.2	2.93	56.1	4.7
	13			221.95	110.92	1.40	865.7	12.23	11.0	12.9
	14	NATURAL		287.93	143.88	1.32	2649.6	4.20	33.9	5.5
	15	XE-138		308.69	154.25	1.20	1075.4	9.84	14.2	10.5
	16	BA-140	NATURAL	326.43	163.12	1.07	602.6	16.42	8.2	16.9
	17	NATURAL	NATURAL	372.18	185.98	1.35	21053.8	0.86	321.1	3.9
	18			410.82	205.28	1.36	888.7	10.32	14.9	11.(
	19	I-134		472.18	235.95	1.32	1534.6	5.86	29.5	7.2
	20			484.20	241.96	1.35	17819.6	0.91	351.3	4.2
M	21			512.66	256.18	1.33	752.8	10.35	15.8	11.1
M	22	XE-138		518.04	258.87	1.33	1408.0	5.86	29.8	7.0
M	23			539.12	269.41	1.34	1503.5	5.42	33.2	6.6
M	24			543.00	271.35	1.34	1310.3	5.92	29.2	7.(
M	25			549.35	274.52	1.34	839.9	9.01	18.9	9.1
M	26	PB-214		590.79	295.24	1.36	36695.6	0.57	895.9	3.6
M	27	NATURAL		600.43	300.06	1.37	384.5	18.40	9.6	18.7
	28			647.83	323.76	1.21	409.6	15.97	11.1	16.(
	29			660.30	329.99	1.14	370.1	17.63	10.2	17.9
	30	NATURAL		676.98	338.33	1.00	288.5	22.46	8.2	22.6
	31	PB-214		704.06	351.87	1.47	61144.6	0.43	1816.6	3.1
B	31				351.87		44.1	11.12		
	32			778.03	388.86	1.39	537.4	11.27	17.9	11.6
M	33			803.67	401.69	1.47	545.8	10.96	18.8	11.4
M	34	I-134		810.81	405.26	1.47	487.1	12.21	17.0	12.6
	35	XE-137		910.29	455.01	1.35	327.2	15.28	13.0	15.6
	36			939.32	469.53	1.74	225.1	21.32	9.3	21.5
	37			961.05	480.40	1.57	314.5	15.12	13.3	15.5
	38	TE-129		974.05	486.90	1.71	375.7	12.72	16.2	13.1
M	39			1003.03	501.40	1.57	93.7	44.39	4.2	44.5
M	40	ANN-RD		1021.96	510.87	3.16	1190.7	5.55	54.1	6.5
B	40				510.87		108.3	5.57		
	41			1160.31	580.08	1.43	385.1	11.83	20.2	12.(
	42	BI-214		1218.63	609.27	1.73	42682.0	0.51	2362.0	3.5
B	42				609.27		76.8	6.05		
	43			1330.89	665.44	1.80	1313.5	3.94	80.1	5.1

	44	NB-94		1406.18	703.11	1.42	413.8	9.67	26.8	10.1
	45			1439.36	719.71	1.73	327.8	11.60	21.8	12.0
	46	ZR-97		1485.14	742.62	1.87	351.0	10.92	24.1	11.3
	47			1536.64	768.39	1.90	3700.3	1.96	264.1	3.4
B	47				768.39		10.1	33.57		
	48	BI-212		1571.51	785.84	2.01	854.1	5.37	62.5	6.0
	49			1612.32	806.26	1.97	879.4	5.22	66.1	5.8
M	50			1664.15	832.20	1.89	186.7	19.52	14.5	19.7
M	51			1677.87	839.06	1.89	391.3	10.08	30.7	10.4
	52	Y-92		1867.87	934.13	2.12	1947.7	2.99	171.2	3.8
	53	EU-152		1928.15	964.29	2.03	201.9	17.58	18.3	17.7
	54	NATURAL		2001.50	1001.00	2.57	628.8	6.50	59.4	6.9
	55			2104.36	1052.46	2.25	197.4	17.05	19.7	17.2
	56	BI-214		2240.09	1120.35	2.24	7920.4	1.24	840.9	2.9
B	56				1120.35		33.9	10.06		
	57			2309.60	1155.12	2.71	825.6	5.07	90.4	5.7
	58			2414.83	1207.75	1.98	208.8	15.15	23.9	15.4
	59	BI-214	CO-56	2475.62	1238.15	2.32	2707.9	2.30	318.5	3.7
B	59				1238.15		12.9	22.37		
	60			2506.85	1253.76	2.44	119.5	24.31	14.2	24.4
	61			2561.19	1280.93	2.29	630.1	5.91	76.7	6.8
M	62	BI-214		2754.66	1377.64	2.39	1891.5	2.80	248.1	4.1
M	63			2770.17	1385.40	2.39	343.5	9.46	45.3	9.9
M	64			2801.86	1401.23	2.41	587.1	6.09	78.3	6.7
M	65	EU-152		2815.48	1408.03	2.41	1122.7	3.90	150.5	4.9
	66	NATURAL		2921.35	1460.93	2.70	592.4	6.28	82.5	6.9
B	66				1460.93		467.2	1.70		
	67			3017.71	1509.06	2.60	845.8	5.02	121.7	5.8
	68			3165.92	1583.07	3.21	268.4	10.45	40.5	10.8
	69			3321.57	1660.75	2.96	372.9	7.50	59.2	8.0
M	70			3367.15	1683.50	2.65	89.6	21.74	14.4	21.9
M	71			3385.60	1692.70	2.66	141.3	14.03	22.9	14.3
	72			3458.53	1729.08	2.70	1042.9	3.67	172.5	4.9
	73	BI-214		3528.42	1763.93	2.85	5366.2	1.44	905.8	3.7
B	73				1763.93		33.7	7.16		
M	74			3676.09	1837.54	2.79	158.9	12.75	28.0	13.3
M	75			3694.05	1846.49	2.79	688.0	4.51	121.7	6.1
	76			3831.53	1914.98	2.35	13.3	122.57	2.4	122.6

M - Peak is a multiplet
? - Poor goodness-of-fit value.
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0004.MC2
background description: 25K SEC BKG 4/21/97

*** R A D I O N U C L I D E R E P O R T *** 18-NOV-97 11:20:45

mple description :ROCK
alyzed by :SLC

number	nuclide	conf.value	Activity (uCi/EA) measured		decay corrected	
1. Fission gases						
4	XE-133	0.9943	1.03E-03	+-1.77E-04	1.03E-03	+-1.77E-04
		total	1.03E-03	total	1.03E-03	
2. Iodines						
		total	0.00E+00	total	0.00E+00	
3. Particulates						
1	Y-92	0.2813	3.61E-02	+-1.40E-03	3.61E-02	+-1.40E-03
2	NB-94	0.1551	7.26E-04	+-7.39E-05	7.26E-04	+-7.39E-05
3	NB-95M	0.9864	3.20E-03	+-2.30E-04	3.20E-03	+-2.30E-04
5	EU-155 ?	0.3072	9.25E-03	+-5.04E-04	9.25E-03	+-5.04E-04
6	NP-237 ?	0.6353	2.50E-02	+-1.36E-03	2.50E-02	+-1.36E-03
		total	7.42E-02	total	7.42E-02	

= nuclides with a common single line, cannot identify which one is present

These peaks were not identified

number	channel	energy	peak intensity (cps)		
1	126.6	63.29	9.8276E+01	+-2.08E+01	NATURAL
2	145.5	72.72	9.7438E+01	+-1.24E+01	NATURAL
3	149.7	74.82	3.4153E+02	+-3.76E+01	PB-214 NATURAL
4	154.4	77.18	3.1960E+02	+-3.05E+01	PB-214
5	159.0	79.48	1.4434E+01	+-2.38E+00	AG-108M CE-144 I-131
7	168.6	84.26	8.2450E+01	+-5.48E+00	NATURAL
9	179.8	89.84	3.8760E+01	+-2.45E+00	
10	185.2	92.58	1.9061E+02	+-8.03E+00	NATURAL
11	190.0	94.96	3.0493E+01	+-2.03E+00	
12	196.9	98.39	5.6089E+01	+-2.65E+00	
13	222.0	110.92	1.1038E+01	+-1.43E+00	
14	287.9	143.88	3.3931E+01	+-1.88E+00	NATURAL
15	308.7	154.25	1.4205E+01	+-1.49E+00	XE-138
16	326.4	163.12	8.2353E+00	+-1.40E+00	BA-140 NATURAL
17	372.2	185.98	3.2112E+02	+-1.28E+01	NATURAL NATURAL
18	410.8	205.28	1.4859E+01	+-1.65E+00	
20	484.2	241.96	3.5130E+02	+-1.50E+01	
21	512.7	256.18	1.5760E+01	+-1.75E+00	
22	518.0	258.87	2.9805E+01	+-2.12E+00	XE-138
23	539.1	269.41	3.3216E+01	+-2.22E+00	
24	543.0	271.35	2.9173E+01	+-2.06E+00	
25	549.3	274.52	1.8936E+01	+-1.85E+00	
26	590.8	295.24	8.9586E+02	+-3.23E+01	PB-214
27	600.4	300.06	9.5551E+00	+-1.79E+00	NATURAL

28	647.8	323.76	1.1080E+01	+-1.81E+00	
29	660.3	329.99	1.0226E+01	+-1.83E+00	
30	677.0	338.33	8.1995E+00	+-1.86E+00	NATURAL
31	704.1	351.87	1.8153E+03	+-5.66E+01	PB-214
32	778.0	388.86	1.7887E+01	+-2.09E+00	
33	803.7	401.69	1.8847E+01	+-2.15E+00	
34	810.8	405.26	1.6994E+01	+-2.14E+00	I-134
35	910.3	455.01	1.3023E+01	+-2.04E+00	XE-137
36	939.3	469.53	9.2888E+00	+-2.01E+00	
37	961.0	480.40	1.3317E+01	+-2.06E+00	
38	974.1	486.90	1.6152E+01	+-2.13E+00	TE-129
39	1003.0	501.40	4.1632E+00	+-1.85E+00	
40	1022.0	510.87	4.9146E+01	+-3.47E+00	ANN-RD
41	1160.3	580.08	2.0175E+01	+-2.49E+00	
42	1218.6	609.27	2.3578E+03	+-8.27E+01	BI-214
43	1330.9	665.44	8.0145E+01	+-4.12E+00	
45	1439.4	719.71	2.1797E+01	+-2.62E+00	
46	1485.1	742.62	2.4150E+01	+-2.73E+00	ZR-97
47	1536.6	768.39	2.6341E+02	+-9.17E+00	
48	1571.5	785.84	6.2462E+01	+-3.78E+00	BI-212
49	1612.3	806.26	6.6104E+01	+-3.89E+00	
50	1664.2	832.20	1.4522E+01	+-2.86E+00	
51	1677.9	839.06	3.0696E+01	+-3.20E+00	
53	1928.1	964.29	1.8346E+01	+-3.26E+00	EU-152
54	2001.5	1001.00	5.9407E+01	+-4.14E+00	NATURAL
55	2104.4	1052.46	1.9652E+01	+-3.39E+00	
56	2240.1	1120.35	8.3731E+02	+-2.50E+01	BI-214
57	2309.6	1155.12	9.0450E+01	+-5.23E+00	
58	2414.8	1207.75	2.3946E+01	+-3.69E+00	
59	2475.6	1238.15	3.1702E+02	+-1.18E+01	BI-214 CO-56
60	2506.8	1253.76	1.4238E+01	+-3.49E+00	
61	2561.2	1280.93	7.6739E+01	+-5.08E+00	
62	2754.7	1377.64	2.4806E+02	+-1.02E+01	BI-214
63	2770.2	1385.40	4.5305E+01	+-4.50E+00	
64	2801.9	1401.23	7.8334E+01	+-5.32E+00	
65	2815.5	1408.03	1.5054E+02	+-7.41E+00	EU-152
66	2921.3	1460.93	1.7433E+01	+-5.32E+00	NATURAL
67	3017.7	1509.06	1.2170E+02	+-7.09E+00	
68	3165.9	1583.07	4.0548E+01	+-4.40E+00	
69	3321.6	1660.75	5.9160E+01	+-4.78E+00	
70	3367.2	1683.50	1.4417E+01	+-3.17E+00	
71	3385.6	1692.70	2.2854E+01	+-3.28E+00	
72	3458.5	1729.08	1.7247E+02	+-8.50E+00	
73	3528.4	1763.93	9.0011E+02	+-3.41E+01	BI-214
74	3676.1	1837.54	2.7982E+01	+-3.75E+00	
75	3694.0	1846.49	1.2175E+02	+-7.50E+00	
76	3831.5	1914.98	2.4472E+00	+-3.00E+00	

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 18-NOV-97 11:20:45

ample description :ROCK
Analyzed by :SLC

	MDA (uCi/EA)	
	measured	decay corrected
NA-24 :	MDA : 6.97E-04	6.97E-04
AR-41 :	MDA : 6.33E-04	6.33E-04
CR-51 :	MDA : 3.56E-03	3.56E-03
MN-54 :	MDA : 5.89E-04	5.89E-04
MN-56 :	MDA : 5.80E-04	5.80E-04
CO-57 :	MDA : 2.71E-04	2.71E-04
CO-58 :	MDA : 5.96E-04	5.96E-04
FE-59 :	MDA : 1.17E-03	1.17E-03
CO-60 :	MDA : 6.58E-04	6.58E-04
CU-64 :	MDA : 1.37E-01	1.37E-01
NI-65 :	MDA : 3.31E-03	3.31E-03
ZN-65 :	MDA : 2.04E-03	2.04E-03
SE-75 :	MDA : 4.29E-04	4.29E-04
BR-84 :	MDA : 1.40E-03	1.40E-03
KR-85 :	MDA : 9.88E-02	9.88E-02
SR-85 :	MDA : 4.32E-04	4.32E-04
KR-85M :	MDA : 3.62E-04	3.62E-04
R-87 :	MDA : 8.76E-04	8.76E-04
R-88 :	MDA : 1.15E-03	1.15E-03
Y-88 :	MDA : 5.33E-04	5.33E-04
RB-88 :	MDA : 5.66E-03	5.66E-03
RB-89 :	MDA : 2.70E-03	2.70E-03
KR-89 :	MDA : 1.65E-02	1.65E-02
Y-91M :	MDA : 4.60E-04	4.60E-04
SR-91 :	MDA : 1.91E-03	1.91E-03
SR-92 :	MDA : 1.16E-03	1.16E-03
Y-93 :	MDA : 5.03E-03	5.03E-03
Y-94 :	MDA : 2.36E-03	2.36E-03
Y-95 :	MDA : 1.15E-02	1.15E-02
NB-95 :	MDA : 7.68E-04	7.68E-04
ZR-95 :	MDA : 9.08E-04	9.08E-04
ZR-97 :	MDA : 7.89E-03	7.89E-03
NB-97 :	MDA : 4.36E-04	4.36E-04
MO-99 :	MDA : 4.10E-03	4.10E-03
TC-99M :	MDA : 3.36E-04	3.36E-04
MO-101 :	MDA : 4.04E-03	4.04E-03
TC-101 :	MDA : 1.05E-03	1.05E-03
TC-102M :	MDA : 3.76E-03	3.76E-03
RU-103 :	MDA : 4.22E-04	4.22E-04
TC-104 :	MDA : 1.20E-03	1.20E-03
RH-105 :	MDA : 1.82E-03	1.82E-03
RU-105 :	MDA : 9.99E-04	9.99E-04
H-106 :	MDA : 4.31E-03	4.31E-03
-106 :	MDA : 4.31E-03	4.31E-03
AG-108M :	MDA : 4.45E-04	4.45E-04
CD-109 :	MDA : 1.12E-02	1.12E-02
AG-110M :	MDA : 4.53E-04	4.53E-04

SN-113	MDA	6.52E-04	6.52E-04
SB-122	MDA	6.31E-04	6.31E-04
SB-124	MDA	5.79E-04	5.79E-04
[illegible]-125	MDA	1.47E-03	1.47E-03
-131M	MDA	1.94E-03	1.94E-03
[illegible]-131M	MDA	1.42E-02	1.42E-02
[illegible]-131	MDA	2.49E-03	2.49E-03
I-131	MDA	4.44E-04	4.44E-04
TE-131	MDA	7.24E-04	7.24E-04
I-132	MDA	5.29E-04	5.29E-04
TE-132	MDA	3.41E-04	3.41E-04
BA-133	MDA	1.27E-03	1.27E-03
TE-133	MDA	1.46E-03	1.46E-03
I-133	MDA	4.69E-04	4.69E-04
XE-133M	MDA	3.04E-03	3.04E-03
TE-133M	MDA	6.97E-04	6.97E-04
TE-134	MDA	1.35E-03	1.35E-03
I-134	MDA	5.94E-04	5.94E-04
CS-134	MDA	6.13E-04	6.13E-04
I-135	MDA	2.35E-03	2.35E-03
XE-135M	MDA	1.24E-03	1.24E-03
XE-135	MDA	3.36E-04	3.36E-04
CS-136	MDA	5.37E-04	5.37E-04
CS-137	MDA	5.94E-04	5.94E-04
CS-138	MDA	9.87E-04	9.87E-04
XE-138	MDA	2.84E-03	2.84E-03
CS-139	MDA	4.11E-02	4.11E-02
BA-139	MDA	1.64E-03	1.64E-03
CS-138M	MDA	1.79E-02	1.79E-02
[illegible]E-139	MDA	3.50E-04	3.50E-04
[illegible]-140	MDA	1.74E-03	1.74E-03
[illegible]-140	MDA	7.92E-04	7.92E-04
BA-141	MDA	1.76E-03	1.76E-03
LA-141	MDA	2.56E-02	2.56E-02
CE-141	MDA	5.72E-04	5.72E-04
BA-142	MDA	5.98E-03	5.98E-03
LA-142	MDA	8.03E-04	8.03E-04
CE-143	MDA	1.63E-03	1.63E-03
PR-144	MDA	3.41E-02	3.41E-02
CE-144	MDA	2.34E-03	2.34E-03
PR-146	MDA	1.56E-03	1.56E-03
CE-146	MDA	1.81E-03	1.81E-03
ND-147	MDA	1.45E-03	1.45E-03
PR-147	MDA	4.39E-03	4.39E-03
PM-149	MDA	1.23E-02	1.23E-02
EU-152	MDA	8.15E-04	8.15E-04
HF-181	MDA	4.77E-04	4.77E-04
W-187	MDA	1.69E-03	1.69E-03
HG-203	MDA	4.24E-04	4.24E-04
NP-237	MDA	3.29E-03	3.29E-03
U-237	MDA	1.05E-03	1.05E-03
NP-239	MDA	1.07E-03	1.07E-03
AM-241	MDA	1.53E-03	1.53E-03
EU-154	MDA	5.73E-04	5.73E-04
EU-155	MDA	1.18E-03	1.18E-03

GAMMA SPECTRUM ANALYSIS

CANBERRA APOGEE V2.4

Canberra Industries, Inc. 18-NOV-97 12:36:41

ANALYSIS PARAMETERS

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 2	ADC unit number	: 4.0
Detector number	: 4	Geometry number	: 6
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 0.8	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
GRA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : ROCK Analyzed by: SLC

mple size : 1.000000E+00 EA Conv. factor : 1.000
tandard size : 1.000000E+00 EA

Sample taken on : 18-NOV-97 at 11:45:19
Collect started on : 18-NOV-97 at 11:45:19
Decay time : 0.0 minutes

live time : 3000.0 seconds real time : 3003.0 seconds
dead time : 0.10 %

Energy calibration used done on 11 / 18 / 1997
Efficiency calibration used done on 11 / 9 / 1996

*** P E A K F I T R E P O R T *** 18-NOV-97 12:36:41

	peak no.	nuclide(s)		centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	err %
	1	NATURAL		126.62	63.31	1.23	188.7	15.74	4.3	26.1
M	2	PB-214	NATURAL	149.78	74.87	1.14	570.2	6.62	10.1	12.7
B	2				74.87		197.8	4.42		
M	3	PB-214		154.37	77.16	1.14	405.1	8.79	6.9	12.9
	4	EU-155	NATURAL	174.75	87.34	0.98	95.7	32.55	1.4	32.9
		CD-109								
	5	NATURAL		185.18	92.55	1.30	472.2	7.69	6.7	8.6
	6	NATURAL	NATURAL	372.12	185.94	1.30	624.2	5.71	9.5	6.9
	7			484.43	242.07	1.27	363.5	7.94	7.2	8.9
	8	PB-214		590.88	295.28	1.42	811.2	4.34	19.8	5.6
	9	PB-214		704.07	351.88	1.43	1295.3	3.14	38.5	4.4
B	9				351.88		44.1	11.12		
	10	BI-214		1218.67	609.28	1.68	939.9	3.57	52.0	4.9
B	10				609.28		76.8	6.05		
	11			1330.85	665.41	1.40	22.0	63.47	1.3	63.5
	12			1536.42	768.28	1.94	81.3	16.84	5.8	17.6
B	12				768.28		10.1	33.57		
	13	BI-212		1572.06	786.11	1.78	32.6	34.77	2.4	34.8
	14	BI-214		2239.95	1120.28	2.06	134.0	11.93	14.2	12.2
B	14				1120.28		33.9	10.06		
	15	BI-214	CO-56	2474.92	1237.80	1.85	67.2	19.51	7.9	19.7
B	15				1237.80		12.9	22.37		
	16	NATURAL		2921.13	1460.82	2.57	490.2	4.93	68.2	5.7
B	16				1460.82		467.2	1.70		
	17			3527.93	1763.68	3.06	147.7	8.94	24.9	9.6
B	17				1763.68		33.7	7.16		

M - Peak is a multiplet
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0004.MCA
background description: 25K SEC BKG 4/21/97

*** R A D I O N U C L I D E R E P O R T *** 18-NOV-97 12:36:41

mple description :
alyzed by :SLC

number	nuclide	conf.value	Activity (uCi/EA) measured	decay corrected
1. Fission gases				
		total	0.00E+00	0.00E+00
2. Iodines				
		total	0.00E+00	0.00E+00
3. Particulates				
1	CD-109 ?	0.9087	1.07E-03 +-3.51E-04	1.07E-03 +-3.51E-04
2	EU-155 ?	0.2762	1.13E-04 +-3.72E-05	1.13E-04 +-3.72E-05
		total	1.18E-03	1.18E-03

? = nuclides with a common single line, cannot identify which one is present

These peaks were not identified

mber	channel	energy	peak intensity (gps)		
1	126.6	63.31	4.3375E+00 +-1.14E+00	NATURAL	
2	149.8	74.87	6.5867E+00 +-9.94E-01	PB-214	NATURAL
3	154.4	77.16	6.8879E+00 +-8.91E-01	PB-214	
5	185.2	92.55	6.6590E+00 +-5.79E-01	NATURAL	
6	372.1	185.94	9.5188E+00 +-6.58E-01	NATURAL	NATURAL
7	484.4	242.07	7.1698E+00 +-6.43E-01		
8	590.9	295.28	1.9806E+01 +-1.11E+00	PB-214	
9	704.1	351.88	3.7173E+01 +-1.67E+00	PB-214	
10	1218.7	609.28	4.7766E+01 +-2.50E+00	BI-214	
11	1330.8	665.41	1.3451E+00 +-8.55E-01		
12	1536.4	768.28	5.0775E+00 +-1.02E+00		
13	1572.1	786.11	2.3832E+00 +-8.31E-01	BI-212	
14	2239.9	1120.28	1.0629E+01 +-1.76E+00	BI-214	
15	2474.9	1237.80	6.3928E+00 +-1.59E+00	BI-214	CO-56
16	3527.9	1763.68	1.9245E+01 +-2.36E+00		

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 18-NOV-97 12:36:41

mple description :
Analyzed by :SLC

		MDA (uCi/EA) measured	decay corrected
NA-24	MDA	1.86E-04	1.86E-04
AR-41	MDA	1.82E-04	1.82E-04
CR-51	MDA	8.94E-04	8.94E-04
MN-54	MDA	1.66E-04	1.66E-04
MN-56	MDA	1.69E-04	1.69E-04
CO-57	MDA	7.27E-05	7.27E-05
CO-58	MDA	1.58E-04	1.58E-04
FE-59	MDA	3.39E-04	3.39E-04
CO-60	MDA	2.04E-04	2.04E-04
CU-64	MDA	3.85E-02	3.85E-02
NI-65	MDA	6.90E-04	6.90E-04
ZN-65	MDA	4.50E-04	4.50E-04
SE-75	MDA	1.13E-04	1.13E-04
BR-84	MDA	3.89E-04	3.89E-04
KR-85	MDA	2.89E-02	2.89E-02
SR-85	MDA	1.26E-04	1.26E-04
YR-85M	MDA	9.04E-05	9.04E-05
'-87	MDA	2.18E-04	2.18E-04
.-88	MDA	2.87E-04	2.87E-04
Y-88	MDA	1.48E-04	1.48E-04
RB-88	MDA	1.57E-03	1.57E-03
RB-89	MDA	7.91E-04	7.91E-04
KR-89	MDA	4.14E-03	4.14E-03
Y-91M	MDA	1.29E-04	1.29E-04
SR-91	MDA	5.70E-04	5.70E-04
Y-92	MDA	1.37E-03	1.37E-03
SR-92	MDA	2.36E-04	2.36E-04
Y-93	MDA	1.25E-03	1.25E-03
Y-94	MDA	7.17E-04	7.17E-04
Y-95	MDA	3.27E-03	3.27E-03
NB-95	MDA	1.76E-04	1.76E-04
NB-95M	MDA	3.26E-04	3.26E-04
ZR-95	MDA	2.83E-04	2.83E-04
ZR-97	MDA	2.30E-03	2.30E-03
NB-97	MDA	1.51E-04	1.51E-04
MO-99	MDA	1.15E-03	1.15E-03
TC-99M	MDA	8.44E-05	8.44E-05
MO-101	MDA	1.02E-03	1.02E-03
TC-101	MDA	2.76E-04	2.76E-04
TC-102M	MDA	1.02E-03	1.02E-03
RU-103	MDA	1.15E-04	1.15E-04
TC-104	MDA	2.70E-04	2.70E-04
H-105	MDA	4.60E-04	4.60E-04
-105	MDA	2.94E-04	2.94E-04
H-106	MDA	1.35E-03	1.35E-03
RU-106	MDA	1.35E-03	1.35E-03
AG-108M	MDA	1.14E-04	1.14E-04

CD-109	:	MDA	: 2.46E-03	2.46E-03
AG-110M	:	MDA	: 1.55E-04	1.55E-04
SN-113	:	MDA	: 1.68E-04	1.68E-04
SB-122	:	MDA	: 1.83E-04	1.83E-04
-124	:	MDA	: 1.40E-04	1.40E-04
-125	:	MDA	: 3.81E-04	3.81E-04
-131M	:	MDA	: 4.58E-04	4.58E-04
XE-131M	:	MDA	: 3.57E-03	3.57E-03
SB-131	:	MDA	: 7.48E-04	7.48E-04
I-131	:	MDA	: 1.20E-04	1.20E-04
TE-131	:	MDA	: 1.82E-04	1.82E-04
I-132	:	MDA	: 1.62E-04	1.62E-04
TE-132	:	MDA	: 8.64E-05	8.64E-05
BA-133	:	MDA	: 2.77E-04	2.77E-04
TE-133	:	MDA	: 3.74E-04	3.74E-04
I-133	:	MDA	: 1.31E-04	1.31E-04
XE-133M	:	MDA	: 7.58E-04	7.58E-04
XE-133	:	MDA	: 2.52E-04	2.52E-04
TE-133M	:	MDA	: 2.15E-04	2.15E-04
TE-134	:	MDA	: 3.45E-04	3.45E-04
I-134	:	MDA	: 1.74E-04	1.74E-04
CS-134	:	MDA	: 1.79E-04	1.79E-04
I-135	:	MDA	: 6.40E-04	6.40E-04
XE-135M	:	MDA	: 3.51E-04	3.51E-04
XE-135	:	MDA	: 8.50E-05	8.50E-05
CS-136	:	MDA	: 1.53E-04	1.53E-04
CS-137	:	MDA	: 1.84E-04	1.84E-04
CS-138	:	MDA	: 2.56E-04	2.56E-04
XE-138	:	MDA	: 6.85E-04	6.85E-04
CS-139	:	MDA	: 1.03E-02	1.03E-02
-139	:	MDA	: 4.13E-04	4.13E-04
-138M	:	MDA	: 4.47E-03	4.47E-03
CE-139	:	MDA	: 8.78E-05	8.78E-05
BA-140	:	MDA	: 4.75E-04	4.75E-04
LA-140	:	MDA	: 2.04E-04	2.04E-04
BA-141	:	MDA	: 3.91E-04	3.91E-04
LA-141	:	MDA	: 6.73E-03	6.73E-03
CE-141	:	MDA	: 1.41E-04	1.41E-04
BA-142	:	MDA	: 1.49E-03	1.49E-03
LA-142	:	MDA	: 2.48E-04	2.48E-04
CE-143	:	MDA	: 3.02E-04	3.02E-04
PR-144	:	MDA	: 1.07E-02	1.07E-02
CE-144	:	MDA	: 6.18E-04	6.18E-04
PR-146	:	MDA	: 4.30E-04	4.30E-04
CE-146	:	MDA	: 4.58E-04	4.58E-04
ND-147	:	MDA	: 3.21E-04	3.21E-04
PR-147	:	MDA	: 1.12E-03	1.12E-03
PM-149	:	MDA	: 3.06E-03	3.06E-03
EU-152	:	MDA	: 2.19E-04	2.19E-04
HF-181	:	MDA	: 1.37E-04	1.37E-04
W-187	:	MDA	: 4.96E-04	4.96E-04
HG-203	:	MDA	: 1.05E-04	1.05E-04
NP-237	:	MDA	: 7.23E-04	7.23E-04
U-237	:	MDA	: 2.55E-04	2.55E-04
NP-239	:	MDA	: 2.82E-04	2.82E-04
M-241	:	MDA	: 3.66E-04	3.66E-04
-154	:	MDA	: 1.53E-04	1.53E-04
J-155	:	MDA	: 2.68E-04	2.68E-04
NB-94	:	MDA	: 1.41E-04	1.41E-04

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* G A M M A S P E C T R U M A N A L Y S I S *

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CANBERRA APOGEE V2.4

Canberra Industries, Inc. 18-NOV-97 09:14:56

A N A L Y S I S P A R A M E T E R S

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 1	ADC unit number	: 2.0
Detector number	: 2	Geometry number	: 5
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 0.7	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
BRA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : VACUUM BAG Analyzed by: SLC

Sample size : 1.000000E+00 EA Conv. factor : 1.000
Standard size : 1.000000E+00 EA

Sample taken on : 18-NOV-97 at 08:00:00
Collect started on : 18-NOV-97 at 08:00:00
Decay time : 0.0 minutes

live time : 3000.0 seconds real time : 3000.0 seconds
dead time : 0.00 %

Energy calibration used done on 11 / 18 / 1997
Efficiency calibration used done on 11 / 8 / 1996

*** P E A K F I T R E P O R T *** 18-NOV-97 09:14:56

Peak no.		nuclide(s)	centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	error %
M	1	PB-214	154.66	77.07	1.06	62.3	17.97	1.2	20.35
M	2	AG-108M	158.94	79.21	1.06	19.8	40.31	0.4	41.17
	3		180.22	89.85	1.03	18.2	45.68	0.3	45.90
	4	NATURAL	477.32	238.49	1.39	54.6	17.54	1.0	18.03
B	4			238.49		8.2	19.62		
	5	PB-214	591.05	295.39	1.37	61.8	14.79	1.4	15.21
	6	PB-214	704.10	351.95	1.38	127.1	9.49	3.4	9.98
	7	BI-214	1218.36	609.26	1.58	169.7	7.96	7.4	8.69
	8	BI-214	2240.06	1120.38	1.72	34.2	19.46	2.6	19.64
	9	CO-60	2345.52	1173.12	1.75	64.4	13.21	5.1	13.51
	10	CO-60	2664.31	1332.52	1.88	64.5	13.19	5.7	13.53
	11	NATURAL	2920.38	1460.52	2.02	26.9	21.86	2.6	22.06
B	11			1460.52		4.6	19.43		
	12	BI-214	3528.28	1764.22	2.18	27.4	20.70	3.0	20.99

M - Peak is a multiplet
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0002.MCA
Background description: 25K LUB OIL BLK 11/1

*** R A D I O N U C L I D E R E P O R T *** 18-NOV-97 09:14:56

Sample description :VACUUM BAG
Analyzed by :SLC

number	nuclide	conf.value	Activity (uCi/EA) measured		decay corrected	
1. Fission gases						
		total	0.00E+00		total	0.00E+00
2. Iodines						
		total	0.00E+00		total	0.00E+00
3. Particulates						
1	CO-60	0.9968	1.45E-04	+-1.39E-05	1.45E-04	+-1.39E-05
		total	1.45E-04		total	1.45E-04

These peaks were not identified

number	channel	energy	peak intensity (gps)	
	154.7	77.07	1.1995E+00 +-2.44E-01	PB-214
	158.9	79.21	3.6956E-01 +-1.52E-01	AG-108M
3	180.2	89.85	3.0142E-01 +-1.38E-01	
4	477.3	238.49	8.9056E-01 +-1.90E-01	NATURAL
5	591.0	295.39	1.4071E+00 +-2.14E-01	PB-214
6	704.1	351.95	3.3620E+00 +-3.36E-01	PB-214
7	1218.4	609.26	7.3952E+00 +-6.42E-01	BI-214
8	2240.1	1120.38	2.5971E+00 +-5.10E-01	BI-214
11	2920.4	1460.52	2.1260E+00 +-5.70E-01	NATURAL
12	3528.3	1764.22	3.0451E+00 +-6.39E-01	BI-214

Errors quoted at 1.000 sigma (68.3%)

** M D A C A L C U L A T I O N R E P O R T *** 18-NOV-97 09:14:56

Sample description :VACUUM BAG
Analyzed by :SLC

		MDA (uCi/EA) measured	MDA (uCi/EA) decay corrected
NA-24	MDA	4.90E-05	4.90E-05
AR-41	MDA	3.90E-05	3.90E-05
CR-51	MDA	2.20E-04	2.20E-04
MN-54	MDA	4.37E-05	4.37E-05
MN-56	MDA	4.48E-05	4.48E-05
CO-57	MDA	2.06E-05	2.06E-05
CO-58	MDA	4.28E-05	4.28E-05
FE-59	MDA	7.81E-05	7.81E-05
CU-64	MDA	1.05E-02	1.05E-02
NI-65	MDA	1.45E-04	1.45E-04
ZN-65	MDA	1.15E-04	1.15E-04
SE-75	MDA	2.84E-05	2.84E-05
BR-84	MDA	9.86E-05	9.86E-05
KR-85	MDA	8.84E-03	8.84E-03
SR-85	MDA	3.87E-05	3.87E-05
KR-85M	MDA	2.34E-05	2.34E-05
I 7	MDA	5.52E-05	5.52E-05
KR-88	MDA	8.04E-05	8.04E-05
Y-88	MDA	2.90E-05	2.90E-05
RB-88	MDA	3.06E-04	3.06E-04
RB-89	MDA	1.55E-04	1.55E-04
KR-89	MDA	9.39E-04	9.39E-04
Y-91M	MDA	2.50E-05	2.50E-05
SR-91	MDA	1.34E-04	1.34E-04
Y-92	MDA	3.26E-04	3.26E-04
SR-92	MDA	5.83E-05	5.83E-05
Y-93	MDA	2.35E-04	2.35E-04
Y-94	MDA	1.51E-04	1.51E-04
Y-95	MDA	8.00E-04	8.00E-04
NB-95	MDA	4.94E-05	4.94E-05
NB-95M	MDA	9.12E-05	9.12E-05
ZR-95	MDA	6.88E-05	6.88E-05
ZR-97	MDA	6.93E-04	6.93E-04
NB-97	MDA	3.90E-05	3.90E-05
MO-99	MDA	2.53E-04	2.53E-04
TC-99M	MDA	2.26E-05	2.26E-05
MO-101	MDA	3.02E-04	3.02E-04
TC-101	MDA	6.55E-05	6.55E-05
TC-102M	MDA	2.58E-04	2.58E-04
RU-103	MDA	3.04E-05	3.04E-05
TC-104	MDA	5.81E-05	5.81E-05
F '05	MDA	1.11E-04	1.11E-04
F)5	MDA	7.33E-05	7.33E-05
R 106	MDA	3.35E-04	3.35E-04
RU-106	MDA	3.35E-04	3.35E-04
AG-108M	MDA	2.76E-05	2.76E-05
CD-109	MDA	7.73E-04	7.73E-04

AG-110M	MDA	3.72E-05	3.72E-05
SN-113	MDA	3.85E-05	3.85E-05
SP [illegible]22	MDA	3.40E-05	3.40E-05
[illegible]24	MDA	3.26E-05	3.26E-05
[illegible]25	MDA	9.10E-05	9.10E-05
TE 31M	MDA	1.24E-04	1.24E-04
XE-131M	MDA	9.99E-04	9.99E-04
SB-131	MDA	2.12E-04	2.12E-04
I-131	MDA	3.17E-05	3.17E-05
TE-131	MDA	5.00E-05	5.00E-05
I-132	MDA	3.98E-05	3.98E-05
TE-132	MDA	2.16E-05	2.16E-05
BA-133	MDA	6.68E-05	6.68E-05
TE-133	MDA	9.53E-05	9.53E-05
I-133	MDA	3.28E-05	3.28E-05
XE-133M	MDA	1.96E-04	1.96E-04
XE-133	MDA	8.36E-05	8.36E-05
TE-133M	MDA	4.91E-05	4.91E-05
TE-134	MDA	8.94E-05	8.94E-05
I-134	MDA	4.57E-05	4.57E-05
CS-134	MDA	4.82E-05	4.82E-05
I-135	MDA	1.65E-04	1.65E-04
XE-135M	MDA	9.03E-05	9.03E-05
XE-135	MDA	2.11E-05	2.11E-05
CS-136	MDA	4.17E-05	4.17E-05
CS-137	MDA	5.01E-05	5.01E-05
CS-138	MDA	5.28E-05	5.28E-05
XE-138	MDA	1.66E-04	1.66E-04
[illegible]139	MDA	1.98E-03	1.98E-03
[illegible]39	MDA	1.08E-04	1.08E-04
CS[illegible]38M	MDA	1.31E-03	1.31E-03
CE-139	MDA	2.30E-05	2.30E-05
BA-140	MDA	1.03E-04	1.03E-04
LA-140	MDA	4.60E-05	4.60E-05
BA-141	MDA	9.95E-05	9.95E-05
LA-141	MDA	1.54E-03	1.54E-03
CE-141	MDA	3.70E-05	3.70E-05
BA-142	MDA	3.44E-04	3.44E-04
LA-142	MDA	6.53E-05	6.53E-05
CE-143	MDA	7.60E-05	7.60E-05
PR-144	MDA	2.18E-03	2.18E-03
CE-144	MDA	1.40E-04	1.40E-04
PR-146	MDA	1.07E-04	1.07E-04
CE-146	MDA	1.11E-04	1.11E-04
ND-147	MDA	9.48E-05	9.48E-05
PR-147	MDA	2.96E-04	2.96E-04
PM-149	MDA	7.89E-04	7.89E-04
EU-152	MDA	6.17E-05	6.17E-05
HF-181	MDA	3.42E-05	3.42E-05
W-187	MDA	1.22E-04	1.22E-04
HG-203	MDA	2.59E-05	2.59E-05
NP-237	MDA	2.06E-04	2.06E-04
U-237	MDA	7.23E-05	7.23E-05
NP-239	MDA	8.87E-05	8.87E-05
[illegible]41	MDA	1.02E-04	1.02E-04
E [illegible]4	MDA	4.30E-05	4.30E-05
EU-155	MDA	7.63E-05	7.63E-05
NB-94	MDA	3.62E-05	3.62E-05

GAMMA SPECTRUM ANALYSIS

CANBERRA APOGEE V2.4

Canberra Industries, Inc. 18-NOV-97 11:01:26

ANALYSIS PARAMETERS

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 1	ADC unit number	: 1.0
Detector number	: 1	Geometry number	: 5
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 1.0	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
ERA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : VACUUM BAG Analyzed by: SLC

Sample size : 1.000000E+00 EA Conv. factor : 1.000
Standard size : 1.000000E+00 EA

Sample taken on : 18-NOV-97 at 08:00:00
Collect started on : 18-NOV-97 at 08:00:00
Decay time : 0.0 minutes

live time : 3000.0 seconds real time : 3000.0 seconds
dead time : 0.00 %

Energy calibration used done on 11 / 18 / 1997
Efficiency calibration used done on 11 / 9 / 1996

*** P E A K F I T R E P O R T *** 18-NOV-97 11:01:26

Peak no.		nuclide(s)	centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	error %
	1	NATURAL	477.27	238.68	1.35	49.1	19.01	0.7	19.46
B	1			238.68		13.7	13.06		
	2	PB-214	703.54	351.84	1.29	34.0	20.95	0.7	21.18
	3	NATURAL	1166.10	583.16	1.63	34.5	19.54	1.0	19.85
	4	CO-60	2346.52	1173.22	1.93	87.0	11.27	4.8	11.62
	5	CO-60	2665.76	1332.70	1.95	65.4	13.21	4.0	13.55
	6	NATURAL	2922.49	1460.91	2.12	59.0	13.83	3.9	14.14
B	6			1460.91		7.9	14.16		

B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0001.MC1
background description: 25K LUB OIL BLK 11/1

*** R A D I O N U C L I D E R E P O R T *** 18-NOV-97 11:01:26

Sample description :VACUUM BAG
Analyzed by :SLC

number	nuclide	conf.value	Activity (uCi/EA) measured		decay corrected	
1. Fission gases						
		total	0.00E+00		total	0.00E+00
2. Iodines						
		total	0.00E+00		total	0.00E+00
3. Particulates						
1	CO-60	0.9936	1.18E-04	+-1.05E-05	1.18E-04	+-1.05E-05
		total	1.18E-04		total	1.18E-04

These peaks were not identified

number	channel	energy	peak intensity (gps)	
	477.3	238.68	5.3270E-01 +-1.45E-01	NATURAL
2	703.5	351.84	6.7020E-01 +-1.42E-01	PB-214
3	1166.1	583.16	1.0234E+00 +-2.03E-01	NATURAL
6	2922.5	1460.91	3.3551E+00 +-5.50E-01	NATURAL

Errors quoted at 1.000 sigma (68.3%)

** M D A C A L C U L A T I O N R E P O R T *** 18-NOV-97 11:01:26

Sample description :VACUUM BAG
Analyzed by :SLC

		MDA (uCi/EA) measured	MDA (uCi/EA) decay corrected
NA-24	MDA	1.56E-05	1.56E-05
AR-41	MDA	2.29E-05	2.29E-05
CR-51	MDA	1.70E-04	1.70E-04
MN-54	MDA	2.81E-05	2.81E-05
MN-56	MDA	2.53E-05	2.53E-05
CO-57	MDA	1.59E-05	1.59E-05
CO-58	MDA	2.75E-05	2.75E-05
FE-59	MDA	5.25E-05	5.25E-05
CU-64	MDA	4.07E-03	4.07E-03
NI-65	MDA	7.09E-05	7.09E-05
ZN-65	MDA	7.89E-05	7.89E-05
SE-75	MDA	2.19E-05	2.19E-05
BR-84	MDA	6.88E-05	6.88E-05
KR-85	MDA	7.62E-03	7.62E-03
SR-85	MDA	3.33E-05	3.33E-05
KR-85M	MDA	1.87E-05	1.87E-05
[illegible] 7	MDA	3.21E-05	3.21E-05
Kr[illegible]3	MDA	5.75E-05	5.75E-05
Y-88	MDA	5.71E-06	5.71E-06
RB-88	MDA	6.02E-05	6.02E-05
RB-89	MDA	1.16E-04	1.16E-04
KR-89	MDA	8.61E-04	8.61E-04
Y-91M	MDA	2.07E-05	2.07E-05
SR-91	MDA	9.96E-05	9.96E-05
Y-92	MDA	2.27E-04	2.27E-04
SR-92	MDA	3.15E-05	3.15E-05
Y-93	MDA	2.17E-04	2.17E-04
Y-94	MDA	1.31E-04	1.31E-04
Y-95	MDA	6.69E-04	6.69E-04
NB-95	MDA	2.56E-05	2.56E-05
NB-95M	MDA	6.85E-05	6.85E-05
ZR-95	MDA	3.89E-05	3.89E-05
ZR-97	MDA	4.66E-04	4.66E-04
NB-97	MDA	2.92E-05	2.92E-05
MO-99	MDA	1.93E-04	1.93E-04
TC-99M	MDA	1.48E-05	1.48E-05
MO-101	MDA	2.01E-04	2.01E-04
TC-101	MDA	5.31E-05	5.31E-05
TC-102M	MDA	1.89E-04	1.89E-04
RU-103	MDA	2.15E-05	2.15E-05
TC-104	MDA	4.12E-05	4.12E-05
[illegible] 05	MDA	8.19E-05	8.19E-05
[illegible] 05	MDA	4.66E-05	4.66E-05
RH-106	MDA	2.33E-04	2.33E-04
RU-106	MDA	2.33E-04	2.33E-04
AG-108M	MDA	2.01E-05	2.01E-05
CD-109	MDA	5.76E-04	5.76E-04

AG-110M	MDA	3.03E-05	3.03E-05
SN-113	MDA	2.69E-05	2.69E-05
SB-122	MDA	2.97E-05	2.97E-05
[illegible]	MDA	1.98E-05	1.98E-05
[illegible]	MDA	6.31E-05	6.31E-05
TE-131M	MDA	6.74E-05	6.74E-05
XE-131M	MDA	7.62E-04	7.62E-04
SB-131	MDA	1.41E-04	1.41E-04
I-131	MDA	1.93E-05	1.93E-05
TE-131	MDA	3.78E-05	3.78E-05
I-132	MDA	2.33E-05	2.33E-05
TE-132	MDA	1.83E-05	1.83E-05
BA-133	MDA	3.85E-05	3.85E-05
TE-133	MDA	7.54E-05	7.54E-05
I-133	MDA	1.92E-05	1.92E-05
XE-133M	MDA	1.37E-04	1.37E-04
XE-133	MDA	6.59E-05	6.59E-05
TE-133M	MDA	4.88E-05	4.88E-05
TE-134	MDA	6.86E-05	6.86E-05
I-134	MDA	2.62E-05	2.62E-05
CS-134	MDA	2.77E-05	2.77E-05
I-135	MDA	1.04E-04	1.04E-04
XE-135M	MDA	5.38E-05	5.38E-05
XE-135	MDA	1.79E-05	1.79E-05
CS-136	MDA	2.44E-05	2.44E-05
CS-137	MDA	3.81E-05	3.81E-05
CS-138	MDA	3.82E-05	3.82E-05
XE-138	MDA	1.35E-04	1.35E-04
[illegible]	MDA	1.30E-03	1.30E-03
[illegible]	MDA	9.07E-05	9.07E-05
[illegible]	MDA	8.80E-04	8.80E-04
CE-139	MDA	1.93E-05	1.93E-05
BA-140	MDA	7.04E-05	7.04E-05
LA-140	MDA	3.46E-05	3.46E-05
BA-141	MDA	6.73E-05	6.73E-05
LA-141	MDA	8.99E-04	8.99E-04
CE-141	MDA	3.03E-05	3.03E-05
BA-142	MDA	3.03E-04	3.03E-04
LA-142	MDA	4.89E-05	4.89E-05
CE-143	MDA	4.44E-05	4.44E-05
PR-144	MDA	1.91E-03	1.91E-03
CE-144	MDA	1.26E-04	1.26E-04
PR-146	MDA	7.64E-05	7.64E-05
CE-146	MDA	8.57E-05	8.57E-05
ND-147	MDA	8.10E-05	8.10E-05
PR-147	MDA	2.11E-04	2.11E-04
PM-149	MDA	5.17E-04	5.17E-04
EU-152	MDA	4.76E-05	4.76E-05
HF-181	MDA	2.46E-05	2.46E-05
W-187	MDA	8.76E-05	8.76E-05
HG-203	MDA	2.01E-05	2.01E-05
NP-237	MDA	1.60E-04	1.60E-04
U-237	MDA	6.41E-05	6.41E-05
NP-239	MDA	6.34E-05	6.34E-05
[illegible]	MDA	8.86E-05	8.86E-05
[illegible]	MDA	3.22E-05	3.22E-05
[illegible]	MDA	5.94E-05	5.94E-05
NB-94	MDA	2.02E-05	2.02E-05

SPECTRUM ANALYSIS

18-NOV-97 06:58:28

...SIS PARAMETERS

	: 100.0	Sample no.	: 1.0
	: 1	ADC unit number	: 2.0
	: 2	Geometry number	: 2
...eshold 1	: 2.0	Search threshold 2	: 3.0
... FROM channel	: 50	Search TO channel	: 4095
...nergy tolerance	: 0.7	Order of background	: linear
...moothing factor	: 0	Random sum corr	: disabled
GRA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : INFO CTR S-1 Analyzed by: ELM

...ple size : 1.000000E+00 EA Conv. factor : 1.000
Standard size : 1.000000E+00 EA

Sample taken on : 17-NOV-97 at 17:00:00
Collect started on : 18-NOV-97 at 06:06:12
Decay time : 786.2 minutes

live time : 3000.0 seconds real time : 3011.0 seconds
dead time : 0.37 %

Energy calibration used done on 11 / 16 / 1997
Efficiency calibration used done on 11 / 7 / 1996

Carpet sample
Pat Bostic has compared
peaks to Unit

*** P E A K F I T R E P O R T *** 18-NOV-97 06:58:28

peak no.		nuclide(s)		centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	err %
	1		Pb-210	93.51	46.45	1.06	1626.5	4.31	32.5	48.17
	2	NATURAL	U-234?, Pb-214?	106.96	53.18	0.94 (1875)	747.0	8.57	12.2	35.89
	3	NATURAL	Pa-234, Th-234	127.09	63.25	1.07	4949.6	2.00	66.3	21.11
	4		Th-234?	135.54	67.48	1.12	594.0	11.18	7.5	20.13
M	5	PB-214	NATURAL	150.06	74.74	1.05	10541.6	1.21	122.5	11.07
M	6	PB-214		154.60	77.01	1.06	18597.8	0.83	212.0	9.62
M	7	AG-108M		159.00	79.22	1.06	1499.2	4.91	16.8	9.69
M	8	BA-133	XE-133 Ra-226?	162.68	81.06	1.06 (2027)	1392.4	5.27 (1414)	15.4	9.12
M	9		Ra-226?	168.24	83.84	1.06 (2351)	3368.0	2.66	36.6	6.80
M	10	NP-237 NATURAL	EU-155 Pb-214?	174.78	87.11	1.06 (8300)	6053.2	1.72	64.7	5.44
M	11			180.34	89.89	1.07	2469.7	3.15	26.1	5.48
M	12	NATURAL	Th-234	185.55	92.50	1.07	9569.7	1.20	100.2	4.22
B	12				92.50		12.8	14.10		
M	13	Pa-231, Pa-234m?,	Ra-226?	190.36	94.90	1.07 (505)	1065.6	5.77	11.1	6.92
M	14		Pa-234, Pa-234m?	197.35	98.40	1.07	936.3	6.43	9.7	7.42
	15		Th-234	225.86	112.67	1.00 (806/430)	508.1	10.96	5.2	11.74
	16	NATURAL??		288.23	143.88	1.12	1575.5	4.18	17.4	5.54
	17	XE-138		308.86	154.20	1.11	839.3	7.09	9.7	7.97
	18	BA-140 XE131M	NATURAL	327.15	163.35	1.08	522.5	10.69	6.3	11.55
	19	NATURAL	NATURAL Pa-234, Ra-226	372.44	186.01	1.19	12180.3	1.02	162.0	4.02
	19		Pa-234, Ra-226		186.01		6.9	22.04		
	20	KR-88		392.71	196.15	0.93	176.0	27.37	2.4	27..
	21			411.09	205.35	1.26	497.6	9.83	7.2	10.64
	22	I-134		472.40	236.03	1.18	955.3	5.32	15.6	6.77
	23		Pb-214	484.36	242.01	1.18	11098.3	1.04	185.4	4.29
M	24			512.53	256.11	1.18	524.2	8.18	9.2	9.13
M	25	XE-138	Pb-214	517.91	258.80	1.18 (819)	721.0	6.40	12.8	7.56
M	26			539.01	269.35	1.19	1140.3	4.35	21.1	5.84
M	27			543.04	271.37	1.19	814.7	5.52	15.2	6.74
M	28		Pb-214	549.50	274.61	1.19 (425)	376.0	10.76	7.1	11.42
	29	PM-149		572.42	286.07	1.21	124.3	29.21	2.4	29.44
	30	PB-214		590.65	295.20	1.21	22864.2	0.69	462.2	3.62
?	31	NATURAL?		600.28	300.01	1.08	249.1	15.35	5.1	15.75
	32			648.00	323.89	1.01	269.5	13.29	6.0	13.68
	33			660.06	329.93	1.32	254.4	14.02	5.7	14.38
	34	PB-214 (Pa-234)		704.00	351.91	1.29	37934.3	0.53	914.9	3.13
M	35		Bi-214?	773.62	386.75	1.27	245.1	13.98	6.5	14.31
M	36		Bi-214?	777.78	388.83	1.27	298.5	12.16	8.0	12.55
M	37	KR-87		804.06	401.98	1.28	394.4	9.52	10.9	10.01
M	38	I-134	Bi-214???	810.66	405.29	1.28 (.....)	235.0	16.11	6.5	16.40
	39	XE-137	Bi-214?	909.93	454.96	1.18 (100)	180.4	16.47	5.7	16.80
	40		Pb-214?	961.13	480.58	1.40 (.....)	267.9	11.01	8.9	11.53
	41	TE-129	Pb-214?	974.38	487.21	1.29 (.....)	276.8	10.85	9.3	11.38
	42			1019.31	509.70	1.31	139.8	18.29	4.9	18.62
	43		Pb-214?	1067.51	533.82	1.78 (.....)	167.7	15.06	6.2	15.47
	44		Pb-214?	1160.17	580.18	1.24 (.....)	170.0	14.87	6.8	15.28
	45	BI-214		1218.43	609.34 ✓	1.40	25049.9	0.65	1060.0	3.'
	46		Bi-214?	1330.76	665.54 ✓	1.38 (845)	677.0	4.88	31.3	5.8✓
	47	NB-94	Bi-214	1405.93	703.15	1.74 (214/229)	223.5	10.93	10.9	11.37
	48		Bi-214	1439.31	719.86	1.48 (178) (174)	189.0	12.45	9.4	12.82

	49			1467.89	734.16	1.34		40.9	46.87	2.1	46.9
	50	ZR-97	Pa-234	1485.14	742.79	1.66	?	151.6	14.86	7.8	15.1
	51		Bi-214	1505.03	752.74	1.53	(50)	87.4	23.15	4.6	23.3
	52	*	Bi-214	1536.37	768.42	1.50		2177.9	2.41	116.1	3.7
	53	BI-212	Po-214?	1571.36	785.93	1.46	(.....)	520.9	5.94	28.4	6.5
	54	(Bi-214)		1597.07	798.79	1.41	(136)	45.2	43.38	2.5	43
	55		Bi-214	1612.02	806.27	1.57	(540)	530.3	5.80	29.6	6.
	56		Bi-214	1642.10	821.32	1.47	(63)	87.4	24.41	5.0	24.5
	57		Pb-214?	1677.51	839.04	1.50	(.....)	225.1	11.12	13.1	11.4
	58	Y-92	Bi-214	1867.62	934.15	1.56		1079.3	3.70	69.6	4.4
	59	EU-152	Bi-214	1927.36	964.04	1.32	(132)	128.1	17.02	8.5	17.2
	60	NATURAL	Pa-234m?	2001.56	1001.16	1.63		302.3	8.44	20.8	8.8
	61		Bi-214	2103.20	1052.01	1.72	(105)	139.9	14.13	10.1	14.3
	62		Bi-214?	2139.91	1070.37	1.61	(126)	75.2	24.19	5.5	24.3
	63	BI-214	.....	2239.92	1120.39	1.70		4881.2	1.50	373.5	3.1
	64		Bi-214	2309.74	1155.32	1.75	(562)	558.0	5.21	43.9	5.9
	65			2363.61	1182.26	1.86		94.2	19.21	7.6	19.4
	66		Bi-214?	2414.96	1207.94	1.70	(153)	94.2	19.53	7.7	19.7
	67	BI-214	CO-56.....	2475.51	1238.22	1.82		1690.0	2.65	142.0	3.9
	68		Bi-214	2560.93	1280.94	1.84	(432)	417.5	6.16	36.2	6.8
	69	BI-214	.....	2754.51	1377.74	1.87		1243.5	3.14	115.3	4.3
	70		Bi-214?	2769.41	1385.19	2.02	(258)	185.3	10.70	17.3	11.1
M	71		Bi-214?	2802.08	1401.52	1.84	(437)	305.0	7.58	28.7	8.1
M	72	EU-152	Bi-214	2815.23	1408.09	1.84	(541)	634.9	4.73	60.0	5.6
	73		Bi-214	3017.45	1509.19	1.82	(549)	571.9	5.14	57.6	5.9
	74		Bi-214??	3086.33	1543.62	1.85	(84)	98.4	18.69	10.1	18.9
	75		"	3165.47	1583.17	1.94		193.7	9.75	20.4	10.1
	76		"	3197.74	1599.30	1.81		48.9	30.09	5.2	30.2
	77		Bi-214?	3321.52	1661.16	2.19	(388)	234.8	7.86	25.9	8.4
	78		Bi-214	3458.37	1729.53	1.94	(662)	847.8	3.62	96.9	4.8
	79	BI-214	.....	3528.11	1764.37	2.07		3609.2	1.69	420.0	3.9
	80		Bi-214?	3675.85	1838.17	2.28	(92)	63.9	18.00	7.7	18.
	81		Bi-214	3693.98	1847.23	2.00	(477)	503.2	4.85	61.1	6.4

M - Peak is a multiplet
? - Poor goodness-of-fit value.
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0002.MC1
background description: 25K LUB OIL BLK 11/1

Pa-234 debatable as confirming peak @ 131.2 keV not seen with a 20.4% yield

*Bi-212 confirming/primary peak not seen!

*** R A D I O N U C L I D E R E P O R T *** 18-NOV-97 06:58:28

mple description :INFO CTR S-1
Analyzed by :ELM

number	nuclide	conf.	value	Activity (uCi/EA) measured		decay corrected	
1. Fission gases							
1	KR-87		0.3498	7.41E-04	+-7.42E-05	9.37E-01	+-9.38E-02
5	XE-131M		0.9257	8.68E-03	+-1.00E-03	8.97E-03	+-1.04E-03
6	XE-133		0.9991	1.14E-03	+-1.04E-04	1.22E-03	+-1.11E-04
			total	1.06E-02		total 9.47E-01	
2. Iodines							
			total	0.00E+00		total 0.00E+00	
3. Particulates							
2	Y-92		0.2620	1.47E-02	+-6.52E-04	1.91E-01	+-8.48E-03
3	NB-94		0.1390	2.96E-04	+-3.36E-05	2.96E-04	+-3.36E-05
4	NB-95M		0.9741	1.69E-03	+-1.15E-04	1.88E-03	+-1.27E-04
7	PM-149		0.9993	2.32E-03	+-6.84E-04	2.76E-03	+-8.11E-04
8	EU-155	?	0.3255	5.15E-03	+-2.80E-04	5.15E-03	+-2.80E-04
9	NP-237	?	0.6537	1.39E-02	+-7.55E-04	1.39E-02	+-7.55E-04
			total	3.80E-02		total 2.15E-01	

? = nuclides with a common single line, cannot identify which one is present

These peaks were not identified

number	channel	energy	peak intensity (gps)	
1	93.5	46.45	3.2450E+01 +-1.56E+01	PB-210
2	107.0	53.18	1.2240E+01 +-4.39E+00	NATURAL U-234, PB-214
3	127.1	63.25	6.6258E+01 +-1.40E+01	NATURAL Pa-234, Th-234
4	135.5	67.48	7.4817E+00 +-1.51E+00	Th-230?
5	150.1	74.74	1.2254E+02 +-1.36E+01	PB-214 NATURAL
6	154.6	77.01	2.1195E+02 +-2.04E+01	PB-214
7	159.0	79.22	1.6797E+01 +-1.63E+00	AG-108M
9	168.2	83.84	3.6623E+01 +-2.49E+00	Pa-226
11	180.3	89.89	2.6102E+01 +-1.43E+00	??
12	185.5	92.50	1.0010E+02 +-4.23E+00	NATURAL Th-234
13	190.4	94.90	1.1086E+01 +-7.67E-01	Ra-226, Pa-234, Pa-234m?
14	197.3	98.40	9.6679E+00 +-7.17E-01	Pa-234, Pa-234m?
15	225.9	112.67	5.2141E+00 +-6.12E-01	Th-234
16	288.2	143.88	1.7446E+01 +-9.66E-01	NATURAL?? U-235!
17	308.9	154.20	9.6924E+00 +-7.73E-01	XE-138
19	372.4	186.01	1.6192E+02 +-6.51E+00	NATURAL NATURAL Ra-226, Pa-234
20	392.7	196.15	2.4445E+00 +-6.76E-01	KR-88
21	411.1	205.35	7.1798E+00 +-7.64E-01	??
23	484.4	242.01	1.8541E+02 +-7.95E+00	Pb-214
24	512.5	256.11	9.2350E+00 +-8.43E-01	??
25	517.9	258.80	1.2829E+01 +-9.70E-01	XE-138

26	539.0	269.35	2.1081E+01	+-1.23E+00	→ ??
27	543.0	271.37	1.5170E+01	+-1.02E+00	→ ??
28	549.5	274.61	7.0819E+00	+-8.09E-01	Pb-214
30	590.7	295.20	4.6222E+02	+-1.68E+01	PB-214
31	600.3	300.01	5.1177E+00	+-8.06E-01	NATURAL??
32	648.0	323.89	5.9758E+00	+-8.18E-01	→ ??
33	660.1	329.93	5.7483E+00	+-8.27E-01	→ ??
34	704.0	351.91	9.1490E+02	+-2.86E+01	PB-214 Pa-234
35	773.6	386.75	6.5091E+00	+-9.32E-01	Bi-214?
36	777.8	388.83	7.9718E+00	+-1.00E+00	Bi-214?
38	810.7	405.29	6.5500E+00	+-1.07E+00	I-134 → no gp decayed; Bi-214???
39	909.9	454.96	5.6619E+00	+-9.51E-01	XE-137 T½ too short; Bi-214?
40	961.1	480.58	8.8972E+00	+-1.03E+00	Pb-214?
41	974.4	487.21	9.3221E+00	+-1.06E+00	TE-129 T½ too short, Pb-214?
42	1019.3	509.70	4.9312E+00	+-9.18E-01	→ ?? Annihilation Peak ???
43	1067.5	533.82	6.2036E+00	+-9.60E-01	Pb-214?
44	1160.2	580.18	6.8442E+00	+-1.05E+00	Pb-214?
45	1218.4	609.34	1.0600E+03	+-3.74E+01	BI-214
46	1330.8	665.54	3.1304E+01	+-1.84E+00	Bi-214?
48	1439.3	719.86	9.4481E+00	+-1.21E+00	Bi-214
49	1467.9	734.16	2.0833E+00	+-9.79E-01	⇒ ??
50	1485.1	742.79	7.8175E+00	+-1.18E+00	ZR-97 T½ too short, Pa-234
51	1505.0	752.74	4.5689E+00	+-1.07E+00	Bi-214
52	1536.4	768.42	1.1614E+02	+-4.35E+00	Bi-214
53	1571.4	785.93	2.8398E+01	+-1.86E+00	BI-212 no confirming peaks not there [illegible] Pb-2[illegible] Bi[illegible]
54	1597.1	798.79	2.5044E+00	+-1.09E+00	→ ??
55	1612.0	806.27	2.9643E+01	+-1.90E+00	Bi-214
56	1642.1	821.32	4.9728E+00	+-1.22E+00	Bi-214
57	1677.5	839.04	1.3081E+01	+-1.49E+00	Pb-214?
59	1927.4	964.04	8.5090E+00	+-1.46E+00	EU-152 (Peak@1112 confirming peak not [illegible] Bi-21[illegible]
60	2001.6	1001.16	2.0806E+01	+-1.83E+00	NATURAL? Pa-234m?
61	2103.2	1052.01	1.0094E+01	+-1.45E+00	Bi-214
62	2139.9	1070.37	5.5163E+00	+-1.34E+00	Bi-214?
63	2239.9	1120.39	3.7354E+02	+-1.16E+01	BI-214
64	2309.7	1155.32	4.3943E+01	+-2.60E+00	Bi-214
65	2363.6	1182.26	7.5793E+00	+-1.47E+00	→ ?
66	2415.0	1207.94	7.7295E+00	+-1.53E+00	Bi-214?
67	2475.5	1238.22	1.4195E+02	+-5.60E+00	BI-214 (CO-56 confirming peaks not [illegible]
68	2560.9	1280.94	3.6183E+01	+-2.47E+00	Bi-214
69	2754.5	1377.74	1.1527E+02	+-5.01E+00	BI-214
70	2769.4	1385.19	1.7263E+01	+-1.92E+00	Bi-214?
71	2802.1	1401.52	2.8717E+01	+-2.34E+00	Bi-214?
72	2815.2	1408.09	6.0048E+01	+-3.36E+00	EU-152 (Confirming peak@ 1112 not the[illegible]
73	3017.5	1509.19	5.7646E+01	+-3.41E+00	Bi-214
74	3086.3	1543.62	1.0122E+01	+-1.92E+00	Bi-214??
75	3165.5	1583.17	2.0402E+01	+-2.08E+00	Bi-214??
76	3197.7	1599.30	5.2007E+00	+-1.57E+00	Bi-214??
77	3321.5	1661.16	2.5852E+01	+-2.18E+00	Bi-214?
78	3458.4	1729.53	9.6868E+01	+-4.74E+00	Bi-214
79	3528.1	1764.37	4.2003E+02	+-1.63E+01	BI-214
80	3675.9	1838.17	7.7229E+00	+-1.43E+00	Bi-214?
81	3694.0	1847.23	6.1102E+01	+-3.92E+00	Bi-214

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 18-NOV-97 06:58:28

ample description :INFO CTR S-1
Analyzed by :ELM

		MDA (uCi/EA) measured	decay corrected
NA-24	MDA	2.96E-04	5.42E-04
AR-41	MDA	2.77E-04	3.99E-02
CR-51	MDA	1.49E-03	1.51E-03
MN-54	MDA	2.60E-04	2.60E-04
MN-56	MDA	2.42E-04	8.19E-03
CO-57	MDA	1.24E-04	1.24E-04
CO-58	MDA	2.83E-04	2.84E-04
FE-59	MDA	4.93E-04	4.97E-04
CO-60	MDA	2.84E-04	2.84E-04
CU-64	MDA	6.07E-02	1.24E-01
NI-65	MDA	1.38E-03	5.06E-02
ZN-65	MDA	9.86E-04	9.88E-04
SE-75	MDA	1.87E-04	1.87E-04
BR-84	MDA	6.32E-04	1.75E+04
KR-85	MDA	4.25E-02	4.25E-02
SR-85	MDA	1.86E-04	1.87E-04
KR-85M	MDA	1.63E-04	1.23E-03
-88	MDA	5.18E-04	1.27E-02
88	MDA	2.53E-04	2.54E-04
RB-88	MDA	2.67E-03	5.29E+10
RB-89	MDA	1.14E-03	2.42E+12
KR-89	MDA	6.87E-03	> 1.00E+20
Y-91M	MDA	1.86E-04	1.07E+01
SR-91	MDA	7.99E-04	2.08E-03
SR-92	MDA	5.86E-04	1.67E-02
Y-93	MDA	2.03E-03	4.98E-03
Y-94	MDA	1.04E-03	4.69E+09
Y-95	MDA	4.99E-03	> 1.00E+20
NB-95	MDA	3.87E-04	3.91E-04
ZR-95	MDA	3.96E-04	3.99E-04
ZR-97	MDA	3.37E-03	5.76E-03
NB-97	MDA	1.98E-04	3.80E-01
MO-99	MDA	1.76E-03	2.02E-03
TC-99M	MDA	1.47E-04	1.68E-04
MO-101	MDA	1.80E-03	2.85E+13
TC-101	MDA	4.56E-04	2.12E+13
TC-102M	MDA	1.58E-03	> 1.00E+20
RU-103	MDA	1.89E-04	1.90E-04
TC-104	MDA	4.16E-04	4.95E+09
RH-105	MDA	7.62E-04	9.85E-04
RU-105	MDA	4.57E-04	3.53E-03
RH-106	MDA	1.93E-03	1.93E-03
RU-106	MDA	1.93E-03	1.93E-03
-108M	MDA	1.90E-04	1.90E-04
-109	MDA	5.31E-03	5.32E-03
AG-110M	MDA	2.06E-04	2.06E-04
SN-113	MDA	2.91E-04	2.92E-04

SB-122	:	MDA	: 2.57E-04	2.96E-04
SB-124	:	MDA	: 2.12E-04	2.13E-04
SB-125	:	MDA	: 6.63E-04	6.63E-04
T[illegible] 131M	:	MDA	: 9.24E-04	1.25E-03
131	:	MDA	: 1.16E-03	2.18E+07
[illegible] 31	:	MDA	: 1.96E-04	2.06E-04
T[illegible] 131	:	MDA	: 3.25E-04	9.52E+05
I-132	:	MDA	: 2.48E-04	1.32E-02
TE-132	:	MDA	: 1.44E-04	1.61E-04
BA-133	:	MDA	: 6.73E-04	6.73E-04
TE-133	:	MDA	: 6.27E-04	6.41E+15
I-133	:	MDA	: 2.01E-04	3.10E-04
XE-133M	:	MDA	: 1.26E-03	1.49E-03
TE-133M	:	MDA	: 3.06E-04	5.72E+00
TE-134	:	MDA	: 5.78E-04	2.66E+02
I-134	:	MDA	: 2.51E-04	7.92E+00
CS-134	:	MDA	: 2.68E-04	2.69E-04
I-135	:	MDA	: 1.04E-03	4.13E-03
XE-135M	:	MDA	: 5.38E-04	1.38E+12
XE-135	:	MDA	: 1.39E-04	3.78E-04
CS-136	:	MDA	: 2.41E-04	2.48E-04
CS-137	:	MDA	: 2.54E-04	2.54E-04
CS-138	:	MDA	: 3.89E-04	8.71E+03
XE-138	:	MDA	: 1.28E-03	7.18E+13
CS-139	:	MDA	: 1.89E-02	> 1.00E+20
BA-139	:	MDA	: 7.41E-04	5.22E-01
CS-138M	:	MDA	: 7.94E-03	> 1.00E+20
CE-139	:	MDA	: 1.58E-04	1.58E-04
BA-140	:	MDA	: 7.51E-04	7.73E-04
[illegible]-140	:	MDA	: 3.27E-04	3.37E-04
141	:	MDA	: 6.82E-04	6.14E+09
[illegible] 141	:	MDA	: 1.13E-02	1.13E-01
CE-141	:	MDA	: 2.69E-04	2.72E-04
BA-142	:	MDA	: 2.57E-03	> 1.00E+20
LA-142	:	MDA	: 3.57E-04	1.08E-01
CE-143	:	MDA	: 9.61E-04	1.27E-03
PR-144	:	MDA	: 1.49E-02	1.49E-02
CE-144	:	MDA	: 1.01E-03	1.01E-03
PR-146	:	MDA	: 7.06E-04	5.13E+06
CE-146	:	MDA	: 7.69E-04	8.17E+13
ND-147	:	MDA	: 7.65E-04	7.92E-04
PR-147	:	MDA	: 1.87E-03	4.73E+14
EU-152	:	MDA	: 3.71E-04	3.71E-04
HF-181	:	MDA	: 2.13E-04	2.15E-04
W-187	:	MDA	: 7.60E-04	1.11E-03
HG-203	:	MDA	: 1.63E-04	1.64E-04
NP-237	:	MDA	: 1.53E-03	1.53E-03
U-237	:	MDA	: 4.53E-04	4.79E-04
NP-239	:	MDA	: 4.72E-04	5.54E-04
AM-241	:	MDA	: 5.07E-04	5.07E-04
EU-154	:	MDA	: 2.63E-04	2.63E-04
EU-155	:	MDA	: 5.22E-04	5.22E-04

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* G A M M A S P E C T R U M A N A L Y S I S *

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NBERRA APOGEE V2.4

Canberra Industries, Inc. 18-NOV-97 06:58:28

A N A L Y S I S P A R A M E T E R S

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 1	ADC unit number	: 2.0
Detector number	: 2	Geometry number	: 2
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 0.7	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
GRA parameter	: 0	Baseline channels	: disabled

better detector

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : INFO CTR S-1 Analyzed by: ELM

ple size : 1.000000E+00 EA Conv. factor : 1.000
ndard size : 1.000000E+00 EA

Sample taken on : 17-NOV-97 at 17:00:00
Collect started on : 18-NOV-97 at 06:06:12
Decay time : 786.2 minutes

live time : 3000.0 seconds real time : 3011.0 seconds
dead time : 0.37 %

Energy calibration used done on 11 / 16 / 1997
Efficiency calibration used done on 11 / 7 / 1996

1st Carpet Sample

*** P E A K F I T R E P O R T *** 18-NOV-97 06:58:28

peak no.		nuclide(s)		centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	er. %
	1			93.51	46.45	1.06	1626.5	4.31	32.5	48.17
	2	NATURAL		106.96	53.18	0.94	747.0	8.57	12.2	35.89
	3	NATURAL		127.09	63.25	1.07	4949.6	2.00	66.3	21.11
	4			135.54	67.48	1.12	594.0	11.18	7.5	20.13
M	5	PB-214	NATURAL	150.06	74.74	1.05	10541.6	1.21	122.5	11.07
M	6	PB-214		154.60	77.01	1.06	18597.8	0.83	212.0	9.62
M	7	AG-108M		159.00	79.22	1.06	1499.2	4.91	16.8	9.69
M	8	BA-133	XE-133	162.68	81.06	1.06	1392.4	5.27	15.4	9.12
M	9			168.24	83.84	1.06	3368.0	2.66	36.6	6.80
M	10	NP-237	EU-155 NATURAL	174.78	87.11	1.06	6053.2	1.72	64.7	5.44
M	11			180.34	89.89	1.07	2469.7	3.15	26.1	5.48
M	12	NATURAL		185.55	92.50	1.07	9569.7	1.20	100.2	4.22
B	12				92.50		12.8	14.10		
M	13			190.36	94.90	1.07	1065.6	5.77	11.1	6.92
M	14			197.35	98.40	1.07	936.3	6.43	9.7	7.42
	15			225.86	112.67	1.00	508.1	10.96	5.2	11.74
	16	NATURAL		288.23	143.88	1.12	1575.5	4.18	17.4	5.54
	17	XE-138		308.86	154.20	1.11	839.3	7.09	9.7	7.97
	18	BA-140 XE131M	NATURAL	327.15	163.35	1.08	522.5	10.69	6.3	11.55
	19	NATURAL	NATURAL	372.44	186.01	1.19	12180.3	1.02	162.0	4.02
	19				186.01		6.9	22.04		
	20	KR-88		392.71	196.15	0.93	176.0	27.37	2.4	27.
	21			411.09	205.35	1.26	497.6	9.83	7.2	10.64
	22	I-134		472.40	236.03	1.18	955.3	5.32	15.6	6.77
	23			484.36	242.01	1.18	11098.3	1.04	185.4	4.29
M	24			512.53	256.11	1.18	524.2	8.18	9.2	9.13
M	25	XE-138		517.91	258.80	1.18	721.0	6.40	12.8	7.56
M	26			539.01	269.35	1.19	1140.3	4.35	21.1	5.84
M	27			543.04	271.37	1.19	814.7	5.52	15.2	6.74
M	28			549.50	274.61	1.19	376.0	10.76	7.1	11.42
	29	PM-149		572.42	286.07	1.21	124.3	29.21	2.4	29.44
	30	PB-214		590.65	295.20	1.21	22864.2	0.69	462.2	3.62
?	31	NATURAL		600.28	300.01	1.08	249.1	15.35	5.1	15.75
	32			648.00	323.89	1.01	269.5	13.29	6.0	13.68
	33			660.06	329.93	1.32	254.4	14.02	5.7	14.38
	34	PB-214		704.00	351.91	1.29	37934.3	0.53	914.9	3.13
M	35			773.62	386.75	1.27	245.1	13.98	6.5	14.31
M	36			777.78	388.83	1.27	298.5	12.16	8.0	12.55
M	37	KR-87		804.06	401.98	1.28	394.4	9.52	10.9	10.01
M	38	I-134		810.66	405.29	1.28	235.0	16.11	6.5	16.40
	39	XE-137		909.93	454.96	1.18	180.4	16.47	5.7	16.80
	40			961.13	480.58	1.40	267.9	11.01	8.9	11.53
	41	TE-129		974.38	487.21	1.29	276.8	10.85	9.3	11.38
	42			1019.31	509.70	1.31	139.8	18.29	4.9	18.62
	43			1067.51	533.82	1.78	167.7	15.06	6.2	15.47
	44			1160.17	580.18	1.24	170.0	14.87	6.8	15.28
	45	BI-214		1218.43	609.34	1.40	25049.9	0.65	1060.0	3
	46			1330.76	665.54	1.38	677.0	4.88	31.3	5.67
	47	NB-94		1405.93	703.15	1.74	223.5	10.93	10.9	11.37
	48			1439.31	719.86	1.48	189.0	12.45	9.4	12.82

	49		1467.89	734.16	1.34	40.9	46.87	2.1	46.97
	50	ZR-97	1485.14	742.79	1.66	151.6	14.86	7.8	15.16
	51		1505.03	752.74	1.53	87.4	23.15	4.6	23.33
	52		1536.37	768.42	1.50	2177.9	2.41	116.1	3.74
	53	BI-212	1571.36	785.93	1.46	520.9	5.94	28.4	6.56
	54		1597.07	798.79	1.41	45.2	43.38	2.5	43.
	55		1612.02	806.27	1.57	530.3	5.80	29.6	6.4
	56		1642.10	821.32	1.47	87.4	24.41	5.0	24.55
	57		1677.51	839.04	1.50	225.1	11.12	13.1	11.43
	58	Y-92	1867.62	934.15	1.56	1079.3	3.70	69.6	4.45
	59	EU-152	1927.36	964.04	1.32	128.1	17.02	8.5	17.20
	60	NATURAL	2001.56	1001.16	1.63	302.3	8.44	20.8	8.80
	61		2103.20	1052.01	1.72	139.9	14.13	10.1	14.36
	62		2139.91	1070.37	1.61	75.2	24.19	5.5	24.33
	63	BI-214	2239.92	1120.39	1.70	4881.2	1.50	373.5	3.10
	64		2309.74	1155.32	1.75	558.0	5.21	43.9	5.91
	65		2363.61	1182.26	1.86	94.2	19.21	7.6	19.42
	66		2414.96	1207.94	1.70	94.2	19.53	7.7	19.74
	67	BI-214 CO-56	2475.51	1238.22	1.82	1690.0	2.65	142.0	3.95
	68		2560.93	1280.94	1.84	417.5	6.16	36.2	6.84
	69	BI-214	2754.51	1377.74	1.87	1243.5	3.14	115.3	4.35
	70		2769.41	1385.19	2.02	185.3	10.70	17.3	11.11
M	71		2802.08	1401.52	1.84	305.0	7.58	28.7	8.16
M	72	EU-152	2815.23	1408.09	1.84	634.9	4.73	60.0	5.60
	73		3017.45	1509.19	1.82	571.9	5.14	57.6	5.92
	74		3086.33	1543.62	1.85	98.4	18.69	10.1	18.92
	75		3165.47	1583.17	1.94	193.7	9.75	20.4	10.18
	76		3197.74	1599.30	1.81	48.9	30.09	5.2	30.24
	77		3321.52	1661.16	2.19	234.8	7.86	25.9	8.42
	78		3458.37	1729.53	1.94	847.8	3.62	96.9	4.89
	79	BI-214	3528.11	1764.37	2.07	3609.2	1.69	420.0	3.8
	80		3675.85	1838.17	2.28	63.9	18.00	7.7	18.
	81		3693.98	1847.23	2.00	503.2	4.85	61.1	6.42

M - Peak is a multiplet
? - Poor goodness-of-fit value.
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0002.MC1
background description: 25K LUB OIL BLK 11/1

*** R A D I O N U C L I D E R E P O R T *** 18-NOV-97 06:58:28

nple description :INFO CTR S-1
lyzed by :ELM

number	nuclide	conf.value	Activity (uCi/EA) measured		decay corrected	
1. Fission gases						
1	KR-87	0.3498	7.41E-04	+-7.42E-05	9.37E-01	+-9.38E-02
5	XE-131M	0.9257	8.68E-03	+-1.00E-03	8.97E-03	+-1.04E-03
6	XE-133	0.9991	1.14E-03	+-1.04E-04	1.22E-03	+-1.11E-04
			--------		--------	
		total	1.06E-02	total	9.47E-01	
2. Iodines						
			--------		--------	
		total	0.00E+00	total	0.00E+00	
3. Particulates						
2	Y-92	0.2620	1.47E-02	+-6.52E-04	1.91E-01	+-8.48E-03
3	NB-94	0.1390	2.96E-04	+-3.36E-05	2.96E-04	+-3.36E-05
4	NB-95M	0.9741	1.69E-03	+-1.15E-04	1.88E-03	+-1.27E-04
7	PM-149	0.9993	2.32E-03	+-6.84E-04	2.76E-03	+-8.11E-04
8	EU-155 ?	0.3255	5.15E-03	+-2.80E-04	5.15E-03	+-2.80E-04
9	NP-237 ?	0.6537	1.39E-02	+-7.55E-04	1.39E-02	+-7.55E-04
			--------		--------	
		total	3.80E-02	total	2.15E-01	

? = nuclides with a common single line, cannot identify which one is present

These peaks were not identified

number	channel	energy	peak intensity (gps)		
1	93.5	46.45	3.2450E+01	+-1.56E+01	
2	107.0	53.18	1.2240E+01	+-4.39E+00	NATURAL
3	127.1	63.25	6.6258E+01	+-1.40E+01	NATURAL
4	135.5	67.48	7.4817E+00	+-1.51E+00	
5	150.1	74.74	1.2254E+02	+-1.36E+01	PB-214 NATURAL
6	154.6	77.01	2.1195E+02	+-2.04E+01	PB-214
7	159.0	79.22	1.6797E+01	+-1.63E+00	AG-108M
9	168.2	83.84	3.6623E+01	+-2.49E+00	
11	180.3	89.89	2.6102E+01	+-1.43E+00	
12	185.5	92.50	1.0010E+02	+-4.23E+00	NATURAL
13	190.4	94.90	1.1086E+01	+-7.67E-01	
14	197.3	98.40	9.6679E+00	+-7.17E-01	
15	225.9	112.67	5.2141E+00	+-6.12E-01	
16	288.2	143.88	1.7446E+01	+-9.66E-01	NATURAL
17	308.9	154.20	9.6924E+00	+-7.73E-01	XE-138
19	372.4	186.01	1.6192E+02	+-6.51E+00	NATURAL NATURAL
20	392.7	196.15	2.4445E+00	+-6.76E-01	KR-88
1	411.1	205.35	7.1798E+00	+-7.64E-01	
3	484.4	242.01	1.8541E+02	+-7.95E+00	
24	512.5	256.11	9.2350E+00	+-8.43E-01	
25	517.9	258.80	1.2829E+01	+-9.70E-01	XE-138

26	539.0	269.35	2.1081E+01	+-1.23E+00	
27	543.0	271.37	1.5170E+01	+-1.02E+00	
28	549.5	274.61	7.0819E+00	+-8.09E-01	
30	590.7	295.20	4.6222E+02	+-1.68E+01	PB-214
.	600.3	300.01	5.1177E+00	+-8.06E-01	NATURAL
32	648.0	323.89	5.9758E+00	+-8.18E-01	
33	660.1	329.93	5.7483E+00	+-8.27E-01	
34	704.0	351.91	9.1490E+02	+-2.86E+01	PB-214
35	773.6	386.75	6.5091E+00	+-9.32E-01	
36	777.8	388.83	7.9718E+00	+-1.00E+00	
38	810.7	405.29	6.5500E+00	+-1.07E+00	I-134
39	909.9	454.96	5.6619E+00	+-9.51E-01	XE-137
40	961.1	480.58	8.8972E+00	+-1.03E+00	
41	974.4	487.21	9.3221E+00	+-1.06E+00	TE-129
42	1019.3	509.70	4.9312E+00	+-9.18E-01	
43	1067.5	533.82	6.2036E+00	+-9.60E-01	
44	1160.2	580.18	6.8442E+00	+-1.05E+00	
45	1218.4	609.34	1.0600E+03	+-3.74E+01	BI-214
46	1330.8	665.54	3.1304E+01	+-1.84E+00	
48	1439.3	719.86	9.4481E+00	+-1.21E+00	
49	1467.9	734.16	2.0833E+00	+-9.79E-01	
50	1485.1	742.79	7.8175E+00	+-1.18E+00	ZR-97
51	1505.0	752.74	4.5689E+00	+-1.07E+00	
52	1536.4	768.42	1.1614E+02	+-4.35E+00	
53	1571.4	785.93	2.8398E+01	+-1.86E+00	BI-212
54	1597.1	798.79	2.5044E+00	+-1.09E+00	
55	1612.0	806.27	2.9643E+01	+-1.90E+00	
56	1642.1	821.32	4.9728E+00	+-1.22E+00	
57	1677.5	839.04	1.3081E+01	+-1.49E+00	
59	1927.4	964.04	8.5090E+00	+-1.46E+00	EU-152
0	2001.6	1001.16	2.0806E+01	+-1.83E+00	NATURAL
1	2103.2	1052.01	1.0094E+01	+-1.45E+00	
62	2139.9	1070.37	5.5163E+00	+-1.34E+00	
63	2239.9	1120.39	3.7354E+02	+-1.16E+01	BI-214
64	2309.7	1155.32	4.3943E+01	+-2.60E+00	
65	2363.6	1182.26	7.5793E+00	+-1.47E+00	
66	2415.0	1207.94	7.7295E+00	+-1.53E+00	
67	2475.5	1238.22	1.4195E+02	+-5.60E+00	BI-214 CO-56
68	2560.9	1280.94	3.6183E+01	+-2.47E+00	
69	2754.5	1377.74	1.1527E+02	+-5.01E+00	BI-214
70	2769.4	1385.19	1.7263E+01	+-1.92E+00	
71	2802.1	1401.52	2.8717E+01	+-2.34E+00	
72	2815.2	1408.09	6.0048E+01	+-3.36E+00	EU-152
73	3017.5	1509.19	5.7646E+01	+-3.41E+00	
74	3086.3	1543.62	1.0122E+01	+-1.92E+00	
75	3165.5	1583.17	2.0402E+01	+-2.08E+00	
76	3197.7	1599.30	5.2007E+00	+-1.57E+00	
77	3321.5	1661.16	2.5852E+01	+-2.18E+00	
78	3458.4	1729.53	9.6868E+01	+-4.74E+00	
79	3528.1	1764.37	4.2003E+02	+-1.63E+01	BI-214
80	3675.9	1838.17	7.7229E+00	+-1.43E+00	
81	3694.0	1847.23	6.1102E+01	+-3.92E+00	

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 18-NOV-97 06:58:28

ɛ ple description :INFO CTR S-1
Analyzed by :ELM

		measured	decay corrected
NA-24	MDA	2.96E-04	5.42E-04
AR-41	MDA	2.77E-04	3.99E-02
CR-51	MDA	1.49E-03	1.51E-03
MN-54	MDA	2.60E-04	2.60E-04
MN-56	MDA	2.42E-04	8.19E-03
CO-57	MDA	1.24E-04	1.24E-04
CO-58	MDA	2.83E-04	2.84E-04
FE-59	MDA	4.93E-04	4.97E-04
CO-60	MDA	2.84E-04	2.84E-04
CU-64	MDA	6.07E-02	1.24E-01
NI-65	MDA	1.38E-03	5.06E-02
ZN-65	MDA	9.86E-04	9.88E-04
SE-75	MDA	1.87E-04	1.87E-04
BR-84	MDA	6.32E-04	1.75E+04
KR-85	MDA	4.25E-02	4.25E-02
SR-85	MDA	1.86E-04	1.87E-04
KR-85M	MDA	1.63E-04	1.23E-03
88	MDA	5.18E-04	1.27E-02
3	MDA	2.53E-04	2.54E-04
RB-88	MDA	2.67E-03	5.29E+10
RB-89	MDA	1.14E-03	2.42E+12
KR-89	MDA	6.87E-03	> 1.00E+20
Y-91M	MDA	1.86E-04	1.07E+01
SR-91	MDA	7.99E-04	2.08E-03
SR-92	MDA	5.86E-04	1.67E-02
Y-93	MDA	2.03E-03	4.98E-03
Y-94	MDA	1.04E-03	4.69E+09
Y-95	MDA	4.99E-03	> 1.00E+20
NB-95	MDA	3.87E-04	3.91E-04
ZR-95	MDA	3.96E-04	3.99E-04
ZR-97	MDA	3.37E-03	5.76E-03
NB-97	MDA	1.98E-04	3.80E-01
MO-99	MDA	1.76E-03	2.02E-03
TC-99M	MDA	1.47E-04	1.68E-04
MO-101	MDA	1.80E-03	2.85E+13
TC-101	MDA	4.56E-04	2.12E+13
TC-102M	MDA	1.58E-03	> 1.00E+20
RU-103	MDA	1.89E-04	1.90E-04
TC-104	MDA	4.16E-04	4.95E+09
RH-105	MDA	7.62E-04	9.85E-04
RU-105	MDA	4.57E-04	3.53E-03
RH-106	MDA	1.93E-03	1.93E-03
RU-106	MDA	1.93E-03	1.93E-03
08M	MDA	1.90E-04	1.90E-04
09	MDA	5.31E-03	5.32E-03
AG-110M	MDA	2.06E-04	2.06E-04
SN-113	MDA	2.91E-04	2.92E-04

SB-122	:	MDA	: 2.57E-04	2.96E-04
SB-124	:	MDA	: 2.12E-04	2.13E-04
SB-125	:	MDA	: 6.63E-04	6.63E-04
TE-131M	:	MDA	: 9.24E-04	1.25E-03
.31	:	MDA	: 1.16E-03	2.18E+07
31	:	MDA	: 1.96E-04	2.06E-04
1 131	:	MDA	: 3.25E-04	9.52E+05
I-132	:	MDA	: 2.48E-04	1.32E-02
TE-132	:	MDA	: 1.44E-04	1.61E-04
BA-133	:	MDA	: 6.73E-04	6.73E-04
TE-133	:	MDA	: 6.27E-04	6.41E+15
I-133	:	MDA	: 2.01E-04	3.10E-04
XE-133M	:	MDA	: 1.26E-03	1.49E-03
TE-133M	:	MDA	: 3.06E-04	5.72E+00
TE-134	:	MDA	: 5.78E-04	2.66E+02
I-134	:	MDA	: 2.51E-04	7.92E+00
CS-134	:	MDA	: 2.68E-04	2.69E-04
I-135	:	MDA	: 1.04E-03	4.13E-03
XE-135M	:	MDA	: 5.38E-04	1.38E+12
XE-135	:	MDA	: 1.39E-04	3.78E-04
CS-136	:	MDA	: 2.41E-04	2.48E-04
CS-137	:	MDA	: 2.54E-04	2.54E-04
CS-138	:	MDA	: 3.89E-04	8.71E+03
XE-138	:	MDA	: 1.28E-03	7.18E+13
CS-139	:	MDA	: 1.89E-02	> 1.00E+20
BA-139	:	MDA	: 7.41E-04	5.22E-01
CS-138M	:	MDA	: 7.94E-03	> 1.00E+20
CE-139	:	MDA	: 1.58E-04	1.58E-04
BA-140	:	MDA	: 7.51E-04	7.73E-04
LA-140	:	MDA	: 3.27E-04	3.37E-04
141	:	MDA	: 6.82E-04	6.14E+09
L 141	:	MDA	: 1.13E-02	1.13E-01
CE-141	:	MDA	: 2.69E-04	2.72E-04
BA-142	:	MDA	: 2.57E-03	> 1.00E+20
LA-142	:	MDA	: 3.57E-04	1.08E-01
CE-143	:	MDA	: 9.61E-04	1.27E-03
PR-144	:	MDA	: 1.49E-02	1.49E-02
CE-144	:	MDA	: 1.01E-03	1.01E-03
PR-146	:	MDA	: 7.06E-04	5.13E+06
CE-146	:	MDA	: 7.69E-04	8.17E+13
ND-147	:	MDA	: 7.65E-04	7.92E-04
PR-147	:	MDA	: 1.87E-03	4.73E+14
EU-152	:	MDA	: 3.71E-04	3.71E-04
HF-181	:	MDA	: 2.13E-04	2.15E-04
W-187	:	MDA	: 7.60E-04	1.11E-03
HG-203	:	MDA	: 1.63E-04	1.64E-04
NP-237	:	MDA	: 1.53E-03	1.53E-03
U-237	:	MDA	: 4.53E-04	4.79E-04
NP-239	:	MDA	: 4.72E-04	5.54E-04
AM-241	:	MDA	: 5.07E-04	5.07E-04
EU-154	:	MDA	: 2.63E-04	2.63E-04
EU-155	:	MDA	: 5.22E-04	5.22E-04

11/15/82

Summary:

Gamma results on the "rock" are characteristic of U-nat. Every peak identified on the "carpet" were also identified on the "Rock" sample, in the same relative concentrations.

Based on the sample results it appears that the "Rock" could have contaminated the "carpet" & that both the "Rock" & "carpet" contaminants is characteristic of U-nat.

[signature]

CURRENT

*** P E A K   F I T   R E P O R T ***   18-NOV-97   13:17:45

	Peak no.	nuclide(s)		centroid channel	energy keV	FWHM keV		net area counts	error %	gammas per second	error %
							ABB %				
M	1	PB-214	NATURAL	149.46	74.82 ✓	1.09	6.2	83.4	14.91	4.8	18.5
M	2	PB-214		154.02	77.10 ✓	1.09	10.5	119.2	11.79	6.7	15.1
	3	NP-237	EU-155	174.26	87.20	1.18		45.5	21.65	2.2	22.2
		NATURAL	CD-109								
	4	NATURAL	NATURAL Ra	372.85	186.30	1.58	3.28	89.1	12.65	4.7	13.2
B	4		U-235		186.30		4	3.6	16.28		
	5			484.48	242.03	1.28		98.9	12.07	6.8	12.7
	6	PB-214		590.91	295.17 ✓	1.37	19.2	208.6	7.34	✓17.7	8.1
	7	PB-214 / Bi-211		704.82	352.05 ✓	1.38	37.2	327.2	5.73	✓33.7	6.5
	8	BI-214		1219.75	609.28 ✓	1.60	46.3	233.9	6.79	✓44.5	7.6
	9	BI-214		2242.22	1120.12 ✓	1.88	15.1	36.4	18.47	✓13.2	18.6

M - Peak is a multiplet
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0003.MC2
background description: 25K SEC BKG 4/20/97

ENGY	ISOTOPE	CPS→DPS	DPS	% NET		
1120		13.2 / .15 =	87.4	48		
352 *	Pb (Bi-211)		96.1	52	52	90/.44 = 94
609 *	Pb-214	33.7 / .372 =	90.1	28	48	90.1 / 22 = 4
295		17.7 / .192 =	92.2	29		
74.8	Pb-214	4.8 / 0.0[illegible] =	77.4	24		
77.1	Pb-214	[illegible] / 0.105 =	63.8	20		

ROCK

*** P E A K   F I T   R E P O R T ***   18-NOV-97   08:22:25

		nuclide(s)	centroid channel	energy keV	FWHM keV	AAB %	net area counts	error %	gammas per second	error %
	1		96.89	48.59	1.15		26.3	62.22	3.3	75.91
	2	NATURAL	126.32	63.28	1.10		285.0	8.50	21.0	22.69
M	3	PB-214 NATURAL	149.28	74.73	1.09		326.2	8.32	18.9	13.82
M	4	PB-214	154.11	77.14	1.09		679.2	4.97	37.9	10.75
M	5	? / Th-231	167.58	83.86	1.10	6.4	169.0	13.95	8.6	15.29
M	6	NP-237 EU-155 NATURAL CD-109	174.37	87.25	1.10		221.0	11.40	10.9	12.50
	7	NATURAL	185.10	92.60	1.14		712.1	5.01	33.6	6.44
B	7			92.60			5.6	12.49		
	8	NATURAL U-235	287.80	143.86	1.34	10.5	95.9	18.42	4.2	18.78
	9	NATURAL NATURAL	372.23	185.99	1.23		919.8	3.71	48.8	5.38
B	9			185.99			3.6	16.28		
	10	I-134 Th-227	472.36	235.98	1.39	11.5	95.5	15.26	6.4	15.83
	11		484.58	242.08	1.26		503.7	5.03	34.6	6.54
M	12	Ra-223	538.98	269.24	1.26	13.6	60.1	21.08	4.6	21.44
M	13		542.79	271.14	1.26		65.0	20.20	5.0	20.57
	14	PB-214	591.05	295.24	1.31		1017.9	3.42	86.2	4.95
	15	LA-140	659.77	329.56	1.21		23.0	39.37	2.2	39.50
	16	PB-214	704.70	351.99	1.32		1729.4	2.50	177.9	3.98
	17	BI-214	1219.93	609.37	1.53		1026.9	3.22	195.4	4.75
	18		1538.14	768.37	1.64		88.1	12.26	21.6	12.59
	19	BI-212	1572.56	785.56	1.65		27.4	26.40	6.9	26.55
	20	Y-92	1869.87	934.11	1.83		41.1	19.97	12.4	20.12
	21	BI-214	2242.55	1120.28	2.03		169.7	8.15	61.6	8.60
	22	BI-214 CO-56	2477.83	1237.77	2.15		61.9	14.87	24.9	15.16
	23	BI-214	2758.63	1377.94	1.97		47.4	16.93	21.2	17.20
	24	EU-152	2818.63	1407.88	2.00		18.0	34.90	8.2	35.03
	25	BI-214	3532.88	1763.98	2.45		140.9	8.79	80.2	9.47

M - Peak is a multiplet

B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0003.MC2

background description: 25K SEC BKG 4/20/97

	ENGY	ISOTOPE	GPS → BPS	BPS	% ACT	
	1120	Bi-214	61.6/.151	407.9	46	
*	352	Bi-214 (Pb-214)	177.9/.372	478.2	54	53
*	609	Pb-214	195.4/.463	422.0	28	47
	295	Pb-214	86.2/.192	448.9	29	
	74.8	Pb-214	18.9/.062	304.8	20	
	77.1	Pb-214	37.9/.105	360.9	24	

422 [illegible] = 441

$\frac{422.0}{22} = 19$

269	Ra-223 / [illegible]	4.6/.136		33.8
143	U-235 / [illegible] Th-230	4.2/.105		40
236	Th-227 TL-208	6.4/.115	.98	54.8

```
*************************************************************************************
*                                                                                   *
*              G A M M A   S P E C T R U M   A N A L Y S I S                        *
*                                                                                   *
*************************************************************************************

CANBERRA APOGEE V2.4

Canberra Industries, Inc.                                      1-DEC-97   14:46:49

                    A N A L Y S I S   P A R A M E T E R S

Spectrum file number         :  100.0      Sample no.             :    1.0
MCA unit number              :    2        ADC unit number        :  3.0
Detector number              :    3        Geometry number        :    6

Search threshold 1           :  2.0        Search threshold 2     :  3.0
Search  FROM channel         :   50        Search TO channel      : 4095
Id energy tolerance          :  1.0        Order of background    : linear
Smoothing factor             :    0        Random sum corr        : disabled
GRA parameter                :    0        Baseline channels      : disabled

Confidence threshold index :  0.100
Confidence levels       LLD :  1.645 (95.0%)        MDA :  1.645 (95.0%)

Analysis library        : SPF$LIBRARY:SPFANL.LIB;1
Background subtract     : enabled

Sample description      : CARPET 3              Analyzed by: SJW

 Sample size            :  1.000000E+00  EA       Conv. factor    :    1.000
 Standard size          :  1.000000E+00  EA

Sample taken on         : 01-DEC-97    at  13:00:00
Collect started on      : 01-DEC-97    at  14:29:27
Decay time              :        89.4 minutes

live time               :   1000.0  seconds    real time      :   1000.0  seconds
dead time               :  0.00 %

Energy     calibration used done on   12 /  1 / 1997
Efficiency calibration used done on   11 / 18 / 1996
```

*** P E A K S E A R C H R E P O R T *** 1-DEC-97 14:46:49

first search channel : 50
last search channel : 4095
first significance limit for found peaks: 2.00
second significance limit for found peaks: 3.00
average Gaussian peak width (in channels): 1.56

i	peak channel	peak energy	signif of peak	check-1 signif	check-2 shape	accept channels	number
1	127.350	63.8	2.088	small	check		
2	149.517	74.9	2.190	small	check		
3	154.450	77.3	3.906			154	1
4	184.755	92.4	4.454			185	2
5	288.370	144.2	2.010	small	check		
6	372.225	186.0	3.514			372	3
7	410.468	205.1	2.068	small			
8	484.465	242.1	5.002			484	4
9	542.931	271.3	2.397	small			
10	591.161	295.4	6.373			591	5
11	704.514	352.0	8.054			705	6
12	793.582	396.5	2.193	small			
13	1220.086	609.7	7.389			1220	7
14	1332.082	665.7	2.223	small	check		
15	1629.902	814.6	2.376	small			
16	2241.827	1120.5	3.653		check	2242	8
17	2819.069	1408.9	2.134	small	check		

*** P E A K F I T R E P O R T *** 1-DEC-97 14:46:49

peak no.		nuclide(s)	centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	erro %
	1	PB-214	154.45	77.32	1.17	60.0	20.08	2.9	21.2
	2	NATURAL	184.76	92.45	1.26	60.3	17.51	2.6	17.9
B	2			92.45		5.6	12.49		
	3	NATURAL NATURAL	372.22	186.05	1.42	71.1	14.38	3.4	14.6
B	3			186.05		3.6	16.28		
	4		484.46	242.10	1.26	65.9	14.24	4.1	14.6
	5	PB-214	591.16	295.40	1.43	139.3	9.01	11.1	9.6
	6	PB-214	704.51	352.03	1.38	223.9	6.99	21.9	7.7
	7	BI-214	1220.09	609.72	1.62	169.7	7.94	30.7	8.9
	8	BI-214	2241.83	1120.49	1.87	32.6	19.78	11.3	19.9

B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0003.MC2
background description: 25K SEC BKG 4/20/97

INF: no found peak matched with library lines

*** R A D I O N U C L I D E R E P O R T *** 1-DEC-97 14:46:49

mple description :CARPET 3
..nalyzed by :SJW

number	nuclide	conf.value	Activity (uCi/EA) measured	decay corrected	
These peaks were not identified					
number	channel	energy	peak intensity (gps)		
1	154.5	77.32	2.8745E+00 +-6.12E-01	PB-214	
2	184.8	92.45	2.3476E+00 +-4.64E-01	NATURAL	
3	372.2	186.05	3.2103E+00 +-5.00E-01	NATURAL	NATURAL
4	484.5	242.10	4.0715E+00 +-5.95E-01		
5	591.2	295.40	1.1122E+01 +-1.07E+00	PB-214	
6	704.5	352.03	2.1917E+01 +-1.69E+00	PB-214	
7	1220.1	609.72	3.0719E+01 +-2.63E+00	BI-214	
8	2241.8	1120.49	1.1259E+01 +-2.25E+00	BI-214	

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 1-DEC-97 14:46:49

Sample description :CARPET 3
Analyzed by :SJW

		MDA (uCi/EA) measured	decay corrected
NA-24	MDA	1.37E-04	1.47E-04
AR-41	MDA	1.43E-04	2.51E-04
CR-51	MDA	7.48E-04	7.49E-04
MN-54	MDA	1.50E-04	1.50E-04
MN-56	MDA	9.93E-05	1.48E-04
CO-57	MDA	5.68E-05	5.68E-05
CO-58	MDA	1.39E-04	1.39E-04
FE-59	MDA	2.57E-04	2.57E-04
CO-60	MDA	1.84E-04	1.84E-04
CU-64	MDA	3.64E-02	3.95E-02
NI-65	MDA	7.92E-04	1.19E-03
ZN-65	MDA	2.90E-04	2.90E-04
SE-75	MDA	7.81E-05	7.82E-05
BR-84	MDA	3.48E-04	2.44E-03
KR-85	MDA	2.25E-02	2.25E-02
SR-85	MDA	9.82E-05	9.82E-05
KR-85M	MDA	6.90E-05	8.69E-05
[illegible]-87	MDA	1.91E-04	4.30E-04
[illegible]-88	MDA	2.02E-04	2.90E-04
Y-88	MDA	4.18E-05	4.18E-05
RB-88	MDA	1.94E-04	6.32E-03
RB-89	MDA	2.78E-04	1.54E-02
KR-89	MDA	1.01E-03	3.37E+05
Y-91M	MDA	9.09E-05	3.16E-04
SR-91	MDA	4.74E-04	5.29E-04
Y-92	MDA	1.22E-03	1.63E-03
SR-92	MDA	2.50E-04	3.67E-04
Y-93	MDA	8.31E-04	9.21E-04
Y-94	MDA	2.36E-04	6.50E-03
Y-95	MDA	8.85E-04	3.64E-01
NB-95	MDA	1.41E-04	1.41E-04
NB-95M	MDA	2.19E-04	2.22E-04
ZR-95	MDA	2.14E-04	2.14E-04
ZR-97	MDA	1.42E-03	1.51E-03
NB-97	MDA	1.02E-04	2.41E-04
MO-99	MDA	7.75E-04	7.87E-04
TC-99M	MDA	5.98E-05	6.08E-05
MO-101	MDA	2.82E-04	1.96E-02
TC-101	MDA	8.52E-05	6.71E-03
TC-102M	MDA	2.51E-04	3.89E+02
RU-103	MDA	1.05E-04	1.06E-04
TC-104	MDA	9.74E-05	2.99E-03
[illegible]H-105	MDA	3.99E-04	4.11E-04
[illegible]-105	MDA	1.91E-04	2.41E-04
[illegible]H-106	MDA	8.89E-04	8.89E-04
RU-106	MDA	8.89E-04	8.89E-04
AG-108M	MDA	8.12E-05	8.12E-05

CD-109	MDA	2.13E-03	2.13E-03
AG-110M	MDA	1.06E-04	1.06E-04
SN-113	MDA	1.43E-04	1.43E-04
[illegible]-122	MDA	1.39E-04	1.42E-04
[illegible]124	MDA	8.60E-05	8.61E-05
[illegible]-125	MDA	3.08E-04	3.08E-04
[illegible]-131M	MDA	3.53E-04	3.65E-04
XE-131M	MDA	2.39E-03	2.40E-03
SB-131	MDA	2.83E-04	4.17E-03
I-131	MDA	8.65E-05	8.69E-05
TE-131	MDA	7.30E-05	8.72E-04
I-132	MDA	1.13E-04	1.78E-04
TE-132	MDA	6.06E-05	6.14E-05
BA-133	MDA	2.60E-04	2.60E-04
TE-133	MDA	9.43E-05	1.37E-02
I-133	MDA	1.09E-04	1.15E-04
XE-133M	MDA	5.52E-04	5.63E-04
XE-133	MDA	2.34E-04	2.36E-04
TE-133M	MDA	1.51E-04	4.62E-04
TE-134	MDA	2.17E-04	9.57E-04
I-134	MDA	1.10E-04	3.56E-04
CS-134	MDA	1.44E-04	1.44E-04
I-135	MDA	5.52E-04	6.46E-04
XE-135M	MDA	1.07E-04	6.04E-03
XE-135	MDA	5.99E-05	6.71E-05
CS-136	MDA	1.35E-04	1.36E-04
CS-137	MDA	1.30E-04	1.30E-04
CS-138	MDA	2.36E-04	1.62E-03
XE-138	MDA	1.85E-04	1.49E-02
[illegible]S-139	MDA	3.08E-03	2.25E+00
[illegible]-139	MDA	2.78E-04	5.86E-04
[illegible]-138M	MDA	1.10E-03	2.12E+06
CE-139	MDA	5.91E-05	5.91E-05
BA-140	MDA	3.82E-04	3.84E-04
LA-140	MDA	2.14E-04	2.15E-04
BA-141	MDA	1.35E-04	4.02E-03
LA-141	MDA	6.49E-03	8.43E-03
CE-141	MDA	1.05E-04	1.05E-04
BA-142	MDA	3.22E-04	1.06E-01
LA-142	MDA	1.71E-04	3.28E-04
CE-143	MDA	3.32E-04	3.42E-04
PR-144	MDA	7.65E-03	7.65E-03
CE-144	MDA	4.38E-04	4.38E-04
PR-146	MDA	1.91E-04	2.53E-03
CE-146	MDA	1.23E-04	1.06E-02
ND-147	MDA	2.90E-04	2.91E-04
PR-147	MDA	3.06E-04	2.93E-02
PM-149	MDA	2.34E-03	2.39E-03
EU-152	MDA	1.68E-04	1.68E-04
HF-181	MDA	1.13E-04	1.13E-04
W-187	MDA	3.51E-04	3.66E-04
HG-203	MDA	6.56E-05	6.57E-05
NP-237	MDA	5.95E-04	5.95E-04
U-237	MDA	1.87E-04	1.89E-04
NP-239	MDA	2.15E-04	2.19E-04
[illegible]M-241	MDA	2.19E-04	2.19E-04
[illegible]-154	MDA	1.22E-04	1.22E-04
[illegible]U-155	MDA	2.20E-04	2.20E-04
NB-94	MDA	1.11E-04	1.11E-04

G A M M A S P E C T R U M A N A L Y S I S

CANBERRA APOGEE V2.4

Canberra Industries, Inc. 1-DEC-97 14:26:25

A N A L Y S I S P A R A M E T E R S

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 2	ADC unit number	: 3.0
Detector number	: 3	Geometry number	: 6
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 1.0	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
GRA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : CARPET 2 Analyzed by: SJW

mple size	: 1.000000E+00 EA	Conv. factor	: 1.000
andard size	: 1.000000E+00 EA		

Sample taken on : 01-DEC-97 at 13:00:00
Collect started on : 01-DEC-97 at 14:09:04
Decay time : 69.1 minutes

live time	: 1000.0 seconds	real time	: 1000.0 seconds
dead time	: 0.00 %		

Energy calibration used done on 12 / 1 / 1997
Efficiency calibration used done on 11 / 18 / 1996

*** P E A K S E A R C H R E P O R T *** 1-DEC-97 14:26:25

first search channel :	50
last search channel :	4095
first significance limit for found peaks:	2.00
second significance limit for found peaks:	3.00
average Gaussian peak width (in channels):	1.56

i	peak channel	peak energy	signif of peak	check-1 signif	check-2 shape	accept channels	number
1	149.383	74.8	2.045	small			
2	154.392	77.3	4.792			154	1
3	158.634	79.4	2.177	small			
4	174.258	87.2	3.255			174	2
5	185.609	92.9	3.356		check	186	3
6	372.289	186.1	5.619			372	4
7	381.657	190.8	2.028	small			
8	455.128	227.5	2.204	small			
9	477.812	238.8	2.264	small			
10	484.466	242.1	5.635			484	5
11	517.684	258.7	2.685	small			
12	591.059	295.4	8.184			591	6
13	651.857	325.7	2.079	small			
14	704.706	352.1	10.070			705	7
15	975.849	487.6	2.278	small	check		
16	982.278	490.8	2.418	small			
17	1219.936	609.6	9.579			1220	8
18	1332.927	666.1	2.143	small			
19	1370.871	685.1	2.015	small			
20	1537.905	768.6	2.987	small			
21	1614.065	806.7	2.231	small			
22	1969.143	984.2	2.034	small			
23	2242.576	1120.9	3.627		check	2243	9
24	2479.396	1239.2	2.716	small	check		
25	3462.214	1729.8	2.643	small			
26	3532.422	1764.8	2.910	small	check		

*** P E A K F I T R E P O R T *** 1-DEC-97 14:26:25

peak no.	nuclide(s)	centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	erro %
1	PB-214	154.39	77.29	1.17	80.3	17.72	3.8	19.(
2	NP-237 EU-155 NATURAL CD-109	174.26	87.21	1.16	36.0	28.34	1.6	28.7
3	NATURAL	185.61	92.87	1.26	53.9	20.27	2.3	20.6
B 3			92.87		5.6	12.49		
4	NATURAL NATURAL	372.29	186.08	1.33	126.4	10.35	6.0	10.9
B 4			186.08		3.6	16.28		
5		484.47	242.10	1.29	91.3	12.48	5.6	12.9
6	PB-214	591.06	295.35	1.41	191.0	7.84	15.3	8.5
7	PB-214	704.71	352.13	1.37	378.5	5.39	37.1	6.3
8	BI-214	1219.94	609.64	1.61	237.5	6.72	43.0	7.4
9	BI-214	2242.58	1120.87	1.86	38.7	17.67	13.3	17.8

B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0003.MC2
background description: 25K SEC BKG 4/20/97

*** R A D I O N U C L I D E R E P O R T *** 1-DEC-97 14:26:25

mple description :CARPET 2
...alyzed by :SJW

number	nuclide	conf.value	Activity (uCi/EA) measured	decay corrected
1. Fission gases				
	total		0.00E+00	0.00E+00
2. Iodines				
	total		0.00E+00	0.00E+00
3. Particulates				
1	CD-109 ?	0.8963	1.20E-03 +-3.44E-04	1.20E-03 +-3.44E-04
2	EU-155 ?	0.3281	1.27E-04 +-3.64E-05	1.27E-04 +-3.64E-05
3	NP-237 ?	0.6570	3.42E-04 +-9.82E-05	3.42E-04 +-9.82E-05
	total		1.66E-03	1.66E-03

? = nuclides with a common single line, cannot identify which one is present

These peaks were not identified

Jmber	channel	energy	peak intensity (gps)	
1	154.4	77.29	3.8489E+00 +-7.34E-01	PB-214
3	185.6	92.87	2.0692E+00 +-4.76E-01	NATURAL
4	372.3	186.08	5.8425E+00 +-6.56E-01	NATURAL NATURAL
5	484.5	242.10	5.6383E+00 +-7.28E-01	
6	591.1	295.35	1.5253E+01 +-1.31E+00	PB-214
7	704.7	352.13	3.7065E+01 +-2.34E+00	PB-214
8	1219.9	609.64	4.2996E+01 +-3.21E+00	BI-214
9	2242.6	1120.87	1.3344E+01 +-2.38E+00	BI-214

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 1-DEC-97 14:26:25

Sample description :CARPET 2
Analyzed by :SJW

		MDA (uCi/EA) measured	decay corrected
NA-24	MDA	2.23E-04	2.35E-04
AR-41	MDA	1.82E-04	2.81E-04
CR-51	MDA	7.92E-04	7.93E-04
MN-54	MDA	1.29E-04	1.29E-04
MN-56	MDA	1.89E-04	2.58E-04
CO-57	MDA	6.59E-05	6.59E-05
CO-58	MDA	1.54E-04	1.54E-04
FE-59	MDA	3.35E-04	3.36E-04
CO-60	MDA	1.77E-04	1.77E-04
CU-64	MDA	3.45E-02	3.67E-02
NI-65	MDA	8.79E-04	1.21E-03
ZN-65	MDA	4.30E-04	4.30E-04
SE-75	MDA	9.09E-05	9.09E-05
BR-84	MDA	3.97E-04	1.79E-03
KR-85	MDA	2.97E-02	2.97E-02
SR-85	MDA	1.30E-04	1.30E-04
KR-85M	MDA	7.80E-05	9.32E-05
[illegible]-87	MDA	2.24E-04	4.19E-04
[illegible]-88	MDA	2.41E-04	3.19E-04
Y-88	MDA	1.50E-04	1.50E-04
RB-88	MDA	7.72E-04	1.14E-02
RB-89	MDA	3.15E-04	6.99E-03
KR-89	MDA	1.31E-03	4.99E+03
Y-91M	MDA	1.23E-04	3.23E-04
SR-91	MDA	5.18E-04	5.64E-04
Y-92	MDA	1.36E-03	1.71E-03
SR-92	MDA	2.95E-04	3.97E-04
Y-93	MDA	1.06E-03	1.14E-03
Y-94	MDA	3.32E-04	4.30E-03
Y-95	MDA	8.36E-04	8.72E-02
NB-95	MDA	1.94E-04	1.95E-04
NB-95M	MDA	2.90E-04	2.93E-04
ZR-95	MDA	2.51E-04	2.51E-04
ZR-97	MDA	2.19E-03	2.30E-03
NB-97	MDA	9.44E-05	1.83E-04
MO-99	MDA	9.47E-04	9.59E-04
TC-99M	MDA	7.48E-05	7.57E-05
MO-101	MDA	3.06E-04	8.10E-03
TC-101	MDA	9.21E-05	2.68E-03
TC-102M	MDA	3.12E-04	1.88E+01
RU-103	MDA	1.05E-04	1.06E-04
TC-104	MDA	1.17E-04	1.65E-03
[illegible]H-105	MDA	3.95E-04	4.04E-04
[illegible]-105	MDA	2.83E-04	3.39E-04
[illegible]-106	MDA	1.14E-03	1.15E-03
RU-106	MDA	1.14E-03	1.15E-03
AG-108M	MDA	1.12E-04	1.12E-04

CD-109	:	MDA	: 2.34E-03	2.34E-03
AG-110M	:	MDA	: 9.80E-05	9.80E-05
SN-113	:	MDA	: 1.65E-04	1.65E-04
[illegible]-122	:	MDA	: 1.77E-04	1.79E-04
[illegible]-124	:	MDA	: 1.24E-04	1.24E-04
[illegible]-125	:	MDA	: 3.22E-04	3.22E-04
[illegible]-131M	:	MDA	: 4.87E-04	5.00E-04
XE-131M	:	MDA	: 2.87E-03	2.88E-03
SB-131	:	MDA	: 2.95E-04	2.36E-03
I-131	:	MDA	: 1.15E-04	1.15E-04
TE-131	:	MDA	: 8.19E-05	5.56E-04
I-132	:	MDA	: 1.40E-04	1.98E-04
TE-132	:	MDA	: 8.03E-05	8.11E-05
BA-133	:	MDA	: 2.97E-04	2.97E-04
TE-133	:	MDA	: 1.09E-04	5.10E-03
I-133	:	MDA	: 1.31E-04	1.36E-04
XE-133M	:	MDA	: 7.15E-04	7.26E-04
XE-133	:	MDA	: 2.67E-04	2.69E-04
TE-133M	:	MDA	: 1.99E-04	4.72E-04
TE-134	:	MDA	: 2.86E-04	9.00E-04
I-134	:	MDA	: 1.96E-04	4.87E-04
CS-134	:	MDA	: 1.83E-04	1.83E-04
I-135	:	MDA	: 5.84E-04	6.58E-04
XE-135M	:	MDA	: 1.21E-04	2.73E-03
XE-135	:	MDA	: 7.31E-05	7.97E-05
CS-136	:	MDA	: 1.44E-04	1.44E-04
CS-137	:	MDA	: 1.37E-04	1.37E-04
CS-138	:	MDA	: 2.22E-04	9.81E-04
XE-138	:	MDA	: 2.48E-04	7.33E-03
[illegible]-139	:	MDA	: 3.35E-03	5.46E-01
[illegible]-139	:	MDA	: 3.14E-04	5.59E-04
[illegible]-138M	:	MDA	: 1.19E-03	1.76E+04
CE-139	:	MDA	: 6.69E-05	6.69E-05
BA-140	:	MDA	: 4.58E-04	4.59E-04
LA-140	:	MDA	: 2.22E-04	2.22E-04
BA-141	:	MDA	: 1.55E-04	2.13E-03
LA-141	:	MDA	: 6.85E-03	8.39E-03
CE-141	:	MDA	: 1.18E-04	1.18E-04
BA-142	:	MDA	: 4.01E-04	3.52E-02
LA-142	:	MDA	: 2.04E-04	3.37E-04
CE-143	:	MDA	: 3.86E-04	3.95E-04
PR-144	:	MDA	: 1.11E-02	1.11E-02
CE-144	:	MDA	: 5.15E-04	5.15E-04
PR-146	:	MDA	: 2.22E-04	1.63E-03
CE-146	:	MDA	: 1.44E-04	4.50E-03
ND-147	:	MDA	: 3.13E-04	3.14E-04
PR-147	:	MDA	: 3.51E-04	1.19E-02
PM-149	:	MDA	: 2.62E-03	2.66E-03
EU-152	:	MDA	: 1.99E-04	1.99E-04
HF-181	:	MDA	: 1.12E-04	1.12E-04
W-187	:	MDA	: 4.62E-04	4.78E-04
HG-203	:	MDA	: 9.69E-05	9.70E-05
NP-237	:	MDA	: 6.83E-04	6.83E-04
U-237	:	MDA	: 2.21E-04	2.22E-04
NP-239	:	MDA	: 2.34E-04	2.37E-04
[illegible]M-241	:	MDA	: 2.67E-04	2.67E-04
[illegible]-154	:	MDA	: 1.31E-04	1.31E-04
EU-155	:	MDA	: 2.53E-04	2.53E-04
NB-94	:	MDA	: 1.57E-04	1.57E-04

G A M M A S P E C T R U M A N A L Y S I S

NBERRA APOGEE V2.4

Canberra Industries, Inc. 1-DEC-97 14:05:54

A N A L Y S I S P A R A M E T E R S

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 2	ADC unit number	: 3.0
Detector number	: 3	Geometry number	: 6
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 1.0	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
GRA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : CARPET Analyzed by: SJW

mple size : 1.000000E+00 EA Conv. factor : 1.000
andard size : 1.000000E+00 EA

Sample taken on : 01-DEC-97 at 13:00:00
Collect started on : 01-DEC-97 at 13:48:33
Decay time : 48.5 minutes

live time : 1000.0 seconds real time : 1000.0 seconds
dead time : 0.00 %

Energy calibration used done on 12 / 1 / 1997
Efficiency calibration used done on 11 / 18 / 1996

*** P E A K S E A R C H R E P O R T *** 1-DEC-97 14:05:54

first search channel :	50
last search channel :	4095
first significance limit for found peaks:	2.00
second significance limit for found peaks:	3.00
average Gaussian peak width (in channels):	1.56

i	peak channel	peak energy	signif of peak	check-1 signif	check-2 shape	accept channels	number
1	126.174	63.2	2.996	small	check		
2	149.324	74.8	3.057			149	1
3	154.346	77.3	4.757			154	2
4	185.287	92.7	2.802	small			
5	287.749	143.9	2.006	small	check		
6	372.366	186.1	4.176			372	3
7	398.046	198.9	2.379	small			
8	484.248	242.0	4.453			484	4
9	512.926	256.3	2.189	small			
10	591.079	295.4	7.732			591	5
11	704.567	352.1	8.362			705	6
12	731.689	365.6	2.097	small	check		
13	798.190	398.8	2.421	small			
14	859.328	429.4	2.011	small	check		
15	1126.022	562.7	2.150	small			
16	1219.775	609.6	7.846			1220	7
17	1227.908	613.6	2.365	small			
18	1518.849	759.1	2.000	small			
19	1645.068	822.2	2.238	small	check		
20	2242.700	1120.9	3.175		check	2243	8
21	2478.387	1238.7	2.567	small	check		
22	3218.000	1608.0	2.183	small			
23	3532.001	1764.6	3.384		check	3532	9

*** P E A K F I T R E P O R T *** 1-DEC-97 14:05:54

	peak no.	nuclide(s)	centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	erro %
M	1	PB-214 NATURAL	149.32	74.76	1.09	55.3	19.46	2.7	20.9
M	2	PB-214	154.35	77.27	1.09	111.4	11.98	5.3	13.9
	3	NATURAL NATURAL	372.37	186.12	1.40	110.2	11.21	5.2	11.7
B	3			186.12		3.6	16.28		
	4		484.25	242.00	1.45	80.5	12.77	5.0	13.1
	5	PB-214	591.08	295.36	1.40	172.2	8.20	13.7	8.9
	6	PB-214	704.57	352.06	1.47	279.4	6.27	27.4	7.0
	7	BI-214	1219.78	609.56	1.65	205.3	7.22	37.2	7.9
	8	BI-214	2242.70	1120.93	2.07	30.1	20.64	10.4	20.8
	9	BI-214	3532.00	1764.56	2.29	30.3	20.32	16.5	20.6

M - Peak is a multiplet
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0003.MC2
background description: 25K SEC BKG 4/20/97

INF: no found peak matched with library lines

*** R A D I O N U C L I D E R E P O R T *** 1-DEC-97 14:05:54

mple description :CARPET
alyzed by :SJW

number	nuclide	conf.value	Activity (uCi/EA) measured	decay corrected		
These peaks were not identified						
number	channel	energy	peak intensity (gps)			
1	149.3	74.76	2.7242E+00	+-5.71E-01	PB-214	NATURAL
2	154.3	77.27	5.3378E+00	+-7.42E-01	PB-214	
3	372.4	186.12	5.0717E+00	+-6.15E-01	NATURAL	NATURAL
4	484.2	242.00	4.9723E+00	+-6.56E-01		
5	591.1	295.36	1.3749E+01	+-1.23E+00	PB-214	
6	704.6	352.06	2.7355E+01	+-1.94E+00	PB-214	
7	1219.8	609.56	3.7163E+01	+-2.94E+00	BI-214	
8	2242.7	1120.93	1.0386E+01	+-2.16E+00	BI-214	
9	3532.0	1764.56	1.6548E+01	+-3.41E+00	BI-214	

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 1-DEC-97 14:05:54

ample description :CARPET
Analyzed by :SJW

		MDA (uCi/EA) measured	decay corrected
NA-24	MDA	1.91E-04	1.98E-04
AR-41	MDA	1.54E-04	2.09E-04
CR-51	MDA	7.66E-04	7.66E-04
MN-54	MDA	1.34E-04	1.34E-04
MN-56	MDA	1.46E-04	1.81E-04
CO-57	MDA	5.16E-05	5.16E-05
CO-58	MDA	1.35E-04	1.35E-04
FE-59	MDA	3.15E-04	3.15E-04
CO-60	MDA	1.77E-04	1.77E-04
CU-64	MDA	4.16E-02	4.35E-02
NI-65	MDA	9.19E-04	1.15E-03
ZN-65	MDA	4.30E-04	4.30E-04
SE-75	MDA	9.05E-05	9.05E-05
BR-84	MDA	3.79E-04	1.09E-03
KR-85	MDA	2.75E-02	2.75E-02
SR-85	MDA	1.20E-04	1.20E-04
KR-85M	MDA	7.24E-05	8.20E-05
-87	MDA	2.22E-04	3.45E-04
-88	MDA	2.05E-04	2.49E-04
Y-88	MDA	1.14E-04	1.14E-04
RB-88	MDA	5.28E-04	3.49E-03
RB-89	MDA	3.31E-04	2.93E-03
KR-89	MDA	1.13E-03	4.75E+01
Y-91M	MDA	9.95E-05	1.96E-04
SR-91	MDA	4.63E-04	4.91E-04
Y-92	MDA	1.18E-03	1.39E-03
SR-92	MDA	2.95E-04	3.63E-04
Y-93	MDA	1.01E-03	1.07E-03
Y-94	MDA	2.46E-04	1.49E-03
Y-95	MDA	9.77E-04	2.56E-02
NB-95	MDA	1.71E-04	1.71E-04
NB-95M	MDA	2.45E-04	2.46E-04
ZR-95	MDA	2.03E-04	2.03E-04
ZR-97	MDA	2.16E-03	2.23E-03
NB-97	MDA	1.12E-04	1.79E-04
MO-99	MDA	7.94E-04	8.00E-04
TC-99M	MDA	6.17E-05	6.23E-05
MO-101	MDA	2.80E-04	2.80E-03
TC-101	MDA	8.52E-05	9.11E-04
TC-102M	MDA	3.24E-04	7.43E-01
RU-103	MDA	1.01E-04	1.01E-04
TC-104	MDA	1.06E-04	6.80E-04
H-105	MDA	3.95E-04	4.01E-04
-105	MDA	2.70E-04	3.06E-04
-106	MDA	1.09E-03	1.09E-03
RU-106	MDA	1.09E-03	1.09E-03
AG-108M	MDA	1.01E-04	1.01E-04

CD-109	MDA	2.29E-03	2.29E-03
AG-110M	MDA	1.17E-04	1.17E-04
SN-113	MDA	1.45E-04	1.45E-04
-122	MDA	1.56E-04	1.57E-04
-124	MDA	1.19E-04	1.19E-04
-125	MDA	3.03E-04	3.03E-04
-131M	MDA	4.60E-04	4.68E-04
XE-131M	MDA	2.90E-03	2.91E-03
SB-131	MDA	3.41E-04	1.47E-03
I-131	MDA	9.70E-05	9.73E-05
TE-131	MDA	7.52E-05	2.89E-04
I-132	MDA	1.26E-04	1.61E-04
TE-132	MDA	6.86E-05	6.91E-05
BA-133	MDA	2.83E-04	2.83E-04
TE-133	MDA	9.69E-05	1.45E-03
I-133	MDA	1.22E-04	1.25E-04
XE-133M	MDA	5.77E-04	5.83E-04
XE-133	MDA	2.54E-04	2.55E-04
TE-133M	MDA	1.79E-04	3.29E-04
TE-134	MDA	2.74E-04	6.13E-04
I-134	MDA	1.51E-04	2.87E-04
CS-134	MDA	1.54E-04	1.54E-04
I-135	MDA	4.42E-04	4.81E-04
XE-135M	MDA	1.24E-04	1.11E-03
XE-135	MDA	6.35E-05	6.75E-05
CS-136	MDA	1.51E-04	1.51E-04
CS-137	MDA	1.51E-04	1.51E-04
CS-138	MDA	2.62E-04	7.46E-04
XE-138	MDA	2.35E-04	2.54E-03
CS-139	MDA	2.55E-03	9.15E-02
-139	MDA	3.16E-04	4.74E-04
-138M	MDA	1.09E-03	1.19E+02
CE-139	MDA	6.73E-05	6.73E-05
BA-140	MDA	4.18E-04	4.19E-04
LA-140	MDA	2.33E-04	2.33E-04
BA-141	MDA	1.49E-04	9.39E-04
LA-141	MDA	7.84E-03	9.03E-03
CE-141	MDA	1.19E-04	1.19E-04
BA-142	MDA	3.53E-04	8.20E-03
LA-142	MDA	2.15E-04	3.07E-04
CE-143	MDA	3.57E-04	3.63E-04
PR-144	MDA	8.99E-03	8.99E-03
CE-144	MDA	4.97E-04	4.97E-04
PR-146	MDA	2.01E-04	8.17E-04
CE-146	MDA	1.39E-04	1.56E-03
ND-147	MDA	3.14E-04	3.15E-04
PR-147	MDA	3.15E-04	3.74E-03
PM-149	MDA	2.37E-03	2.40E-03
EU-152	MDA	1.57E-04	1.57E-04
HF-181	MDA	1.26E-04	1.26E-04
W-187	MDA	4.23E-04	4.33E-04
HG-203	MDA	8.76E-05	8.76E-05
NP-237	MDA	6.63E-04	6.63E-04
U-237	MDA	1.95E-04	1.96E-04
NP-239	MDA	2.04E-04	2.06E-04
M-241	MDA	2.67E-04	2.67E-04
-154	MDA	1.09E-04	1.09E-04
EU-155	MDA	2.41E-04	2.41E-04
NB-94	MDA	1.25E-04	1.25E-04

```
**********************************************************************************
*                                                                                *
*              G A M M A   S P E C T R U M   A N A L Y S I S                     *
*                                                                                *
**  **********************************************************************************

L   ERRA APOGEE V2.4

Canberra Industries, Inc.                                   2-DEC-97   19:54:50

                    A N A L Y S I S   P A R A M E T E R S

Spectrum file number        :  100.0        Sample no.              :    1.0
MCA unit number             :    1          ADC unit number         :  1.0
Detector number             :    1          Geometry number         :    6

Search threshold 1          :  2.0          Search threshold 2      :  3.0
Search  FROM channel        :   50          Search TO channel       : 4095
Id energy tolerance         :  1.0          Order of background     : linear
Smoothing factor            :    0          Random sum corr         : disabled
GRA parameter               :    0          Baseline channels       : disabled

Confidence threshold index :  0.100
Confidence levels      LLD :  1.645 (95.0%)        MDA :  1.645 (95.0%)

Analysis library       : SPF$LIBRARY:SPFANL.LIB;1
Background subtract    : enabled

Sample description     : CARPET #1                  Analyzed by: SLC

S ole size             :  1.000000E+00  EA       Conv. factor    :    1.000
    dard size          :  1.000000E+00  EA

Sample taken on        : 02-DEC-97    at  12:00:00
Collect started on     : 02-DEC-97    at  12:00:00
Decay time             :          0.0 minutes

live time              :   3000.0  seconds     real time      :   3000.0  seconds
dead time              :  0.00 %

Energy     calibration used done on   12 /  2 / 1997
Efficiency calibration used done on   11 / 16 / 1996
```

*** P E A K S E A R C H R E P O R T *** 2-DEC-97 19:54:50

f: t search channel : 50
last search channel : 4095
first significance limit for found peaks: 2.00
second significance limit for found peaks: 3.00
average Gaussian peak width (in channels): 1.49

i	peak channel	peak energy	signif of peak	check-1 signif	check-2 shape	accept channels	number
1	116.000	58.0	2.069	small	check		
2	126.535	63.3	3.040			127	1
3	149.616	74.8	3.256		check	150	2
4	154.070	77.0	6.451			154	3
5	167.883	84.0	2.242	small	check		
6	174.609	87.3	3.304			175	4
7	184.952	92.5	6.193			185	5
8	254.642	127.4	2.551	small			
9	288.003	144.0	2.813	small			
10	307.980	154.0	2.031	small	check		
11	317.742	158.9	2.056	small	check		
12	371.725	185.9	6.060			372	6
13	458.349	229.2	2.207	small			
	477.122	238.6	2.211	small	check		
	483.676	241.9	6.784			484	7
	499.659	249.9	2.640	small			
17	590.211	295.2	9.570			590	8
18	703.789	352.0	10.526			704	9
19	1051.137	525.7	2.085	small			
20	1218.206	609.3	11.035			1218	10
21	1322.791	661.6	2.469	small			
22	1330.273	665.3	2.328	small	check		
23	1359.696	680.1	2.066	small			
24	1383.756	692.1	2.290	small	check		
25	1500.993	750.7	2.256	small	check		
26	1536.449	768.4	2.085	small	check		
27	1545.055	772.7	2.513	small			
28	1625.552	813.0	2.077	small	check		
29	1741.863	871.1	2.043	small	check		
30	2001.842	1001.1	3.078		check	2002	11
31	2009.855	1005.1	2.153	small			
32	2048.229	1024.3	2.000	small	check		
33	2240.269	1120.3	4.711			2240	12
34	2346.342	1173.3	3.660		check	2346	13
35	2476.246	1238.2	3.217		check	2476	14
36	2665.360	1332.6	2.221	small			
37	2756.007	1377.9	3.195		check	2756	15
38	2921.993	1460.8	2.019	small			
39	3069.963	1534.6	2.047	small	check		
	3460.777	1729.6	2.134	small			
	3530.362	1764.3	3.789			3530	16
42	3876.965	1937.1	2.169	small	check		

*** P E A K F I T R E P O R T *** 2-DEC-97 19:54:50

	ak.	nuclide(s)		centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	error %
	1	NATURAL		126.54	63.28	1.18	52.3	21.14	0.5	29.78
B	1				63.28		24.0	6.65		
M	2	PB-214	NATURAL	149.62	74.82	1.08	85.9	15.45	0.8	18.94
B	2				74.82		6.2	20.88		
M	3	PB-214		154.07	77.05	1.08	183.6	9.34	1.6	13.36
	4	NP-237	EU-155	174.61	87.32	1.10	30.2	36.23	0.2	36.59
		NATURAL	CD-109							
	5	NATURAL		184.95	92.49	1.31	154.6	10.40	1.2	11.16
B	5				92.49		56.1	3.95		
	6	NATURAL	NATURAL	371.73	185.91	1.33	153.4	9.74	1.5	10.48
B	6				185.91		38.0	4.93		
	7			483.68	241.91	1.26	105.7	12.17	1.2	12.86
	8	PB-214		590.21	295.20	1.22	281.5	6.33	4.0	7.26
	9	PB-214		703.79	352.01	1.30	431.6	5.13	7.2	5.98
	10	BI-214		1218.21	609.30	1.41	341.6	5.56	9.6	6.55
B	10				609.30		2.5	26.59		
	11	NATURAL		2001.84	1001.10	1.63	14.9	32.97	0.7	33.06
B	11				1001.10		2.2	25.40		
	12	BI-214		2240.27	1120.26	1.90	71.8	12.67	3.6	12.96
	13	CO-60		2346.34	1173.26	1.82	24.5	24.20	1.3	24.36
B	13				1173.26		3.2	18.47		
	14	BI-214	CO-56	2476.25	1238.16	1.74	27.7	21.54	1.5	21.73
	15	BI-214		2756.01	1377.88	1.86	22.9	23.37	1.4	23.56
	16	BI-214		3530.36	1764.29	2.36	50.6	14.84	3.8	15.24

M - Peak is a multiplet
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0001.MC1
background description: 50K BKG 11/24/97

*** R A D I O N U C L I D E   R E P O R T ***   2-DEC-97   19:54:50

e description :CARPET
r /zed by :SLC

umber nuclide conf.value ---------- Activity (uCi/EA) ----------
measured decay corrected

. Fission gases

		total	0.00E+00	total	0.00E+00

?. Iodines

		total	0.00E+00	total	0.00E+00

3. Particulates

umber	nuclide	conf.value	measured		decay corrected	
1	CO-60	0.1996	3.00E-05	+-8.45E-06	3.00E-05	+-8.45E-06
2	CD-109 ?	0.9219	1.84E-04	+-6.72E-05	1.84E-04	+-6.72E-05
3	EU-155 ?	0.3038	1.95E-05	+-7.12E-06	1.95E-05	+-7.12E-06
4	NP-237 ?	0.6323	5.25E-05	+-1.92E-05	5.25E-05	+-1.92E-05
		total	2.86E-04	total	2.86E-04	

? = nuclides with a common single line, cannot identify which one is present

T' ~e peaks were not identified

number	channel	energy	peak intensity (gps)			
1	126.5	63.28	2.9297E-01	+-1.31E-01	NATURAL	
2	149.6	74.82	7.0925E-01	+-1.42E-01	PB-214	NATURAL
3	154.1	77.05	1.6000E+00	+-2.14E-01	PB-214	
5	185.0	92.49	7.7935E-01	+-1.32E-01	NATURAL	
6	371.7	185.91	1.0917E+00	+-1.49E-01	NATURAL	NATURAL
7	483.7	241.91	1.2403E+00	+-1.59E-01		
8	590.2	295.20	3.9522E+00	+-2.87E-01	PB-214	
9	703.8	352.01	7.1519E+00	+-4.28E-01	PB-214	
10	1218.2	609.30	9.5643E+00	+-6.30E-01	BI-214	
11	2001.8	1001.10	5.7164E-01	+-2.23E-01	NATURAL	
12	2240.3	1120.26	3.5936E+00	+-4.66E-01	BI-214	
14	2476.2	1238.16	1.5184E+00	+-3.30E-01	BI-214	CO-56
15	2756.0	1377.88	1.3831E+00	+-3.26E-01	BI-214	
16	3530.4	1764.29	3.7971E+00	+-5.79E-01	BI-214	

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 2-DEC-97 19:54:50

S. le description :CARPET
An..yzed by :SLC

	MDA (uCi/EA) measured	decay corrected
NA-24	MDA : 2.57E-05	2.57E-05
AR-41	MDA : 2.82E-05	2.82E-05
CR-51	MDA : 1.58E-04	1.58E-04
MN-54	MDA : 2.95E-05	2.95E-05
MN-56	MDA : 2.98E-05	2.98E-05
CO-57	MDA : 1.45E-05	1.45E-05
CO-58	MDA : 2.93E-05	2.93E-05
FE-59	MDA : 5.41E-05	5.41E-05
CU-64	MDA : 4.27E-03	4.27E-03
NI-65	MDA : 1.49E-04	1.49E-04
ZN-65	MDA : 1.08E-04	1.08E-04
SE-75	MDA : 2.03E-05	2.03E-05
BR-84	MDA : 6.46E-05	6.46E-05
KR-85	MDA : 6.79E-03	6.79E-03
SR-85	MDA : 2.97E-05	2.97E-05
KR-85M	MDA : 1.81E-05	1.81E-05
KR-87	MDA : 4.45E-05	4.45E-05
K 8	MDA : 5.35E-05	5.35E-05
\	MDA : 3.20E-05	3.20E-05
RB 8	MDA : 3.54E-04	3.54E-04
RB-89	MDA : 1.30E-04	1.30E-04
KR-89	MDA : 8.11E-04	8.11E-04
Y-91M	MDA : 1.98E-05	1.98E-05
SR-91	MDA : 9.59E-05	9.59E-05
Y-92	MDA : 2.71E-04	2.71E-04
SR-92	MDA : 5.35E-05	5.35E-05
Y-93	MDA : 2.26E-04	2.26E-04
Y-94	MDA : 1.15E-04	1.15E-04
Y-95	MDA : 5.36E-04	5.36E-04
NB-95	MDA : 3.13E-05	3.13E-05
NB-95M	MDA : 6.45E-05	6.45E-05
ZR-95	MDA : 4.25E-05	4.25E-05
ZR-97	MDA : 4.95E-04	4.95E-04
NB-97	MDA : 2.60E-05	2.60E-05
MO-99	MDA : 1.90E-04	1.90E-04
TC-99M	MDA : 1.56E-05	1.56E-05
MO-101	MDA : 1.94E-04	1.94E-04
TC-101	MDA : 4.87E-05	4.87E-05
TC-102M	MDA : 1.82E-04	1.82E-04
RU-103	MDA : 2.33E-05	2.33E-05
TC-104	MDA : 4.41E-05	4.41E-05
RH-105	MDA : 8.17E-05	8.17E-05
RU-105	MDA : 4.94E-05	4.94E-05
I 06	MDA : 1.69E-04	1.69E-04
R 06	MDA : 1.69E-04	1.69E-04
AG-108M	MDA : 1.97E-05	1.97E-05
CD-109	MDA : 4.68E-04	4.68E-04

AG-110M	MDA	2.49E-05	2.49E-05
SN-113	MDA	3.21E-05	3.21E-05
SB-122	MDA	2.82E-05	2.82E-05
SB-124	MDA	2.39E-05	2.39E-05
SE 25	MDA	5.72E-05	5.72E-05
31M	MDA	7.88E-05	7.88E-05
31M	MDA	6.69E-04	6.69E-04
SB-131	MDA	1.66E-04	1.66E-04
I-131	MDA	1.81E-05	1.81E-05
TE-131	MDA	3.74E-05	3.74E-05
I-132	MDA	2.86E-05	2.86E-05
TE-132	MDA	1.56E-05	1.56E-05
BA-133	MDA	5.54E-05	5.54E-05
TE-133	MDA	6.54E-05	6.54E-05
I-133	MDA	2.17E-05	2.17E-05
XE-133M	MDA	1.44E-04	1.44E-04
XE-133	MDA	4.98E-05	4.98E-05
TE-133M	MDA	3.46E-05	3.46E-05
TE-134	MDA	6.06E-05	6.06E-05
I-134	MDA	3.04E-05	3.04E-05
CS-134	MDA	3.20E-05	3.20E-05
I-135	MDA	9.54E-05	9.54E-05
XE-135M	MDA	6.22E-05	6.22E-05
XE-135	MDA	1.68E-05	1.68E-05
CS-136	MDA	2.98E-05	2.98E-05
CS-137	MDA	3.18E-05	3.18E-05
CS-138	MDA	4.32E-05	4.32E-05
XE-138	MDA	1.44E-04	1.44E-04
CS-139	MDA	1.81E-03	1.81E-03
BA-139	MDA	8.02E-05	8.02E-05
C 38M	MDA	8.50E-04	8.50E-04
39	MDA	1.71E-05	1.71E-05
BA 40	MDA	7.72E-05	7.72E-05
LA-140	MDA	4.03E-05	4.03E-05
BA-141	MDA	7.43E-05	7.43E-05
LA-141	MDA	1.02E-03	1.02E-03
CE-141	MDA	2.98E-05	2.98E-05
BA-142	MDA	2.85E-04	2.85E-04
LA-142	MDA	4.36E-05	4.36E-05
CE-143	MDA	7.86E-05	7.86E-05
PR-144	MDA	2.06E-03	2.06E-03
CE-144	MDA	1.10E-04	1.10E-04
PR-146	MDA	7.88E-05	7.88E-05
CE-146	MDA	8.05E-05	8.05E-05
ND-147	MDA	7.50E-05	7.50E-05
PR-147	MDA	1.99E-04	1.99E-04
PM-149	MDA	5.01E-04	5.01E-04
EU-152	MDA	4.26E-05	4.26E-05
HF-181	MDA	2.46E-05	2.46E-05
W-187	MDA	8.40E-05	8.40E-05
HG-203	MDA	1.88E-05	1.88E-05
NP-237	MDA	1.40E-04	1.40E-04
U-237	MDA	4.70E-05	4.70E-05
NP-239	MDA	5.22E-05	5.22E-05
AM-241	MDA	5.09E-05	5.09E-05
EU-154	MDA	3.01E-05	3.01E-05
155	MDA	5.19E-05	5.19E-05
4	MDA	2.39E-05	2.39E-05

```
*****************************************************************************
*                                                                           *
*            G A M M A   S P E C T R U M   A N A L Y S I S                  *
*                                                                           *
**   ************************************************************************

CANBERRA APOGEE V2.4

Canberra Industries, Inc.                                 2-DEC-97   20:54:10

                  A N A L Y S I S   P A R A M E T E R S

Spectrum file number         :  100.0      Sample no.           :    1.0
MCA unit number              :    1        ADC unit number      :  1.0
Detector number              :    1        Geometry number      :    6

Search threshold 1           :  2.0        Search threshold 2   :  3.0
Search  FROM channel         :   50        Search TO channel    : 4095
Id energy tolerance          :  1.0        Order of background  : linear
Smoothing factor             :    0        Random sum corr      : disabled
GRA parameter                :    0        Baseline channels    : disabled

Confidence threshold index :  0.100
Confidence levels       LLD :  1.645 (95.0%)       MDA :  1.645 (95.0%)

Analysis library       : SPF$LIBRARY:SPFANL.LIB;1
Background subtract    : enabled

Sample description     : CARPET #3            Analyzed by: SLC

Sample size            :  1.000000E+00   EA      Conv. factor    :    1.000
Standard size          :  1.000000E+00   EA

Sample taken on        : 02-DEC-97     at   12:00:00
Collect started on     : 02-DEC-97     at   12:00:00
Decay time             :           0.0 minutes

live time              :   3000.0  seconds    real time      :   3000.0  seconds
dead time              :   0.00 %

Energy     calibration used done on    12 /  2 / 1997
Efficiency calibration used done on    11 / 16 / 1996
```

*** P E A K S E A R C H R E P O R T *** 2-DEC-97 20:54:10

first search channel : 50
last search channel : 4095
first significance limit for found peaks: 2.00
second significance limit for found peaks: 3.00
average Gaussian peak width (in channels): 1.49

i	peak channel	peak energy	signif of peak	check-1 signif	check-2 shape	accept channels	number
1	119.000	59.5	2.033	small			
2	126.322	63.2	2.303	small			
3	153.765	76.9	2.548	small	check		
4	184.675	92.4	3.221			185	1
5	209.000	104.5	2.238	small			
6	212.949	106.5	2.021	small	check		
7	270.814	135.4	2.112	small	check		
8	371.649	185.9	3.829			372	2
9	446.832	223.5	2.011	small	check		
10	590.524	295.4	2.505	small	check		
11	703.525	351.9	2.893	small			
12	899.758	450.0	2.067	small			
13	1021.462	510.9	2.306	small			
	1218.322	609.4	2.298	small	check		
	1322.292	661.4	2.468	small	check		
[illegible]	1398.059	699.2	2.132	small			
17	1578.044	789.2	2.468	small	check		
18	1620.201	810.3	2.183	small	check		
19	1813.072	906.7	2.389	small	check		
20	2155.088	1077.7	2.419	small			
21	2279.914	1140.1	2.056	small			
22	2346.999	1173.6	4.370			2347	3
23	2665.560	1332.7	4.841			2666	4

*** P E A K F I T R E P O R T *** 2-DEC-97 20:54:10

Peak		nuclide(s)	centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	error %
	1	NATURAL	184.67	92.36	1.31	41.8	20.12	0.3	20.52
B	1			92.36		56.1	3.95		
	2	NATURAL NATURAL	371.65	185.88	1.26	42.4	19.43	0.4	19.81
B	2			185.88		38.0	4.93		
	3	CO-60	2347.00	1173.59	2.08	57.3	14.02	3.0	14.30
B	3			1173.59		3.2	18.47		
	4	CO-60	2665.56	1332.71	2.01	66.5	12.85	3.9	13.19

B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0001.MCA
background description: 50K BKG 11/24/97

*** R A D I O N U C L I D E R E P O R T *** 2-DEC-97 20:54:10

Sample description :CARPET #3
Analyzed by :SLC

number	nuclide	conf.value	Activity (uCi/EA) measured		Activity (uCi/EA) decay corrected	
1. Fission gases						
		total	0.00E+00		total	0.00E+00
2. Iodines						
		total	0.00E+00		total	0.00E+00
3. Particulates						
1	CO-60	0.9734	8.82E-05	+-8.89E-06	8.82E-05	+-8.89E-06
		total	8.82E-05		total	8.82E-05

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 2-DEC-97 20:54:10

Sample description :CARPET #3
Analyzed by :SLC

	MDA (uCi/EA) measured	MDA (uCi/EA) decay corrected
NA-24	MDA : 2.28E-05	2.28E-05
AR-41	MDA : 2.92E-05	2.92E-05
CR-51	MDA : 1.17E-04	1.17E-04
MN-54	MDA : 2.31E-05	2.31E-05
MN-56	MDA : 2.48E-05	2.48E-05
CO-57	MDA : 8.14E-06	8.14E-06
CO-58	MDA : 2.37E-05	2.37E-05
FE-59	MDA : 5.41E-05	5.41E-05
CU-64	MDA : 4.89E-03	4.89E-03
NI-65	MDA : 1.17E-04	1.17E-04
ZN-65	MDA : 5.17E-05	5.17E-05
SE-75	MDA : 1.28E-05	1.28E-05
BR-84	MDA : 5.79E-05	5.79E-05
KR-85	MDA : 5.63E-03	5.63E-03
SR-85	MDA : 2.46E-05	2.46E-05
KR-85M	MDA : 1.04E-05	1.04E-05
KR-87	MDA : 2.67E-05	2.67E-05
[illegible]	MDA : 3.06E-05	3.06E-05
[illegible]	MDA : 2.77E-05	2.77E-05
RB-[illegible]	MDA : 2.92E-04	2.92E-04
RB-89	MDA : 1.22E-04	1.22E-04
KR-89	MDA : 4.61E-04	4.61E-04
Y-91M	MDA : 1.48E-05	1.48E-05
SR-91	MDA : 7.47E-05	7.47E-05
Y-92	MDA : 1.71E-04	1.71E-04
SR-92	MDA : 2.56E-05	2.56E-05
Y-93	MDA : 1.57E-04	1.57E-04
Y-94	MDA : 1.02E-04	1.02E-04
Y-95	MDA : 5.14E-04	5.14E-04
NB-95	MDA : 2.13E-05	2.13E-05
NB-95M	MDA : 4.08E-05	4.08E-05
ZR-95	MDA : 3.19E-05	3.19E-05
ZR-97	MDA : 3.55E-04	3.55E-04
NB-97	MDA : 2.60E-05	2.60E-05
MO-99	MDA : 1.50E-04	1.50E-04
TC-99M	MDA : 1.01E-05	1.01E-05
MO-101	MDA : 1.16E-04	1.16E-04
TC-101	MDA : 3.52E-05	3.52E-05
TC-102M	MDA : 1.61E-04	1.61E-04
RU-103	MDA : 1.72E-05	1.72E-05
TC-104	MDA : 3.29E-05	3.29E-05
RH-105	MDA : 6.59E-05	6.59E-05
RU-105	MDA : 4.12E-05	4.12E-05
[illegible] 106	MDA : 1.64E-04	1.64E-04
[illegible] 06	MDA : 1.64E-04	1.64E-04
AG-108M	MDA : 1.46E-05	1.46E-05
CD-109	MDA : 2.75E-04	2.75E-04

AG-110M	MDA	2.52E-05	2.52E-05
SN-113	MDA	1.82E-05	1.82E-05
SB-122	MDA	2.36E-05	2.36E-05
SB-124	MDA	1.85E-05	1.85E-05
SB-125	MDA	4.87E-05	4.87E-05
[illegible]31M	MDA	5.77E-05	5.77E-05
X[illegible]31M	MDA	4.16E-04	4.16E-04
SB-131	MDA	9.77E-05	9.77E-05
I-131	MDA	1.53E-05	1.53E-05
TE-131	MDA	1.91E-05	1.91E-05
I-132	MDA	2.11E-05	2.11E-05
TE-132	MDA	1.14E-05	1.14E-05
BA-133	MDA	2.74E-05	2.74E-05
TE-133	MDA	5.68E-05	5.68E-05
I-133	MDA	1.64E-05	1.64E-05
XE-133M	MDA	1.02E-04	1.02E-04
XE-133	MDA	2.88E-05	2.88E-05
TE-133M	MDA	2.67E-05	2.67E-05
TE-134	MDA	4.37E-05	4.37E-05
I-134	MDA	2.68E-05	2.68E-05
CS-134	MDA	2.32E-05	2.32E-05
I-135	MDA	8.77E-05	8.77E-05
XE-135M	MDA	4.51E-05	4.51E-05
XE-135	MDA	1.18E-05	1.18E-05
CS-136	MDA	2.28E-05	2.28E-05
CS-137	MDA	2.93E-05	2.93E-05
CS-138	MDA	3.13E-05	3.13E-05
XE-138	MDA	8.43E-05	8.43E-05
CS-139	MDA	1.76E-03	1.76E-03
BA-139	MDA	4.69E-05	4.69E-05
[illegible]138M	MDA	5.08E-04	5.08E-04
[illegible]39	MDA	9.99E-06	9.99E-06
BA[illegible]40	MDA	5.59E-05	5.59E-05
LA-140	MDA	2.54E-05	2.54E-05
BA-141	MDA	4.45E-05	4.45E-05
LA-141	MDA	8.64E-04	8.64E-04
CE-141	MDA	1.65E-05	1.65E-05
BA-142	MDA	1.88E-04	1.88E-04
LA-142	MDA	3.25E-05	3.25E-05
CE-143	MDA	3.01E-05	3.01E-05
PR-144	MDA	1.45E-03	1.45E-03
CE-144	MDA	7.47E-05	7.47E-05
PR-146	MDA	5.96E-05	5.96E-05
CE-146	MDA	6.44E-05	6.44E-05
ND-147	MDA	4.09E-05	4.09E-05
PR-147	MDA	1.75E-04	1.75E-04
PM-149	MDA	3.48E-04	3.48E-04
EU-152	MDA	2.44E-05	2.44E-05
HF-181	MDA	1.76E-05	1.76E-05
W-187	MDA	7.61E-05	7.61E-05
HG-203	MDA	1.37E-05	1.37E-05
NP-237	MDA	8.01E-05	8.01E-05
U-237	MDA	2.86E-05	2.86E-05
NP-239	MDA	2.95E-05	2.95E-05
AM-241	MDA	3.17E-05	3.17E-05
EU-154	MDA	1.77E-05	1.77E-05
[illegible]155	MDA	2.97E-05	2.97E-05
[illegible]4	MDA	2.09E-05	2.09E-05

```
*****************************************************************************
*                                                                           *
*             G A M M A   S P E C T R U M   A N A L Y S I S                 *
*                                                                           *
**   ************************************************************************

CA  ERRA APOGEE V2.4

Canberra Industries, Inc.                                2-DEC-97   20:59:14

                  A N A L Y S I S   P A R A M E T E R S

Spectrum file number        :  100.0      Sample no.            :    1.0
MCA unit number             :    1        ADC unit number       :  2.0
Detector number             :    2        Geometry number       :    6

Search threshold 1          :  2.0        Search threshold 2    :  3.0
Search  FROM channel        :   50        Search TO channel     : 4095
Id energy tolerance         :  0.7        Order of background   : linear
Smoothing factor            :    0        Random sum corr       : disabled
GRA parameter               :    0        Baseline channels     : disabled

Confidence threshold index :  0.100
Confidence levels       LLD :  1.645 (95.0%)        MDA :  1.645 (95.0%)

Analysis library       : SPF$LIBRARY:SPFANL.LIB;1
Background subtract    : enabled

Sample description     : CARPET #4            Analyzed by: SLC

    le size            :  1.000000E+00  EA       Conv. factor     :    1.000
    dard size          :  1.000000E+00  EA

Sample taken on        : 02-DEC-97    at  12:00:00
Collect started on     : 02-DEC-97    at  12:00:00
Decay time             :          0.0 minutes

live time              :   3000.0  seconds    real time      :   3000.0  seconds
dead time              :  0.00 %

Energy     calibration used done on    12 /  2 / 1997
Efficiency calibration used done on     8 /  7 / 1995
```

*** P E A K S E A R C H R E P O R T *** 2-DEC-97 20:59:14

first search channel	: 50
last search channel	: 4095
first significance limit for found peaks:	2.00
second significance limit for found peaks:	3.00
average Gaussian peak width (in channels):	1.40

i	peak channel	peak energy	signif of peak	check-1 signif	check-2 shape	accept channels	number
1	93.501	46.5	2.532	small			
2	100.926	50.3	2.560	small			
3	114.826	57.2	2.400	small	check		
4	127.086	63.3	4.294			127	1
5	149.738	74.7	4.637			150	2
6	154.460	77.0	6.223			154	3
7	163.270	81.4	3.276			163	4
8	167.951	83.8	3.557			168	5
9	174.541	87.1	3.463			175	6
10	185.241	92.4	5.597			185	7
11	217.789	108.7	2.028	small			
12	308.814	154.2	2.809	small	check		
13	355.208	177.4	2.021	small	check		
[illegible]	364.000	181.8	2.419	small	check		
	372.107	185.9	6.043			372	8
[illegible]	381.000	190.3	2.411	small	check		
17	477.485	238.6	2.557	small			
18	484.079	241.9	6.460			484	9
19	503.846	251.8	2.128	small	check		
20	539.196	269.5	2.232	small	check		
21	549.410	274.6	2.079	small	check		
22	590.495	295.1	8.252			590	10
23	703.865	351.8	11.677			704	11
24	1218.183	609.2	10.849			1218	12
25	1229.569	614.9	2.062	small			
26	1331.183	665.7	2.411	small	check		
27	1423.221	711.7	2.096	small	check		
28	1463.811	732.0	2.195	small	check		
29	1536.247	768.3	2.789	small	check		
30	1664.099	832.2	2.034	small	check		
31	1816.778	908.6	2.383	small	check		
32	1886.070	943.3	2.039	small			
33	2174.244	1087.4	2.023	small	check		
34	2240.420	1120.5	3.872			2240	13
35	2332.340	1166.5	2.032	small	check		
36	2346.061	1173.3	3.137			2346	14
37	2475.918	1238.3	3.529			2476	15
38	2664.255	1332.4	2.300	small	check		
39	2755.101	1377.8	2.740	small	check		
[illegible]	2921.804	1461.2	2.655	small	check		
	3458.123	1729.1	2.212	small	check		
42	3528.590	1764.3	2.477	small			

*** P E A K F I T R E P O R T *** 2-DEC-97 20:59:14

Peak		nuclide(s)		centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	error %
	1	NATURAL		127.09	63.34	1.22	89.9	15.34	1.0	26.46
B	1				63.34		6.9	15.29		
M	2	PB-214	NATURAL	149.74	74.67	1.05	128.2	12.09	1.3	16.48
M	3	PB-214		154.46	77.03	1.06	256.8	7.67	2.6	12.32
B	3				77.03		3.8	27.26		
M	4	BA-133	XE-133	163.27	81.44	1.06	21.8	48.81	0.2	49.34
M	5			167.95	83.78	1.06	54.3	21.79	0.5	22.66
M	6	NP-237	EU-155	174.54	87.07	1.06	58.7	21.19	0.6	21.79
		NATURAL								
	7	NATURAL		185.24	92.43	1.26	164.9	10.57	1.5	11.31
B	7				92.43		16.4	8.14		
	8	NATURAL	NATURAL	372.11	185.89	1.36	184.4	8.69	2.3	9.54
B	8				185.89		6.4	16.62		
	9			484.08	241.90	1.31	128.2	10.24	2.0	11.22
	10	PB-214		590.50	295.13	1.25	328.7	5.83	6.2	7.00
	11	PB-214		703.87	351.85	1.31	515.8	4.55	11.6	5.53
B	11				351.85		4.1	18.98		
	12	BI-214		1218.18	609.16	1.41	375.4	5.32	14.9	6.29
B	12				609.16		2.9	22.28		
	13	BI-214		2240.42	1120.51	1.89	55.9	14.34	4.1	14.57
	14	CO-60		2346.06	1173.34	1.88	26.9	21.90	2.0	22.07
	15	BI-214	CO-56	2475.92	1238.27	1.66	28.7	21.83	2.3	22.01

M Peak is a multiplet
B Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0002.MCA
background description: 50K BKG 11/24/97

*** R A D I O N U C L I D E R E P O R T *** 2-DEC-97 20:59:14

Sample description :CARPET #4
Analyzed by :SLC

number	nuclide	conf.value	Activity (uCi/EA) measured		decay corrected	
1. Fission gases						
2	XE-133	0.9567	1.57E-05	+-7.72E-06	1.57E-05	+-7.72E-06
		total	1.57E-05		total 1.57E-05	
2. Iodines						
		total	0.00E+00		total 0.00E+00	
3. Particulates						
1	CO-60	0.1974	5.52E-05	+-1.22E-05	5.52E-05	+-1.22E-05
3	EU-155 ?	0.3337	4.42E-05	+-9.64E-06	4.42E-05	+-9.64E-06
4	NP-237 ?	0.6621	1.19E-04	+-2.60E-05	1.19E-04	+-2.60E-05
		total	2.19E-04		total 2.19E-04	

? = nuclides with a common single line, cannot identify which one is present

Trace peaks were not identified

number	channel	energy	peak intensity (gps)		
1	127.1	63.34	9.4416E-01	+-2.57E-01	NATURAL
2	149.7	74.67	1.2990E+00	+-2.14E-01	PB-214 NATURAL
3	154.5	77.03	2.5213E+00	+-3.13E-01	PB-214
5	168.0	83.78	5.2151E-01	+-1.18E-01	
7	185.2	92.43	1.3891E+00	+-1.73E-01	NATURAL
8	372.1	185.89	2.1794E+00	+-2.14E-01	NATURAL NATURAL
9	484.1	241.90	1.9835E+00	+-2.23E-01	
10	590.5	295.13	6.1862E+00	+-4.33E-01	PB-214
11	703.9	351.85	1.1533E+01	+-6.41E-01	PB-214
12	1218.2	609.16	1.4833E+01	+-9.39E-01	BI-214
13	2240.4	1120.51	4.0593E+00	+-5.92E-01	BI-214
15	2475.9	1238.27	2.2902E+00	+-5.04E-01	BI-214 CO-56

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 2-DEC-97 20:59:14

Sample description :CARPET #4
Analyzed by :SLC

		MDA (uCi/EA) measured	MDA (uCi/EA) decay corrected
NA-24	MDA	3.77E-05	3.77E-05
AR-41	MDA	4.56E-05	4.56E-05
CR-51	MDA	2.32E-04	2.32E-04
MN-54	MDA	3.39E-05	3.39E-05
MN-56	MDA	3.31E-05	3.31E-05
CO-57	MDA	1.77E-05	1.77E-05
CO-58	MDA	4.13E-05	4.13E-05
FE-59	MDA	6.85E-05	6.85E-05
CU-64	MDA	9.29E-03	9.29E-03
NI-65	MDA	1.73E-04	1.73E-04
ZN-65	MDA	1.10E-04	1.10E-04
SE-75	MDA	2.86E-05	2.86E-05
BR-84	MDA	9.79E-05	9.79E-05
KR-85	MDA	8.38E-03	8.38E-03
SR-85	MDA	3.66E-05	3.66E-05
KR-85M	MDA	2.27E-05	2.27E-05
KR-87	MDA	5.69E-05	5.69E-05
[illegible]	MDA	8.39E-05	8.39E-05
[illegible]	MDA	4.02E-05	4.02E-05
RB [illegible]8	MDA	5.33E-04	5.33E-04
RB-89	MDA	1.63E-04	1.63E-04
KR-89	MDA	1.01E-03	1.01E-03
Y-91M	MDA	2.87E-05	2.87E-05
SR-91	MDA	9.64E-05	9.64E-05
Y-92	MDA	3.44E-04	3.44E-04
SR-92	MDA	7.05E-05	7.05E-05
Y-93	MDA	2.66E-04	2.66E-04
Y-94	MDA	1.68E-04	1.68E-04
Y-95	MDA	6.75E-04	6.75E-04
NB-95	MDA	5.42E-05	5.42E-05
NB-95M	MDA	8.41E-05	8.41E-05
ZR-95	MDA	6.93E-05	6.93E-05
ZR-97	MDA	5.99E-04	5.99E-04
NB-97	MDA	3.03E-05	3.03E-05
MO-99	MDA	2.79E-04	2.79E-04
TC-99M	MDA	2.09E-05	2.09E-05
MO-101	MDA	2.77E-04	2.77E-04
TC-101	MDA	7.12E-05	7.12E-05
TC-102M	MDA	2.27E-04	2.27E-04
RU-103	MDA	2.81E-05	2.81E-05
TC-104	MDA	5.67E-05	5.67E-05
RH-105	MDA	1.19E-04	1.19E-04
[illegible]	MDA	6.67E-05	6.67E-05
[illegible]	MDA	3.01E-04	3.01E-04
[illegible]	MDA	3.01E-04	3.01E-04
AG-108M	MDA	2.98E-05	2.98E-05
CD-109	MDA	6.23E-04	6.23E-04

AG-110M	MDA	3.14E-05	3.14E-05
SN-113	MDA	3.82E-05	3.82E-05
SB-122	MDA	4.42E-05	4.42E-05
SB-124	MDA	3.33E-05	3.33E-05
SR-[illegible]5	MDA	1.02E-04	1.02E-04
[illegible]1M	MDA	1.18E-04	1.18E-04
Xe-[illegible]31M	MDA	9.78E-04	9.78E-04
SB-[illegible].31	MDA	1.85E-04	1.85E-04
I-131	MDA	2.80E-05	2.80E-05
TE-131	MDA	4.78E-05	4.78E-05
I-132	MDA	3.76E-05	3.76E-05
TE-132	MDA	1.98E-05	1.98E-05
BA-133	MDA	7.60E-05	7.60E-05
TE-133	MDA	9.82E-05	9.82E-05
I-133	MDA	2.70E-05	2.70E-05
XE-133M	MDA	1.89E-04	1.89E-04
TE-133M	MDA	5.13E-05	5.13E-05
TE-134	MDA	9.30E-05	9.30E-05
I-134	MDA	3.43E-05	3.43E-05
CS-134	MDA	3.31E-05	3.31E-05
I-135	MDA	1.49E-04	1.49E-04
XE-135M	MDA	8.37E-05	8.37E-05
XE-135	MDA	2.00E-05	2.00E-05
CS-136	MDA	3.01E-05	3.01E-05
CS-137	MDA	3.75E-05	3.75E-05
CS-138	MDA	6.14E-05	6.14E-05
XE-138	MDA	1.79E-04	1.79E-04
CS-139	MDA	2.43E-03	2.43E-03
BA-139	MDA	1.15E-04	1.15E-04
CS-138M	MDA	1.21E-03	1.21E-03
[illegible]'39	MDA	2.45E-05	2.45E-05
[illegible]40	MDA	1.11E-04	1.11E-04
LA-[illegible]40	MDA	5.30E-05	5.30E-05
BA-141	MDA	1.09E-04	1.09E-04
LA-141	MDA	1.96E-03	1.96E-03
CE-141	MDA	3.93E-05	3.93E-05
BA-142	MDA	3.78E-04	3.78E-04
LA-142	MDA	6.09E-05	6.09E-05
CE-143	MDA	1.12E-04	1.12E-04
PR-144	MDA	2.59E-03	2.59E-03
CE-144	MDA	1.56E-04	1.56E-04
PR-146	MDA	1.09E-04	1.09E-04
CE-146	MDA	1.17E-04	1.17E-04
ND-147	MDA	9.61E-05	9.61E-05
PR-147	MDA	2.88E-04	2.88E-04
PM-149	MDA	6.16E-04	6.16E-04
EU-152	MDA	5.29E-05	5.29E-05
HF-181	MDA	2.75E-05	2.75E-05
W-187	MDA	1.11E-04	1.11E-04
HG-203	MDA	2.41E-05	2.41E-05
NP-237	MDA	1.85E-04	1.85E-04
U-237	MDA	5.96E-05	5.96E-05
NP-239	MDA	6.55E-05	6.55E-05
AM-241	MDA	7.01E-05	7.01E-05
EU-154	MDA	3.63E-05	3.63E-05
EU-155	MDA	6.72E-05	6.72E-05
[illegible]94	MDA	3.70E-05	3.70E-05

****

* G A M M A S P E C T R U M A N A L Y S I S *

****

C/ ERRA APOGEE V2.4

Canberra Industries, Inc. 2-DEC-97 19:58:07

A N A L Y S I S P A R A M E T E R S

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 1	ADC unit number	: 2.0
Detector number	: 2	Geometry number	: 6
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 0.7	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
GRA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : CARPET #2 Analyzed by: SLC

' ple size	: 1.000000E+00 EA	Conv. factor	: 1.000
S dard size	: 1.000000E+00 EA		

Sample taken on : 02-DEC-97 at 12:00:00
Collect started on : 02-DEC-97 at 12:00:00
Decay time : 0.0 minutes

live time	: 3000.0 seconds	real time	: 3000.0 seconds
dead time	: 0.00 %		

Energy calibration used done on 12 / 2 / 1997
Efficiency calibration used done on 8 / 7 / 1995

*** P E A K S E A R C H R E P O R T *** 2-DEC-97 19:58:07

first search channel	: 50
last search channel	: 4095
first significance limit for found peaks:	2.00
second significance limit for found peaks:	3.00
average Gaussian peak width (in channels):	1.40

i	peak channel	peak energy	signif of peak	check-1 signif	check-2 shape	accept channels	number
1	93.605	46.6	2.096	small			
2	122.804	61.2	2.481	small			
3	149.582	74.6	2.047	small			
4	154.529	77.1	3.983			155	1
5	174.635	87.1	2.892	small			
6	185.060	92.3	2.838	small			
7	362.975	181.3	2.314	small			
8	372.092	185.9	4.659			372	2
9	484.221	242.0	2.984	small			
10	502.719	251.2	2.129	small	check		
11	590.645	295.2	5.218			591	3
12	674.702	337.3	2.301	small			
13	694.315	347.1	2.024	small			
[illegible]	703.956	351.9	6.343			704	4
[illegible]	942.469	471.2	2.039	small	check		
[illegible]	1167.022	583.6	2.104	small			
17	1218.480	609.3	5.566			1218	5
18	1536.504	768.4	2.291	small			
19	2239.910	1120.3	3.084			2240	6
20	2475.990	1238.3	2.279	small	check		
21	3527.776	1763.9	2.992	small			

*** P E A K F I T R E P O R T *** 2-DEC-97 19:58:07

Peak		nuclide(s)	centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	error %
	1	PB-214	154.53	77.07	1.15	72.1	16.55	0.7	19.14
B	1			77.07		3.8	27.26		
	2	NATURAL NATURAL	372.09	185.88	1.30	75.2	13.88	0.9	14.43
B	2			185.88		6.4	16.62		
	3	PB-214	590.64	295.21	1.36	116.0	10.22	2.2	10.93
	4	PB-214	703.96	351.89	1.48	193.0	7.57	4.3	8.19
B	4			351.89		4.1	18.98		
	5	BI-214	1218.48	609.31	1.48	112.3	9.88	4.5	10.44
B	5			609.31		2.9	22.28		
	6	BI-214	2239.91	1120.25	1.66	22.6	24.21	1.6	24.35

B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0002.MCA
background description: 50K BKG 11/24/97

INF: no found peak matched with library lines

*** R A D I O N U C L I D E R E P O R T *** 2-DEC-97 19:58:07

le description :CARPET
yzed by :SLC

number	nuclide	conf.value	Activity (uCi/EA) measured	decay corrected

These peaks were not identified

number	channel	energy	peak intensity (gps)	
1	154.5	77.07	6.8028E-01 +-1.36E-01	PB-214
2	372.1	185.88	8.4183E-01 +-1.33E-01	NATURAL NATURAL
3	590.6	295.21	2.1832E+00 +-2.39E-01	PB-214
4	704.0	351.89	4.2576E+00 +-3.56E-01	PB-214
5	1218.5	609.31	4.3587E+00 +-4.66E-01	BI-214
6	2239.9	1120.25	1.6360E+00 +-3.98E-01	BI-214

Errors quoted at 1.000 sigma (68.3%)

*** M D A C A L C U L A T I O N R E P O R T *** 2-DEC-97 19:58:07

Sample description :CARPET
Analyzed by :SLC

	MDA (uCi/EA) measured	MDA (uCi/EA) decay corrected
NA-24	MDA : 3.11E-05	3.11E-05
AR-41	MDA : 3.60E-05	3.60E-05
CR-51	MDA : 1.72E-04	1.72E-04
MN-54	MDA : 3.06E-05	3.06E-05
MN-56	MDA : 3.10E-05	3.10E-05
CO-57	MDA : 1.31E-05	1.31E-05
CO-58	MDA : 3.68E-05	3.68E-05
FE-59	MDA : 5.68E-05	5.68E-05
CO-60	MDA : 5.07E-05	5.07E-05
CU-64	MDA : 6.73E-03	6.73E-03
NI-65	MDA : 1.82E-04	1.82E-04
ZN-65	MDA : 9.63E-05	9.63E-05
SE-75	MDA : 1.96E-05	1.96E-05
BR-84	MDA : 6.45E-05	6.45E-05
KR-85	MDA : 7.62E-03	7.62E-03
SR-85	MDA : 3.33E-05	3.33E-05
KR-85M	MDA : 1.65E-05	1.65E-05
[illegible]	MDA : 4.39E-05	4.39E-05
[illegible]	MDA : 5.36E-05	5.36E-05
Y-[illegible]	MDA : 3.10E-05	3.10E-05
RB-88	MDA : 4.40E-04	4.40E-04
RB-89	MDA : 1.11E-04	1.11E-04
KR-89	MDA : 7.64E-04	7.64E-04
Y-91M	MDA : 2.01E-05	2.01E-05
SR-91	MDA : 9.64E-05	9.64E-05
Y-92	MDA : 2.53E-04	2.53E-04
SR-92	MDA : 5.36E-05	5.36E-05
Y-93	MDA : 2.33E-04	2.33E-04
Y-94	MDA : 1.24E-04	1.24E-04
Y-95	MDA : 6.20E-04	6.20E-04
NB-95	MDA : 3.19E-05	3.19E-05
NB-95M	MDA : 5.97E-05	5.97E-05
ZR-95	MDA : 4.22E-05	4.22E-05
ZR-97	MDA : 5.53E-04	5.53E-04
NB-97	MDA : 2.91E-05	2.91E-05
MO-99	MDA : 2.07E-04	2.07E-04
TC-99M	MDA : 1.53E-05	1.53E-05
MO-101	MDA : 1.95E-04	1.95E-04
TC-101	MDA : 4.67E-05	4.67E-05
TC-102M	MDA : 2.23E-04	2.23E-04
RU-103	MDA : 2.81E-05	2.81E-05
TC-104	MDA : 3.99E-05	3.99E-05
RU-105	MDA : 9.00E-05	9.00E-05
[illegible]105	MDA : 4.56E-05	4.56E-05
R[illegible]06	MDA : 2.45E-04	2.45E-04
RU-106	MDA : 2.45E-04	2.45E-04
AG-108M	MDA : 2.35E-05	2.35E-05

CD-109	MDA	4.47E-04	4.47E-04
AG-110M	MDA	3.02E-05	3.02E-05
SN-113	MDA	3.00E-05	3.00E-05
SB-122	MDA	3.16E-05	3.16E-05
SP 24	MDA	2.61E-05	2.61E-05
25	MDA	6.12E-05	6.12E-05
TE 31M	MDA	9.30E-05	9.30E-05
XE-131M	MDA	6.28E-04	6.28E-04
SB-131	MDA	9.86E-05	9.86E-05
I-131	MDA	1.79E-05	1.79E-05
TE-131	MDA	3.20E-05	3.20E-05
I-132	MDA	2.94E-05	2.94E-05
TE-132	MDA	1.69E-05	1.69E-05
BA-133	MDA	5.05E-05	5.05E-05
TE-133	MDA	7.16E-05	7.16E-05
I-133	MDA	1.96E-05	1.96E-05
XE-133M	MDA	1.37E-04	1.37E-04
XE-133	MDA	4.54E-05	4.54E-05
TE-133M	MDA	4.25E-05	4.25E-05
TE-134	MDA	5.76E-05	5.76E-05
I-134	MDA	3.77E-05	3.77E-05
CS-134	MDA	3.87E-05	3.87E-05
I-135	MDA	1.15E-04	1.15E-04
XE-135M	MDA	5.23E-05	5.23E-05
XE-135	MDA	1.49E-05	1.49E-05
CS-136	MDA	3.01E-05	3.01E-05
CS-137	MDA	3.37E-05	3.37E-05
CS-138	MDA	3.92E-05	3.92E-05
XE-138	MDA	1.13E-04	1.13E-04
CS-139	MDA	1.58E-03	1.58E-03
I 139	MDA	7.84E-05	7.84E-05
L 38M	MDA	8.61E-04	8.61E-04
CE 139	MDA	1.67E-05	1.67E-05
BA-140	MDA	7.12E-05	7.12E-05
LA-140	MDA	3.11E-05	3.11E-05
BA-141	MDA	7.81E-05	7.81E-05
LA-141	MDA	1.18E-03	1.18E-03
CE-141	MDA	2.69E-05	2.69E-05
BA-142	MDA	2.74E-04	2.74E-04
LA-142	MDA	4.48E-05	4.48E-05
CE-143	MDA	7.56E-05	7.56E-05
PR-144	MDA	1.67E-03	1.67E-03
CE-144	MDA	1.04E-04	1.04E-04
PR-146	MDA	7.97E-05	7.97E-05
CE-146	MDA	9.31E-05	9.31E-05
ND-147	MDA	6.33E-05	6.33E-05
PR-147	MDA	2.22E-04	2.22E-04
PM-149	MDA	4.73E-04	4.73E-04
EU-152	MDA	4.01E-05	4.01E-05
HF-181	MDA	2.74E-05	2.74E-05
W-187	MDA	9.79E-05	9.79E-05
HG-203	MDA	1.92E-05	1.92E-05
NP-237	MDA	1.26E-04	1.26E-04
U-237	MDA	4.39E-05	4.39E-05
NP-239	MDA	4.60E-05	4.60E-05
AM-241	MDA	4.22E-05	4.22E-05
154	MDA	2.89E-05	2.89E-05
E 55	MDA	4.67E-05	4.67E-05
Nb-94	MDA	2.34E-05	2.34E-05

HSA ID# 98

Maine Yankee
RELIABLE ELECTRICITY SINCE 1972

MAINE YANKEE GENERAL SURVEY RECORD FORM

N

Map#: OSA-007 Revision#: 00	Date: 11-18-97	Time: 1330	Reactor Pwr %: SD	Tech File Number: 19.20.11.8	RWP's Used: 97-00001	Dose Received: Ø mR

Surveyor Name: (Printed) J Johndro K Ambrose

Surveyor Name: (Signature) E Johndro

Location/Job Description: Survey area to release from PWST AREA RRA

Required R.P. Review / Date: Scott Clubley 11/18/97

[2] Required ALARA Supervisor Review / Date: N/A

REASON FOR SURVEY
- ☐ ROUTINE[1]
- ☐ JOB-COVERAGE[1] Survey
- ☐ SHIELDING[1,2]
- ☑ OTHER[1] (Specify): ~~from RRA~~ to release

INSTRUMENTS USED

MODEL	SERIAL #	CAL DUE	MDA
3	72622-91	2-19-98	dpm 1000
3	72384-91	2-19-98	dpm 1000
		A	
		N	

CONTAMINATION RESULTS

SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS
				A			
				N			

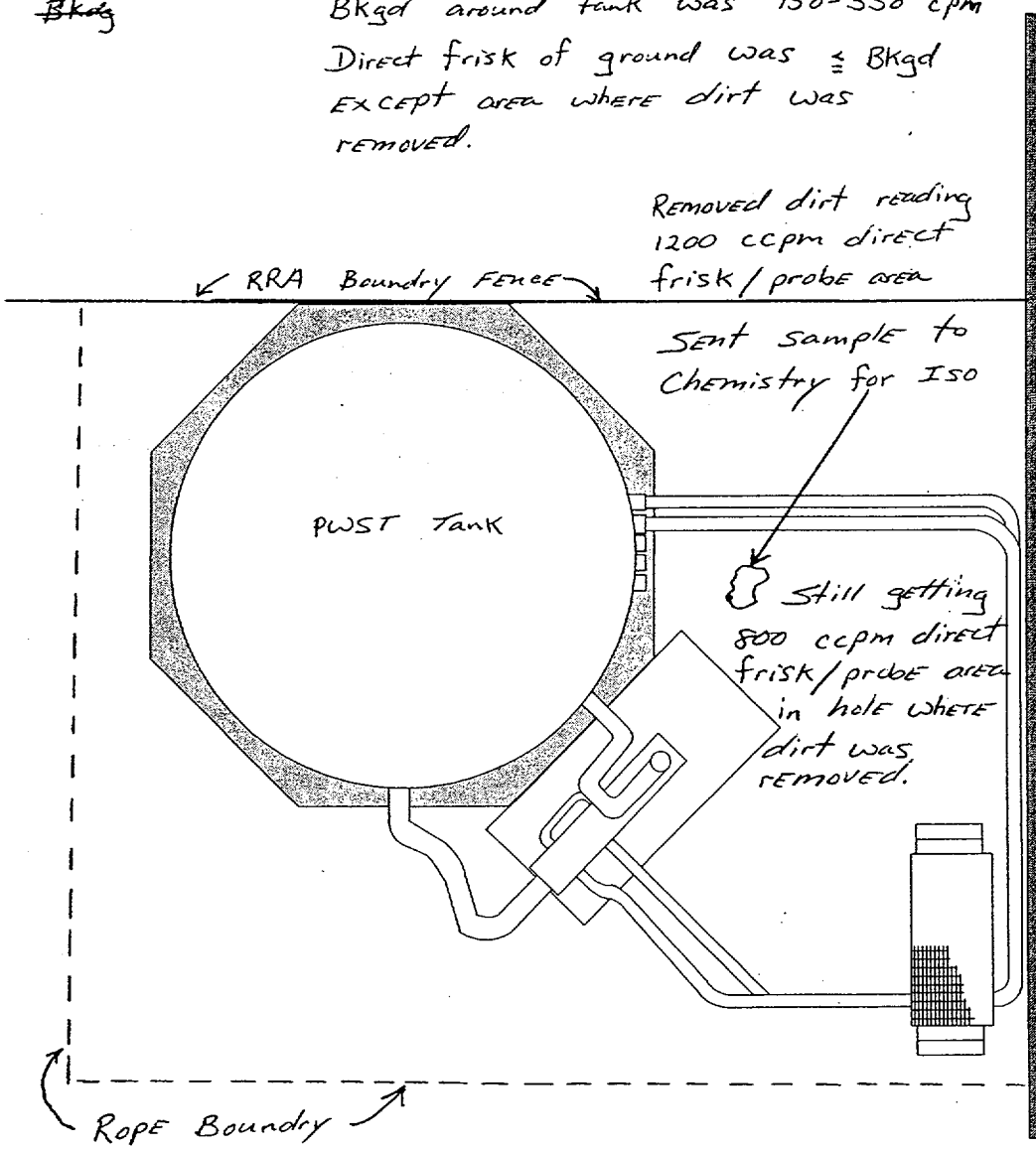
KEY:
- Contact exposure rates denoted by: *
- Smear locations denoted by: ⊘
- Boundaries or barriers denoted by: -x-x-
- Dose rates denoted by: #
- Large area smears denoted by: #
- Air sample location denoted by: AS-#

Sample Continuation Sheet Used. ☐ YES

~~Bkdg~~ A 11-18-97

Bkgd around tank was 150-350 cpm
Direct frisk of ground was ≤ Bkgd
except area where dirt was
removed.

Removed dirt reading
1200 ccpm direct
frisk / probe area



GAMMA SPECTRUM ANALYSIS

CANBERRA APOGEE V2.4

Canberra Industries, Inc. 18-NOV-97 15:51:27

ANALYSIS PARAMETERS

Spectrum file number	: 100.0	Sample no.	: 1.0
MCA unit number	: 1	ADC unit number	: 2.0
Detector number	: 2	Geometry number	: 5
Search threshold 1	: 2.0	Search threshold 2	: 3.0
Search FROM channel	: 50	Search TO channel	: 4095
Id energy tolerance	: 0.7	Order of background	: linear
Smoothing factor	: 0	Random sum corr	: disabled
SRA parameter	: 0	Baseline channels	: disabled

Confidence threshold index : 0.100
Confidence levels LLD : 1.645 (95.0%) MDA : 1.645 (95.0%)

Analysis library : SPF$LIBRARY:SPFANL.LIB;1
Background subtract : enabled

Sample description : PWST DIRT Analyzed by: WS

Sample size : 1.765200E+03 GRAM Conv. factor : 1.000
Standard size : 1.000000E+00 EA

Sample taken on : 18-NOV-97 at 12:00:00
Collect started on : 18-NOV-97 at 14:59:11
Decay time : 179.2 minutes

live time : 3000.0 seconds real time : 3041.0 seconds
dead time : 1.35 %

Energy calibration used done on 11 / 18 / 1997
Efficiency calibration used done on 11 / 8 / 1996

*** P E A K F I T R E P O R T *** 18-NOV-97 15:51:27

	Peak no.	nuclide(s)	centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	error %
M	1	PB-214 NATURAL	150.29	74.88	1.05	1166.2	9.47	23.2	14.46
M	2	PB-214	154.87	77.17	1.06	892.7	12.47	17.2	15.68
	3	NATURAL	477.44	238.55	1.18	835.1	13.14	16.0	13.78
B	3			238.55		8.2	19.62		
	4	PB-214	590.66	295.19	1.21	542.6	17.02	12.3	17.39
	5	NATURAL	677.47	338.63	1.14	363.8	27.69	9.3	27.87
	6	PB-214	704.32	352.06	1.06	509.8	17.74	13.5	18.00
	7	NATURAL	1166.13	583.13	1.51	357.0	13.85	14.9	14.29
B	7			583.13		3.6	25.69		
M	8	CS-134	1209.41	604.78	1.40	145.3	29.94	6.3	30.14
M	9	BI-214	1219.01	609.58	1.41	426.5	11.37	18.6	11.89
?	10	CS-137	1323.09	661.66	1.48	355574.5	0.17	16725.9	3.31
	11	I-135	1415.12	707.71	1.34	33.2	42.38	1.7	42.50
	12	CS-134	1591.16	795.78	1.72	169.3	10.60	9.4	10.95
	13	NATURAL	1821.91	911.22	1.70	201.5	9.09	12.7	9.42
	14		1866.72	933.64	1.35	28.3	41.72	1.8	41.79
	15	NATURAL RU-105	1937.51	969.05	1.91	86.6	16.02	5.8	16.21
	16	BI-214	2239.99	1120.34	1.66	73.7	16.65	5.6	16.86
	17	CO-60	2345.66	1173.19	1.74	1074.0	3.19	84.8	4.25
	18	CO-60	2664.24	1332.48	1.72	1014.1	3.21	89.4	4.40
	19	NATURAL	2920.88	1460.77	1.90	1229.6	2.89	117.1	4.14
	19			1460.77		4.6	19.43		
	20	BI-214	3528.64	1764.40	2.08	50.7	15.27	5.6	15.66

M - Peak is a multiplet
? - Poor goodness-of-fit value.
B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0002.MC1
background description: 25K LUB OIL BLK 11/1

*** R A D I O N U C L I D E R E P O R T *** 18-NOV-97 15:51:27

Sample description :PWST DIRT
Analyzed by :WS

number	nuclide	conf.value	Activity (uCi/GRAM) measured		Activity (uCi/GRAM) decay corrected	
1. Fission gases						
	total		0.00E+00		total	0.00E+00
2. Iodines						
	total		0.00E+00		total	0.00E+00
3. Particulates						
1	CO-60	0.9994	1.33E-06	+-4.07E-08	1.33E-06	+-4.07E-08
2	CS-134	0.4901	1.69E-07	+-1.85E-08	1.69E-07	+-1.85E-08
3	CS-137	1.0000	3.01E-04	+-9.96E-06	3.01E-04	+-9.96E-06
	total		3.02E-04		total	3.02E-04

These peaks were not identified

nr	channel	energy	peak intensity (gps)			
1	150.3	74.88	2.3247E+01	+-3.36E+00	PB-214	NATURAL
2	154.9	77.17	1.7170E+01	+-2.69E+00	PB-214	
3	477.4	238.55	1.5879E+01	+-2.21E+00	NATURAL	
4	590.7	295.19	1.2349E+01	+-2.15E+00	PB-214	
5	677.5	338.63	9.3026E+00	+-2.59E+00	NATURAL	
6	704.3	352.06	1.3487E+01	+-2.43E+00	PB-214	
7	1166.1	583.13	1.4786E+01	+-2.13E+00	NATURAL	
8	1209.4	604.78	6.2880E+00	+-1.90E+00	CS-134	
9	1219.0	609.58	1.8594E+01	+-2.21E+00	BI-214	
11	1415.1	707.71	1.6628E+00	+-7.07E-01	I-135	
13	1821.9	911.22	1.2712E+01	+-1.20E+00	NATURAL	
14	1866.7	933.64	1.8274E+00	+-7.64E-01		
15	1937.5	969.05	5.7778E+00	+-9.37E-01	NATURAL	RU-105
16	2240.0	1120.34	5.5900E+00	+-9.43E-01	BI-214	
19	2920.9	1460.77	1.1667E+02	+-4.85E+00	NATURAL	
20	3528.6	1764.40	5.6354E+00	+-8.83E-01	BI-214	

Errors quoted at 1.000 sigma (68.3%)

* M D A C A L C U L A T I O N R E P O R T *** 18-NOV-97 15:51:27

Sample description :PWST DIRT
Analyzed by :WS

	MDA (uCi/GRAM) measured		decay corrected
NA-24	MDA	5.63E-08	6.46E-08
AR-41	MDA	7.56E-08	2.35E-07
CR-51	MDA	2.69E-06	2.70E-06
MN-54	MDA	8.31E-08	8.32E-08
MN-56	MDA	8.19E-08	1.83E-07
CO-57	MDA	2.36E-07	2.36E-07
CO-58	MDA	7.86E-08	7.87E-08
FE-59	MDA	1.63E-07	1.63E-07
CU-64	MDA	9.89E-06	1.16E-05
NI-65	MDA	1.69E-07	3.84E-07
ZN-65	MDA	1.90E-07	1.90E-07
SE-75	MDA	3.34E-07	3.34E-07
BR-84	MDA	1.93E-07	9.57E-06
KR-85	MDA	7.11E-05	7.11E-05
SR-85	MDA	3.11E-07	3.11E-07
[illegible] 95M	MDA	2.59E-07	4.11E-07
[illegible] 7	MDA	6.57E-07	3.35E-06
KR[illegible]3	MDA	3.80E-07	7.87E-07
Y-88	MDA	4.06E-08	4.07E-08
RB-88	MDA	4.32E-07	4.64E-04
RB-89	MDA	3.76E-07	1.17E-03
KR-89	MDA	6.77E-06	7.94E+11
Y-91M	MDA	2.57E-07	3.13E-06
SR-91	MDA	2.52E-07	3.13E-07
Y-92	MDA	6.03E-07	1.08E-06
SR-92	MDA	6.32E-08	1.36E-07
Y-93	MDA	3.12E-06	3.83E-06
Y-94	MDA	3.17E-07	2.43E-04
Y-95	MDA	1.69E-06	2.92E-01
NB-95	MDA	8.69E-08	8.71E-08
NB-95M	MDA	9.37E-07	9.59E-07
ZR-95	MDA	1.50E-07	1.50E-07
ZR-97	MDA	2.36E-06	2.66E-06
NB-97	MDA	1.62E-06	9.06E-06
MO-99	MDA	6.53E-07	6.73E-07
TC-99M	MDA	2.49E-07	2.56E-07
MO-101	MDA	1.74E-06	8.58E-03
TC-101	MDA	7.97E-07	5.01E-03
TC-102M	MDA	2.27E-06	5.71E+06
RU-103	MDA	3.70E-07	3.71E-07
TC-104	MDA	7.27E-07	6.95E-04
[illegible] 105	MDA	1.38E-06	1.46E-06
R[illegible]05	MDA	1.71E-07	2.72E-07
RH[illegible]06	MDA	2.37E-06	2.37E-06
RU-106	MDA	2.37E-06	2.37E-06
AG-108M	MDA	8.93E-08	8.93E-08
CD-109	MDA	6.35E-06	6.35E-06

AG-110M	MDA	1.10E-07	1.11E-07
SN-113	MDA	4.89E-07	4.90E-07
SB-122	MDA	3.42E-07	3.53E-07
S[illegible]24	MDA	8.56E-08	8.57E-08
[illegible]25	MDA	1.21E-06	1.21E-06
TE[illegible]31M	MDA	2.22E-07	2.37E-07
XE-131M	MDA	1.01E-05	1.01E-05
SB-131	MDA	3.87E-07	8.52E-05
I-131	MDA	3.57E-07	3.61E-07
TE-131	MDA	5.26E-07	7.56E-05
I-132	MDA	1.14E-07	2.82E-07
TE-132	MDA	2.68E-07	2.75E-07
BA-133	MDA	4.79E-07	4.80E-07
TE-133	MDA	1.11E-06	2.38E-02
I-133	MDA	3.33E-07	3.67E-07
XE-133M	MDA	2.27E-06	2.36E-06
XE-133	MDA	6.53E-07	6.64E-07
TE-133M	MDA	1.21E-07	1.13E-06
TE-134	MDA	2.88E-07	5.62E-06
I-134	MDA	8.60E-08	9.12E-07
I-135	MDA	2.49E-07	3.41E-07
XE-135M	MDA	9.11E-07	2.96E-03
XE-135	MDA	2.58E-07	3.24E-07
CS-136	MDA	7.95E-08	8.00E-08
CS-138	MDA	5.84E-08	2.76E-06
XE-138	MDA	1.14E-06	7.52E-03
CS-139	MDA	4.06E-06	2.22E+00
BA-139	MDA	1.16E-06	5.19E-06
CS-138M	MDA	2.16E-06	8.60E+12
[illegible]39	MDA	2.48E-07	2.48E-07
B[illegible]40	MDA	1.10E-06	1.10E-06
LA-140	MDA	5.57E-08	5.61E-08
BA-141	MDA	1.10E-06	9.84E-04
LA-141	MDA	2.04E-06	3.45E-06
CE-141	MDA	4.05E-07	4.06E-07
BA-142	MDA	2.07E-06	2.27E-01
LA-142	MDA	4.41E-07	1.62E-06
CE-143	MDA	6.10E-07	6.50E-07
PR-144	MDA	6.53E-06	6.54E-06
CE-144	MDA	1.84E-06	1.84E-06
PR-146	MDA	4.50E-07	7.96E-05
CE-146	MDA	1.37E-06	1.04E-02
ND-147	MDA	7.90E-07	7.96E-07
PR-147	MDA	3.33E-06	3.08E-02
PM-149	MDA	8.26E-06	8.59E-06
EU-152	MDA	2.83E-07	2.83E-07
HF-181	MDA	4.14E-07	4.14E-07
W-187	MDA	3.44E-07	3.76E-07
HG-203	MDA	2.86E-07	2.86E-07
NP-237	MDA	1.83E-06	1.83E-06
U-237	MDA	7.92E-07	8.02E-07
NP-239	MDA	8.87E-07	9.20E-07
AM-241	MDA	9.44E-07	9.44E-07
EU-154	MDA	2.02E-07	2.02E-07
F[illegible]155	MDA	6.80E-07	6.80E-07
I[illegible]4	MDA	8.16E-08	8.16E-08

HSA ID# 99

Maine Yankee
RELIABLE ELECTRICITY SINCE 1972

MAINE YANKEE GENERAL SURVEY RECORD FORM

Map#: MSC-001 Revision#: 00	Date: 12-2-97	Time: 1030	Reactor Pwr %: S/D	Tech File Number:	RWP's Used: 97-00096	Dose Received: ∅ mR
Surveyor Name: (Printed): Timothy Huff	Surveyor Name: (Signature): Timothy Huff	Location/Job Description: PAB 36'				
[1] Required R.P. Review / Date: 12/2/97	[2] Required ALARA Supervisor Review / Date: N/A	☐ ROUTINE[1] ☐ SHIELDING[1,2]	REASON FOR SURVEY: ☒ JOB-COVERAGE[1] ☐ OTHER[1] (Specify):			

INSTRUMENTS USED

MODEL	SERIAL #	CAL DUE	MDA
M-3	132261	12-14-97	N/A
M-5	72504	4-22-98	1000
	N	A	

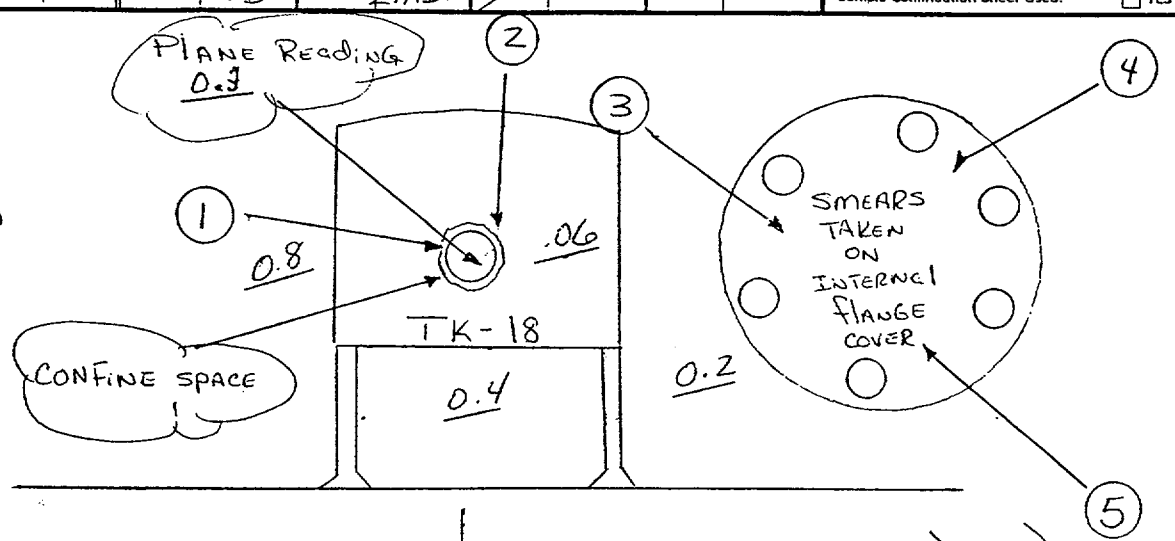
CONTAMINATION RESULTS

SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS
1	<MDA	6	<MDA	11	30K		
2	<MDA	7	<MDA				
3	<MDA	8	<MDA		N		
4	<MDA	9	<MDA			A	
5	<MDA	10	<MDA				

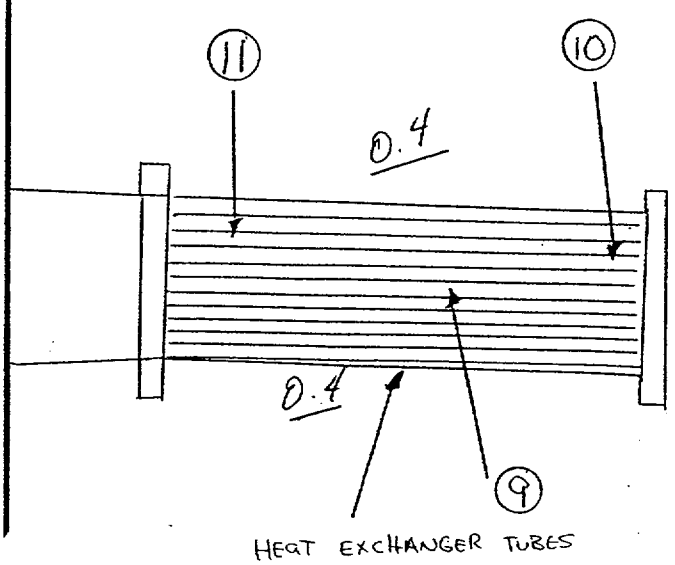
KEY:
- Contact exposure rates denoted by: *
- Smear locations denoted by: ⊘
- Boundaries or barriers denoted by: -x-x-
- Dose rates denoted by: •
- Large area smears denoted by: ▭
- Air sample location denoted by: AS-#

Sample Continuation Sheet Used. ☐ YES

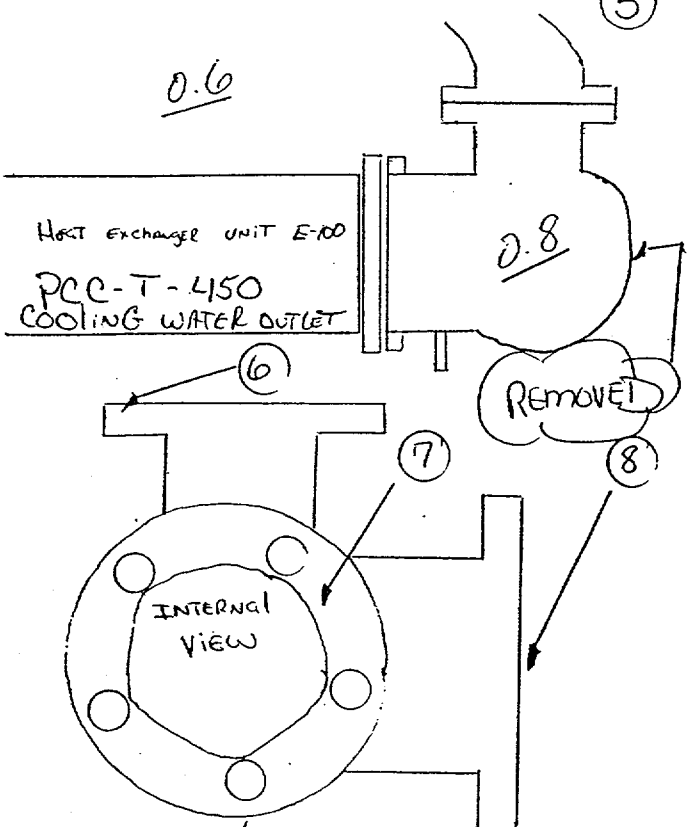
PAB 36'
POSTED
RADIATION
AREA
RADIOACTIVE
MATERIAL



SMEAR (11) TAKEN ON SLUDGE



TUBES STAYED IN PLACE BUT BAGGED AND TAGGED. NOT REMOVED.



HSA ID# 100

...-Dec-1997 2300-0700 cont.

⑥ Service Bldg air Sample was changed out.

0445 ⑦ High Rad Key Inventory completed Sat.
HRA Key #'s 53, 59, 60, 61, 74, 75, 76 + MMC 14+20 w/RP.
HRA Key #'s 1+62 w/ops.

~~0445~~ ⑧ Relieved by R Appleton

Date 12/10/97 Shift 0700-1500 Tech R Bull
Rx Power 0 % Oper. Chg. Pump N/A
Waste Processing Status:
EV-1 ↓ EV-2 ↓ Duratek
RMS Monitors Out of Service:

① Reviewed Log, received turnover, Relieved watch

② 97-96 Site Characterization Aux Feed, HPSI Valve Room

③ 97-26 Fire Inspection

④ Attended OPS turnover NO R.P. ISSUES

⑤ 97-58 Resin Sluice Tk-109 to HIC

⑥ 97-92 S.F. Prep Work for Lowering H2O Level in Coffer Dam

⑦ 97-6 HV-7/9 winter prep work

⑧ HiRAD Key inventory sat Key # 53, 59, 60, 61, 74, 75, 76 + MMC 14+20 w/RP, Key #1, 62 w/OPS

⑨ GTS/Duratek Found 1.2 K ppm/100cm² INSIDE N-P-43. Postal valve Contaminated on inside

⑩ Relieved By John Barker

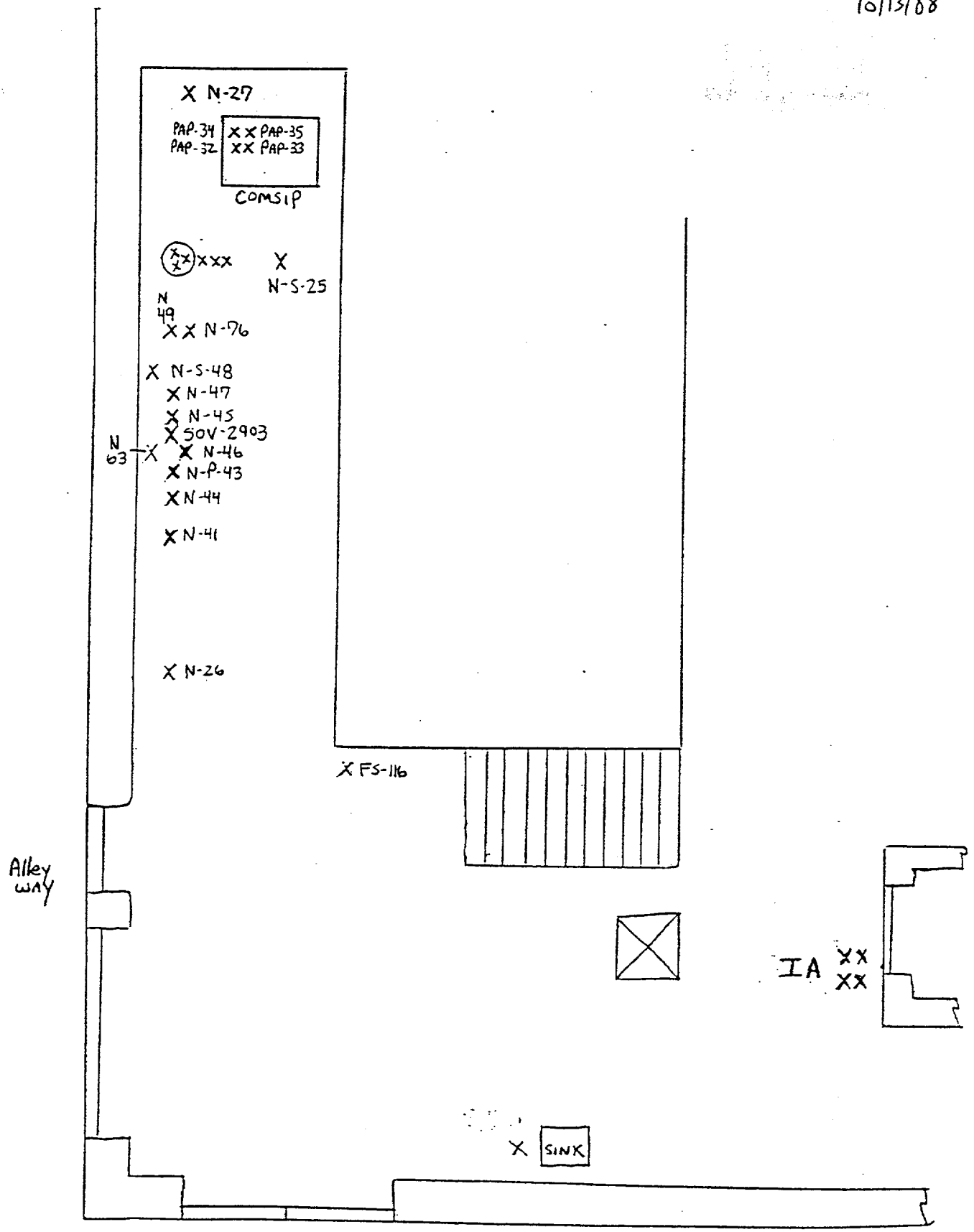
Date 12-10-97 Shift 1500-2300 Tech Barker
Rx Power 0 % Oper. Chg. Pump N/A
Waste Processing Status:
EV-1 ↓ EV-2 ↓ Duratek ↓
RMS Monitors Out of Service:

① Received turnover, reviewed log & RCSIB

② No Ops T/O Items

Complete

10/13/88



PAB 21'

21

HSA ID# 101

MAINE YANKEE RADIATION PROTECTION

Shift Log Book

Date 12/12/97 Shift 2300 - 0700 Tech SJU

Rx Power N/A % Oper. Chg. Pump N/A

Waste Processing Status:

EV-1 ↓ EV-2 ↓ Duratek ↓

RMS Monitors Out of Service:

① Revieued the logs, RCSIB, Night Orders, received formal turnover, relieved the watch.

② Daily instrument source checks are complete. All meters accounted for. All checked are SAT.

③ Contacted Ops for turnover items. No items of Rad Con concern.

④ Daily CAM A/S filters changed out.

⑤ Service bld. daily A/S changed out / counted.

⑥ High Rad key inventory as follows. PSS has key #1, A/O key 62, keys 76, 75, 74, 61, 60, 59, 53, MCC-14 & 20 in key locker.

⑦ Relieved by P. Stover.

Date 12/12/97 Shift 0700 - 1500 Tech P Stover

Rx Power Ø % Oper. Chg. Pump NA

Waste Processing Status:

EV-1 ↓ EV-2 ↓ Duratek ↓

RMS Monitors Out of Service: —

SOW

① Reviewed logs, Relieved watch

② Duratec Called found contamination near wharehouse #1 found it, removed it, Beli-ing as this is written - beli CO-60 Bawn Notified @ 1000 hrs. Particle Stored in Source Room.

3. High Rad Key Inventory completed SAT.
RC Key # 53, 59, 60, 61, 74, 75, 76 MCC 14 & 20
Ops Key # 62 & 1

4. Routine Surveys per posted Schedule.

Maine Yankee
RELIABLE ELECTRICITY SINCE 1972

MAINE YANKEE GENERAL SURVEY RECORD FORM

Map#: MSC-001 Revision#: 00	Date:	Time:	Reactor Pwr %	Tech File Number:	RWP's Used:	Dose Received:
	12/12/97	1000	0		97-1	0 mR

Surveyor Name: (Printed)	Surveyor Name: (Signature)	Location/Job Description:
Carville		Warehouse lot in front of sea -Land

[1] Required R.P. Review / Date	[2] Required ALARA Supervisor Review / Date	REASON FOR SURVEY
12/12/97	N/A	☐ ROUTINE[1] ☐ JOB-COVERAGE[1] ☐ SHIELDING[1,2] ☒ OTHER[1] (Specify): Dura-tec

INSTRUMENTS USED

MODEL	SERIAL #	CAL DUE	MDA
M-3	66477-90	3-23-98	—

CONTAMINATION RESULTS

SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS

KEY:

- Contact exposure rates denoted by: *
- Smear locations denoted by: ◉
- Boundaries or barriers denoted by: -x-x-
- Dose rates denoted by: #
- Large area smears denoted by: ☐ #
- Air sample location denoted by: AS-#

Sample Continuation Sheet Used. ☐ YES

Dur-tec notified Rad-Controls that a 30K dpm spot was located in a crack in the asphalt near the warehouse outside of the protected area. I responded and verified the spot there removed and bagged the particals.

I direct fristed an area 3 feet in diameter and found no futher contamination. Dura-tec is expanding their survey in this area also.

Gel Results show the partical is CO-60.

*** N E W 1 0 C F R 2 0 R E P O R T *** 12-DEC-97 10:35:20

I n h a l a t i o n D A C V a l u e s

lide	activity uCi/EA	Inhalation DAC uCi/ML	fraction of Inhalation DAC
I-60	1.2518E-01	1.0000E-08	1.2518E+07
		total	1.2518E+07

HSA ID# 102

Maine Yankee
RELIABLE ELECTRICITY SINCE 1972

MAINE YANKEE GENERAL SURVEY RECORD FORM

Map#: MSC-001	Date:	Time:	Reactor Pwr %	Tech File Number:	RWP's Used:	Dose Received:
Rev#: 00	1/20/98	1000	0		98-1	0 mR

Surveyor Name: (Printed)	Surveyor Name: (Signature)	Location/Job Description:
S. Carvill	J. Carvill	Turbine Bld. 21' elv. S.F.C Characterization

[1] Required R.P. Review / Date	[2] Required ALARA Supervisor Review / Date	REASON FOR SURVEY
1/20/98		☐ ROUTINE[1] ☒ JOB-COVERAGE[1] ☐ SHIELDING[1,2] ☐ OTHER[1] (Specify):

INSTRUMENTS USED

MODEL	SERIAL #	CAL DUE	MDA
ud-3	72348	4/29/98	BKG 400cpm

CONTAMINATION RESULTS

SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS

KEY:
- Contact exposure rates denoted by: *
- Smear locations denoted by: ◉
- Boundaries or barriers denoted by: -x-x-
- Dose rates denoted by: #
- Large area smears denoted by: □ #
- Air sample location denoted by: AS-#

Sample Continuation Sheet Used. ☐ YES

SW-157 spoolpiece - 1K dpm/100 cm²

SW-42 spoolpiece - 5-50K dpm/100cm²

} Rc closed Valves shut job down until RWP is written and area setup. Per Bob Gann

Area deconned to <100cpm LAS and <1,000 dpm/100cm²

P-10A spoolpiece - <MDA

HSA ID# 103

MAINE YANKEE | RELIABLE ELECTRICITY SINCE 1972

MAINE YANKEE GENERAL SURVEY RECORD FORM

Map#: MSC-001 Revision#: 00	Date: 1/21/97	Time: 1400	Reactor Pwr %: 0	Tech File Number:	RWP's Used: 1	Dose Received: 0 mR
Surveyor Name: (Printed) S. Carville	Surveyor Name: (Signature)	Location/Job Description: Turbine Bld. Site Characterization				

[3] Required R.P. Review / Date: 1/21/97

[2] Required ALARA Supervisor Review / Date:

REASON FOR SURVEY: ☐ ROUTINE[1] ☒ JOB-COVERAGE[1] ☐ SHIELDING[1,2] ☐ OTHER[1] (Specify):

INSTRUMENTS USED

MODEL	SERIAL #	CAL DUE	MDA
4-3	72453	3/23/98	13K/60

CONTAMINATION RESULTS

SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS

KEY:
- Contact exposure rates denoted by: *
- Smear locations denoted by: ⊙
- Boundaries or barriers denoted by: -x-x-
- Dose rates denoted by: •
- Large area smears denoted by: [ ]
- Air sample location denoted by: ASC

Sample Continuation Sheet Used. ☐ YES

P-10-A spool piece — < MDA loose surface
SCC pumps — 100-200 cpm/probe area fixed

E-7 Head — < MDA loose surface
Lube oil cooler — < 100 cpm/probe area fixed

Diesel Generator — SCC spool piece — < MDA loose surface
< 100 cpm/probe area fixed

HSA ID# 104

MAINE YANKEE ISSUE REPORT **Report Date/Time:** 01/21/1998 07:56

No. 97-03189 **Rev No.** 0

IDENTIFICATION/REPORTING

Risk Level: 4	**Issue Owner:** HICKEY, DENNIS, L.
Issue Status: Open	**Issue Target Date:**
Discovery Date/Time: 9/18/97 06:35:00	**Discoverer:** DALTON, JOHN, O.
How Discovered: Management/Supervision	**Source:**
Issue Category: Environmental Health & Safety	**Issue Type:** Hazardous Material Spill

Title: Oil spill in south yard

A T&R trash truck was lifting a dumpster when a hydraulic hose developed a leak. Less than one gallon of oil spilled to the ground (pavement and soil). Security personnel promptly notified the control room and the spill plan was implemented.

Apparent Cause(s):

Hose failed due to some type of defect.

Immediate Corrective Actions Taken:

Placed absorbent material to absorb standing oil.
Notified all required parties.
Documented spill on ATT. C.

Response Teams Mobilized:

Oil Spill Response Team

Additional Notification(s) Made:

EHS/EP

LER

LER Required? (Yes/No/Potential) No

FITNESS FOR DUTY

Fitness for Duty Evaluated? No **For Cause Testing Required?**

Issue Coding

Basis for Risk Priority

Recurrence - High, several instances with hydraulic oil spills in the protected area. Significance - Low, based on amount spilled below reportable levels. Evauluation - Level D, Barrier Screen results only.

Originating Department: Environmental Programs Section

SALP Code (Major) Other

SALP Code (Minor) Environmental Health & Safety

Cause Code (Major) Plant/System Operation

Cause Code (Minor) Component aging.

HSA ID# 105

Unaffe ystem Readings > ~~4250~~ 2000 dpm/100 cm2 as of 1/19/98

	File	L1 Code	L2 Code	L7 Code	Bkg Count Time (min)	BKG CPM	Bkg dpm/ 100 cm2	Sample Count Time (min)	Sample CPM	Sample dpm/ 100 cm2	Detector Efficiency	Detector Area (cm2)	MDA (dpm/ 100 cm2)	Net dpm/ 100 cm2
CD-93 4" line	125	D0100	02P01	00003	5.00	93	2985	5.00	160	5123	0.067	46.5	661	2138
North of Condenser														
	240	D0200	01T03	00001	0.50	1336	5198	0.50	5450	21203	0.204	126	957	16005
ALUM STORAGE	240	D0200	01T03	00002	0.50	1166	4536	0.50	6922	26930	0.204	126	895	22393
TANK TK-37	240	D0200	01T03	00003	0.50	1120	4357	0.50	7812	30392	0.204	126	878	26035
	240	D0200	01T04	00001	0.25	268	1043	0.25	1212	4715	0.204	126	635	3673
ALUM ADDITION	240	D0200	01T04	00002	0.25	336	1307	0.25	1612	6271	0.204	126	706	4964
TANK TK-48	240	D0200	01T04	00003	0.25	304	1183	0.25	860	3346	0.204	126	673	2163
	250	D0300	01P04	00002	10.00	379	14037	10.00	456	16896	0.027	100	1071	2859
Domestic Water	250	D0300	01P05	00001	10.00	325	12026	10.00	382	14156	0.027	100	992	2130
res at DW-717Y														
And RCA	388	D0400	05P08	00001	3.00	354	7874	3.00	623	13844	0.045	100	1144	5970
ac at DW-173RCA	388	D0400	05P08	00002	3.00	357	7933	3.00	462	10267	0.045	100	1148	2333
RCA	331	D0900	03P01	00001	6.00	137	4292	6.00	340	10625	0.032	100	710	6333
	331	D0900	03P01	00002	6.00	118	3688	6.00	327	10224	0.032	100	659	6536
	331	D0900	03P01	00003	6.00	111	3469	6.00	339	10599	0.032	100	639	7130
	331	D0900	03P02	00001	6.00	133	4146	6.00	199	6208	0.032	100	698	2063
	331	D0900	03P02	00002	6.00	113	3536	6.00	201	6271	0.032	100	646	2734
	331	D0900	03P02	00003	6.00	102	3172	6.00	201	6266	0.032	100	612	3094
	340	D0900	03P03	00001	10.00	1411	30678	10.00	2542	55270	0.046	100	1207	24591
	340	D0900	03P03	00002	10.00	1497	32546	10.00	2792	60691	0.046	100	1243	28146
RCA	340	D0900	03P03	00003	10.00	1567	34070	10.00	2864	62261	0.046	100	1272	28191
	339	D0900	03S01	00003	10.00	347	19834	10.00	419	23917	0.113	15.5	1581	4082
	339	D0900	03S02	00003	10.00	341	19480	10.00	409	23374	0.113	15.5	1567	3894
	336	D0900	03T01	00001	10.00	639	36163	10.00	766	43339	0.114	15.5	2120	7176
	336	D0900	03T01	00002	10.00	786	44465	10.00	846	47900	0.114	15.5	2349	3435
	336	D0900	03T01	00003	10.00	698	39513	10.00	771	43616	0.114	15.5	2216	4103
	339	D0900	03T02	00003	10.00	211	12070	10.00	262	14964	0.113	15.5	1237	2895
RCA	207	D0900	05P01	00001	9.00	599	11528	9.00	5634	116414	0.048	100	797	104887
Lux Boiler														
Condensate Receiver	100	D1000	02T02	00001	0.25	244	913	0.25	1004	3759	0.212	126	585	2845
TK-30	100	D1000	02T02	00002	0.25	220	824	0.25	972	3639	0.212	126	557	2815
RCA	160	D1100	02P01	00003	5.00	1024	20472	5.00	1157	23148	0.05	100	1342	2676
RCA	81	D1200	04P03	00001	0.25	448	1631	0.25	1700	6189	0.218	126	757	4558
RCA	65	D1300	01V01	00002	2.00	66	3842	2.00	120	7038	0.11	15.5	1641	3196
RCA	65	D1300	03V01	00004	2.00	24	1378	2.00	76	4457	0.11	15.5	1015	3079
RCA	97	D1300	06V02	00001	30.00	437	24946	30.00	634	36198	0.113	15.5	1019	11251
RCA	86	D1300	07P01	00001	25.00	2061	51527	25.00	2173	54330	0.04	100	1059	2803

Unaffec ystem Readings > ~~1250~~ 2000 dpm/100 cm2 as of 1/19/98

	File	L1 Code	L2 Code	L7 Code	Bkg Count Time (min)	BKG CPM	Bkg dpm/ 100 cm2	Sample Count Time (min)	Sample CPM	Sample dpm/ 100 cm2	Detector Efficiency	Detector Area (cm2)	MDA (dpm/ 100 cm2)	Net dpm/ 100 cm2
RCA	85	D1300	08T01	00002	2.00	4806	21188	2.00	5709	25170	0.18	126	1012	3981
RCA	85	D1300	08T01	00008	2.00	4919	21687	2.00	5646	24892	0.18	126	1023	3205
RCA	221	D3100	01A02	00001	1.50	4850	18869	1.50	26921	104736	0.204	126	1036	85867
	221	D3100	01A02	00002	1.50	5100	19841	1.50	26982	104972	0.204	126	1063	85131
	221	D3100	01A02	00003	1.50	4957	19284	1.50	27062	105283	0.204	126	1048	86000
	221	D3100	01A02	00004	1.50	4972	19343	1.50	26897	104640	0.204	126	1049	85297
	209	D3100	01A06	00002	0.25	652	2767	0.25	1456	6179	0.187	126	1054	3412
	209	D3100	01A06	00003	0.25	608	2580	0.25	1664	7062	0.187	126	1020	4482
RCA	209	D3100	01A06	00004	0.25	648	2750	0.25	1496	6349	0.187	126	1051	3599
FN-5A (posted)	221	D3100	02A03	00004	0.25	404	1572	0.25	2440	9493	0.204	126	770	7921 posted
	221	D3100	02A04	00001	0.25	528	2054	0.25	1152	4482	0.204	126	874	2428
	221	D3100	02A04	00002	0.25	412	1603	0.25	2388	9290	0.204	126	777	7688
	221	D3100	02A04	00003	0.25	540	2101	0.25	1212	4715	0.204	126	883	2614
FN-6	221	D3100	02A04	00004	0.25	436	1696	0.25	1224	4762	0.204	126	798	3066
FL-53	209	D3100	02A05	00001	0.25	352	1494	0.25	912	3871	0.187	126	787	2377
RCA	113	D3200	01V01	00001	2.00	182	9077	2.00	2407	120380	0.129	15.5	2284	111303
RCA	113	D3200	01V01	00002	2.00	184	9177	2.00	2706	135334	0.129	15.5	2297	126157
RCA	120	D3200	02P02	00001	3.00	341	8752	3.00	442	11342	0.039	100	1296	2590

FL-53 is Turbine Bld Heating and ventillation -

FN-6 is Turbine Bld. exhaust fan.

FN-5 is Service Bld exhaust fan

Package	L2P12	UnitDescription	L2P345	Remarks
D0100	01	21' Turbine Building Components	D01	6" contaminated condensate drain line at valve CD-313 (south end, below E-5B)
D0100	01	21' Turbine Building Components	H01	Main Condenser E-10A
D0100	01	21' Turbine Building Components	H02	Main Condenser E-10B, including Hotwell
D0100	01	21' Turbine Building Components	P01	43" suction line to pump P-27C (condensate pit)
D0100	01	21' Turbine Building Components	P02	6" line at valve CD-103 (south end, below E-5B)
D0100	01	21' Turbine Building Components	P03	4" piping downstream of CD-228 (north of condenser by condensate clean up filter)
D0100	01	21' Turbine Building Components	S01	Oxygen analyzer filter FL-75 (north hallway, next to H2 analyzer)
D0100	01	21' Turbine Building Components	S02	Condensate filter FL-76A (northeast of condensate pit)
D0100	01	21' Turbine Building Components	S03	Condensate filter FL-76B (northeast of condensate pit)
D0100	01	21' Turbine Building Components	S04	Condensate filter FL-76C (northeast of condensate pit)
D0100	01	21' Turbine Building Components	S05	Condensate filter FL-76D (north of condenser)
D0100	01	21' Turbine Building Components	T01	Secondary side boration tank TK-112 (south of condensate pit)
D0100	01	21' Turbine Building Components	V01	20" check valve CD-5 (condensate pit)
D0100	01	21' Turbine Building Components	V02	20" check valve CD-15 (condensate pit)
D0100	01	21' Turbine Building Components	V03	12" gate valve CD-97 (north of condenser by condensate clean up filter)
D0100	02	39' Turbine Building Components	M01	Air ejector EJ-1B (northeast)
D0100	02	39' Turbine Building Components	M02	Air ejector EJ-1A (northeast)
D0100	02	39' Turbine Building Components	P01	4" line at valve CD-93 (north of condenser)
D0100	02	39' Turbine Building Components	V01	10" gate valve CD-85 (north of condenser)
D0100	03	Components outside across from equipment hatch	T01	Condensate surge tank TK-122
D0200	01	21' Turbine Building Components	P01	5" line from pump P-76B (south end)
D0200	01	21' Turbine Building Components	P02	1.5" drain line from the clarifier tank sample sink

OUTSIDE RCA

CA OUTSIDE RCA

Package	L2P12	UnitDescription	L2P345	Remarks
D0200	01	21' Turbine Building Components	P03	4" discharge line for clarifier tank sludge
D0200	01	21' Turbine Building Components	P04	3" spoolpiece downstream from valve RW-168 (north wall, overhead)
D0200	01	21' Turbine Building Components	P05	1" hose connection downstream from valve RW-72 (north main walkway)
D0200	01	21' Turbine Building Components	P06	1" line between valve WT-112 & strainer (southwest corner)
D0200	01	21' Turbine Building Components	P07	6" spoolpiece above WT-87 (southwest corner)
D0200	01	21' Turbine Building Components	T01	Clarifier TK-58 (south end)
D0200	01	21' Turbine Building Components	T02	Clarifier blow down sump (south end)
D0200	01	21' Turbine Building Components	T03	Liquid alum storage tank TK-37 (southwest corner)
D0200	01	21' Turbine Building Components	T04	Alum feed tank TK-48 (southwest corner)
D0200	01	21' Turbine Building Components	T05	Caustic feed tank TK-71 (southwest corner)
D0200	01	21' Turbine Building Components	V01	6" check valve WT-42 (south end near ops desk)
D0200	02	61' Turbine Building Components	M01	Raw water vacuum deaerator DA-2 (southwest corner)
D0200	02	61' Turbine Building Components	P01	6" spoolpiece between DA-4 & WT-4 (southwest corner)
D0200	03	Fire Pump House Components	S01	6" strainer STR-1A
D0200	03	Fire Pump House Components	S02	6" strainer STR-1B
D0200	03	Fire Pump House Components	V01	6" check valve RW-14
D0200	03	Fire Pump House Components	V02	1" check valve RW-7
D0200	04	11' Primary Auxiliary Building Components	P01	3" line at valve PW-168 (northwest stairs)
D0300	01	21' Turbine Building Components	P01	1.5" line at valve DW-169 (northwest corner, overhead, above fire door 119)
D0300	01	21' Turbine Building Components	P02	2" line at valve DW-210 (overhead by southwest stairs)
D0300	01	21' Turbine Building Components	P03	1.5" line at valve WW-44 (southwest corner, TK-41, overhead)
D0300	01	21' Turbine Building Components	P04	2.5" line at valves DW-71 & DW-74 (south end, outside DG-1A)
D0300	01	21' Turbine Building Components	P05	2.5" line at DW-173 (south end, outside DG-1A)

Package	L2P12	UnitDescription	L2P345	Remarks
D0300	02	31' Turbine Building Components	P01	2" line at gate valve DW-34 (west side on catwalk)
D0300	02	31' Turbine Building Components	V01	Valve DW-92 (west wall on catwalk)
D0300	03	36' Turbine Building Components	P01	2" line at valve WW-15 (southeast corner over handrail)
D0300	03	36' Turbine Building Components	P02	2" line at valve DW-156 (southeast corner over handrail)
D0300	03	36' Turbine Building Components	P03	3" line at valve DW-43 (southeast corner)
D0300	03	36' Turbine Building Components	P04	2" line at valve DW-64 (southeast corner)
D0300	03	36' Turbine Building Components	P05	2" line at valve WW-54 (southeast corner over handrail)
D0300	03	36' Turbine Building Components	T01	Domestic hot water tank TK-63 (southeast corner)
D0300	03	36' Turbine Building Components	T02	Well water storage tank TK-64 (southeast corner)
D0300	03	36' Turbine Building Components	T03	Well water hydro pneumatic tank TK-77 (southeast corner)
D0300	03	36' Turbine Building Components	T04	Tank TK-105 (southeast corner)
D0300	03	36' Turbine Building Components	T05	Domestic water hydro pneumatic tank TK-27 (southeast corner)
D0300	03	36' Turbine Building Components	U01	Pump P-39 (southeast corner)
D0300	04	Staff Building Boiler Room	P01	2" line at valve DW-67 (down stairs to left)
D0400	01	Sewage Treatment Plant Components	P01	Effluent Discharge to Bay (east of sewage treatment plant on bank)
D0400	01	Sewage Treatment Plant Components	T01	Surge Tank TK-130
D0400	01	Sewage Treatment Plant Components	T02	Aeration Tank TK-131B
D0400	01	Sewage Treatment Plant Components	T03	Sludge Holding Tank TK-132
D0400	01	Sewage Treatment Plant Components	T04	Clarifier Tank TK-129
D0400	02	Yard Area Components	P01	8" Temporary Sanitary Sewer (northeast of office building, between security fences next to tunnel)
D0400	03	Staff Building Components	K01	Staff Building Utility Pit Sump (ground level, south side. access through double doors. receptionist has key)
D0400	03	Staff Building Components	P01	Shower Floor Drain (1st floor, men's bathroom shower stall)
D0400	03	Staff Building Components	P02	Floor Drain (1st floor, women's bathroom)

Package	L2P12	UnitDescription	L2P345	Remarks
D0400	04	Information Building Components	P01	Information Center Clean Out (men's bathroom)
D0400	04	Information Building Components	P02	Information Center Deep Sink Drain Line (storage room)
D0400	05	Service Building Components	P01	3" waste line clean out
D0400	05	Service Building Components	P02	Mezzanine floor drain (behind AC-1B)
D0400	05	Service Building Components	P03	Mezzanine floor drain (below FW-F-307)
D0400	05	Service Building Components	P04	1.5" clean out (floor in hallway outside respirator room)
D0400	05	Service Building Components	P05	2" floor drain (respirator wash room)
D0400	05	Service Building Components	P06	2" cleanout (21' clean wash room, overhead)
D0400	05	Service Building Components	P07	2" cleanout (women's wash room in shower stall floor drain)
D0400	05	Service Building Components	P08	2" P-2 drain (decon shower, next to respirator room)
D0400	05	Service Building Components	P09	2" clean out (secondary lab)
D0500	01	Travel Water Screen Housing	S01	Travel Water Screen Housing SR-1A - located in circulating water pump house
D0500	01	Travel Water Screen Housing	S02	Travel Water Screen Housing SR-1B - located in circulating water pump house
D0500	01	Travel Water Screen Housing	S03	Travel Water Screen Housing SR-1C - located in circulating water pump house
D0500	01	Travel Water Screen Housing	S04	Travel Water Screen Housing SR-1D - located in circulating water pump house
D0500	02	72" Circulating Water Inlet, P-26	P01	72" CW Inlet Pump P-26A - located in circulating water pump house
D0500	02	72" Circulating Water Inlet, P-26	P02	72" CW Inlet Pump P-26B - located in circulating water pump house
D0500	02	72" Circulating Water Inlet, P-26	P03	72" CW Inlet Pump P-26C - located in circulating water pump house
D0500	02	72" Circulating Water Inlet, P-26	P04	72" CW Inlet pump P-26D - located in circulating water pump house
D0500	03	Condenser Water Inlet Box	H01	Condenser Inlet Water Box A -located east of condenser unit
D0500	03	Condenser Water Inlet Box	H02	Condenser Inlet Water Box B -located east of condenser unit
D0500	03	Condenser Water Inlet Box	H03	Condenser Inlet Water Box C -located east of condenser unit
D0500	03	Condenser Water Inlet Box	H04	Condenser Inlet Water Box D -located east of condenser unit

Package	L2P12	UnitDescription	L2P345	Remarks
D0500	04	Water Outlet Box	H01	Outlet Water Box A - located west of condenser unit
D0500	04	Water Outlet Box	H02	Outlet Water Box B - located west of condenser unit
D0500	04	Water Outlet Box	H03	Outlet Water Box D -located west of condenser unit
D0500	04	Water Outlet Box	H04	Outlet Water Box D -located west of condenser unit
D0500	05	102" Discharge Line	P01	102" Discharge Line in turbine building near outlet water
D0500	05	102" Discharge Line	P02	102" Discharge Line in turbine building near outlet water
D0600	01	Circulating Water Pump House Components	P01	3/4" line at valve SW-117 (lower level)
D0600	01	Circulating Water Pump House Components	S01	Screen Wash Pump Suction Strainer STR-2C (lower level, north end)
D0600	01	Circulating Water Pump House Components	S02	Screen Wash Pump Suction Strainer STR-2D (lower level, north end)
D0600	01	Circulating Water Pump House Components	S03	Service Water Strainer STR-64A (lower level, south end)
D0600	01	Circulating Water Pump House Components	S04	Screen Wash Pump Suction Strainer STR-2A (lower level, south end)
D0600	01	Circulating Water Pump House Components	S05	Screen Wash Pump Suction Strainer STR-2B (lower level, south end)
D0600	01	Circulating Water Pump House Components	S06	Strainer STR-46B (21')
D0600	01	Circulating Water Pump House Components	S07	Strainer STR-46A (21')
D0600	01	Circulating Water Pump House Components	S08	Strainer STR-46C (21')
D0600	01	Circulating Water Pump House Components	S09	Strainer STR-46D (21')
D0600	01	Circulating Water Pump House Components	S10	Strainer STR-64D (lower level, north end)
D0600	01	Circulating Water Pump House Components	T01	Sample Head Tank TK-99 (south well, lower level)
D0600	02	Turbine Building 21' Components	H01	Primary Component Cooler E-4A (north hall)
D0600	02	Turbine Building 21' Components	H02	Primary Component Cooler E-5A (north hall)
D0600	02	Turbine Building 21' Components	M01	Liquid Waste Radiation Monitor (north, under E-5A & E-4B)
D0600	02	Turbine Building 21' Components	P01	2" line at valve SW-134 (south end of E-4A)
D0600	02	Turbine Building 21' Components	P02	2.5" line at valve SW-42 (across from ops door)

Package	L2P12	UnitDescription	L2P345	Remarks
D0600	02	Turbine Building 21' Components	S01	Primary Component Cooler Suction Strainer STR-74 (north hall)
D0600	02	Turbine Building 21' Components	S02	Secondary Component Cooler Suction Strainer STR-51(north hall)
D0600	02	Turbine Building 21' Components	U01	Turbine Building Sump Pump P-126 (east wall by access door)
D0600	03	Hot Shop Components	U01	Service Water Sample Pump P-38 (northwest cage under bench)
D0700	01	Fuel Building Components	P01	1" line at valve FS-127 (21' HS-49)
D0700	01	Fuel Building Components	P02	1" line at valve FS-125 (21' HS-50, near roll up door)
D0700	01	Fuel Building Components	P03	1" line at valve FS-126 (40' top of stairs)
D0700	02	Turbine Building Components	P01	5" line (21' southeast overhead, by stairs)
D0700	02	Turbine Building Components	P02	1" line at valve FS-275 (21' northwest corner)
D0700	02	Turbine Building Components	P03	1" line at valve FS-137 (36' hose station next to elevator)
D0700	02	Turbine Building Components	P04	1.5" line at valve FS-77 (61' southeast, HS-22)
D0700	02	Turbine Building Components	P05	1" line at valve FS-274 (21' southwest wall, HS-4)
D0700	02	Turbine Building Components	P06	1.5" line at valve FS-202 (21' southeast, against wall)
D0700	02	Turbine Building Components	S01	18" strainer STR-106 (sits over sump drain, crane bay east wall)
D0700	03	Containment Spray Building Components	P01	1" line at valve FS-132 (39' hose station HS-34)
D0700	03	Containment Spray Building Components	P02	1" line at valve FS-133 (39' hose station HS-33)
D0700	04	Mechanical Penetration Room Components	P01	1" line at valve FS-134 (21' HS-35 hose station)
D0700	05	Yard Components	M01	Fire hydrant at valve FS-92 (beside DWST)
D0700	05	Yard Components	M02	Fire hydrant at valve FS-44 (in front of Admin building)
D0700	05	Yard Components	M03	Fire hydrant at valve FS-31 (RWST area, alley, outside of missile shield)
D0700	06	Service Building Components	P01	2" line at valve FS-64 (stock room, hose station 2)
D0700	07	Fire Pump House Components	K01	Fire pump house sump
D0700	07	Fire Pump House Components	S01	18" strainer STR-4A

Package	L2P12	UnitDescription	L2P345	Remarks
D0700	07	Fire Pump House Components	S02	18" strainer STR-4B
D0700	08	RCA Building Components	P01	1" line at valve FS-128 (21' , HS-51 hose station, Duratek drumming room)
D0700	09	Primary Auxiliary Building Components	P01	1" line at valve FS-120 (36' northwest, HS-43 hose station)
D0700	09	Primary Auxiliary Building Components	P02	1" line at valve FS-116 (at stairway to 11' elev.)
D0700	09	Primary Auxiliary Building Components	P03	1.5" line at valve FS-198 (11' , pipe tunnel entrance, HS-40 hose station)
D0800	01	Turbine Building 21' Components	M01	Centrifuge SE-1
D0800	01	Turbine Building 21' Components	M02	EHC Reservoir
D0800	01	Turbine Building 21' Components	P01	2" outlet spoolpiece from receiver tank TK-108
D0800	01	Turbine Building 21' Components	T01	Waste Oil Sump Tank
D0800	01	Turbine Building 21' Components	T02	Lube Oil Storage Tank TK-22
D0800	01	Turbine Building 21' Components	T03	Sump Waste Collecting Tank TK-75
D0800	02	Turbine Building 39' Components	M01	Ejector EJ-4
D0800	02	Turbine Building 39' Components	P01	3/4" pipe at valve LO-38
D0800	02	Turbine Building 39' Components	P02	3/4" pipe at valve LO-39
D0800	02	Turbine Building 39' Components	T01	Turbine Oil Reservoir TK-57
D0900	01	21' Turbine Building Components	P01	3/4" line at air receiver tank TK-24B (south end)
D0900	01	21' Turbine Building Components	P02	6" line at after cooler E-21A (south end, by DG-1B door)
D0900	01	21' Turbine Building Components	P03	6" line at after cooler E-21B (south end, by DG-1B door)
D0900	01	21' Turbine Building Components	S01	Inlet filters for compressor C-1B (south end)
D0900	01	21' Turbine Building Components	S02	Inlet filters for compressor C-1A (south end)
D0900	01	21' Turbine Building Components	S03	Coalescing filter FL-106 (southwest near TK-40)
D0900	01	21' Turbine Building Components	S04	Inlet filters for compressor C-1D (south end)
D0900	02	39' Turbine Building Components	T01	Instrument air tank TK-84 (south end)

Package	L2P12	UnitDescription	L2P345	Remarks
D0900	03	21' Containment Components	P01	1.5" line at after cooler E-22A (15' from personnel hatch)
D0900	03	21' Containment Components	P02	1.5" line at after cooler E-22B (15' from personnel hatch)
D0900	03	21' Containment Components	P03	2" line between valves CCA-36 & 38 (15' from personnel hatch)
D0900	03	21' Containment Components	P04	2" line between valves CCA-35 & 39 (15' from personnel hatch)
D0900	03	21' Containment Components	S01	Prefilter FL-125A (15' from perssonnel hatch)
D0900	03	21' Containment Components	S02	Prefilter FL-125B (15' from personnel hatch)
D0900	03	21' Containment Components	T01	Air receiver TK-136A (15' from personnel hatch)
D0900	03	21' Containment Components	T02	Air receiver TK-136B (15' from personnel hatch)
D0900	04	Yard Components	S01	Filter air receiver FL-62 (near equipment hatch)
D0900	05	36' PAB Components	P01	3/4" line at valve SA-169 (at BAST)
* D0900	06	21' Valve House Components	T01	Air Receiver TK-25 MAY NEED NEW PHOTO ***
D0900	07	21' Auxiliary Feed Pump Room Components	P01	2" line at valve SA-245
D1000	01	Auxiliary Boiler	T01	Upper Steam Drum for Aux. Boiler B-1A, (Auxiliary Boiler Room)
D1000	01	Auxiliary Boiler	T02	Lower Steam Drum for Aux. Boiler B-1A, (Auxiliary Boiler Room)
D1000	01	Auxiliary Boiler	T03	Burner Box for Aux. Boiler B-1A, (Auxiliary Boiler Room)
D1000	01	Auxiliary Boiler	T04	Upper Steam Drum for Aux. Boiler B-1B, (Auxiliary Boiler Room)
D1000	01	Auxiliary Boiler	T05	Lower Steam Drum for Aux. Boiler B-1B, (Auxiliary Boiler Room)
D1000	01	Auxiliary Boiler	T06	Burner Box for Aux. Boiler B-1B, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	M01	Aux Boiler B-1A Soot Blower, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	M02	Aux Boiler B-1B Soot Blower, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	M03	Exhaust Duct from Boiler B-1A, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	M04	Exhaust Duct from Boiler B-1B, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	P01	Spool piece for the Aux Boiler Feedwater Pump, P-36A, (Auxiliary Boiler Room)

Package	L2P12	UnitDescription	L2P345	Remarks
D1000	02	Auxiliary Boiler Supporting Components	P02	Spool Piece for the Aux. Boiler Feedwater Pump, P-36B, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	S01	Strainer FL-59A, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	T01	Blow Down Tank TK-29, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	T02	Aux. Boiler Condensate Receiver Tank TK-30, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	V01	Valve ACD-73 for the Condensate Makeup Pump, P-35, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	V02	Discharge Check Valve ACD-7, (Auxiliary Boiler Room)
D1000	02	Auxiliary Boiler Supporting Components	V03	Valve ACD-8, pump P-36B discharge check valve (Auxiliary Boiler Room)
D1100	01	21' Turbine Building Components	M01	S/G blow down demineralizer I-6 (southwest)
D1100	01	21' Turbine Building Components	S01	Prefilter FL-84 (southwest)
D1100	01	21' Turbine Building Components	S02	Postfilter FL-85 (southwest)
D1100	02	36' Primary Auxiliary Building Components	H01	S/G blow down cooler E-100 (beside TK-18)
D1100	02	36' Primary Auxiliary Building Components	P01	2" discharge spoolpiece for pump P-136 (beside TK-18)
D1100	02	36' Primary Auxiliary Building Components	P02	3" line at valve BD-197
D1100	02	36' Primary Auxiliary Building Components	T01	S/G blow down tank TK-18
D1100	03	21' Containment Components	S01	S/G E-1-1 wet lay up recirculation filter
D1100	03	21' Containment Components	S02	S/G E-1-2 wet lay up recirculation filter
D1100	03	21' Containment Components	S03	S/G E-1-3 wet lay up recirculation filter
D1200	01	Main Steam Valve House, Level 3	V01	Valve MS-S-13
D1200	01	Main Steam Valve House, Level 3	V02	Valve MS-S-14
D1200	01	Main Steam Valve House, Level 3	V03	Valve MS-S-16
D1200	01	Main Steam Valve House, Level 3	V04	Valve MS-S-23
D1200	01	Main Steam Valve House, Level 3	V05	Valve MS-S-22
D1200	01	Main Steam Valve House, Level 3	V06	Valve MS-S-27

Package	L2P12	UnitDescription	L2P345	Remarks
D1200	01	Main Steam Valve House, Level 3	V07	Valve MS-S-32
D1200	01	Main Steam Valve House, Level 3	V08	Valve MS-S-34
D1200	02	Turbine Building 61'	M01	MSR E-18A
D1200	02	Turbine Building 61'	M02	MSR E-18B
D1200	02	Turbine Building 61'	M03	MSR E-18C
D1200	02	Turbine Building 61'	M04	MSR E-18D
D1200	02	Turbine Building 61'	P01	PI-2310B Piping
D1200	03	Main Steam Valve House, Level 21'	P01	1.5" line at valve HPD-8
D1200	03	Main Steam Valve House, Level 21'	P02	1.5" line at valve MS-P-168
D1200	04	Main Steam Valve House Level 4	P01	30" pipe at valve MS-M-20
D1200	04	Main Steam Valve House Level 4	P02	30" pipe at valve MS-M-10
D1200	04	Main Steam Valve House Level 4	P03	30" pipe at valve MS-M-30
D1200	04	Main Steam Valve House Level 4	P04	6" line at valve MS-79
D1200	04	Main Steam Valve House Level 4	P05	4" pipe at valve MS-M-255
D1300	01	Yard Components	P01	1.5" pipe at valve AST-74, (next to RWST, inside metal shed)
D1300	01	Yard Components	P02	1.5" pipe at valve AS-T-70, (DWST valve cubicle)
D1300	01	Yard Components	V01	Valve AS-T-109, (next to PWST heater E-37)
D1300	02	Valve House 21' Components	P01	3/4" pipe at valve AS-788, (east wall)
D1300	02	Valve House 21' Components	V01	Valve AS-478
D1300	03	Valve House Level 3 Components	V01	Valve AS-63 (valve house, 3rd floor)
D1300	05	PAB 11' Components	P01	Pipe at valve AS-596 (west wall behind TK-3)
D1300	06	PAB 21' Components	P01	1" line at drain trap ACD-113 (east wall)
D1300	06	PAB 21' Components	V01	Valve AS-80

Package	L2P12	UnitDescription	L2P345	Remarks
D1300	06	PAB 21' Components	V02	Valve AS-286 (south hall overhead)
D1300	06	PAB 21' Components	V03	Valve AS-P-591 (south of ops desk)
D1300	07	PAB 36' Components	P01	1" line at valve AS-634 (beside offgas filter A)
D1300	07	PAB 36' Components	P02	2" line at valve AS-735 (beside offgas filter A)
D1300	07	PAB 36' Components	V01	Valve AS-581 (southeast corner)
D1300	08	Duratek Room 21' Components	P01	1" line at valve AS-748
D1300	08	Duratek Room 21' Components	T01	Tank TK-143
D1300	09	Turbine Building 21' Components	P01	2" line at valve AS-P-833 (next to auxiliary boiler room door)
D1300	10	Turbine Building 61' Components	V01	Valve AS-677 (southwest next to fan FN-3A)
D1300	11	Service Building 39' Components	P01	4" line at valve AS-P-3 (below FW-F-207)
D1400	01	Turbine Building 61 ft Elevation - High Pressure Turbine Area	M01	High Pressure Turbine
D1400	01	Turbine Building 61 ft Elevation - High Pressure Turbine Area	M02	High Pressure Turbine
D1400	01	Turbine Building 61 ft Elevation - High Pressure Turbine Area	V01	Stop valve MS-190
D1400	01	Turbine Building 61 ft Elevation - High Pressure Turbine Area	V02	Stop Valve MS-191
D1400	01	Turbine Building 61 ft Elevation - High Pressure Turbine Area	V03	Stop Valve MS-192
D1400	01	Turbine Building 61 ft Elevation - High Pressure Turbine Area	V04	Stop Valve MS-193
D1400	02	Turbine Building 61 ft Elevation - Low Pressure Turbine Area	M01	Low Pressure Turbine LP-1
D1400	02	Turbine Building 61 ft Elevation - Low Pressure Turbine Area	M02	Low Pressure Turbine LP-1
D1400	02	Turbine Building 61 ft Elevation - Low Pressure Turbine Area	M03	Low Pressure Turbine LP-2
D1400	02	Turbine Building 61 ft Elevation - Low Pressure Turbine Area	M04	Low Pressure Turbine LP-2
D1500	01	39' Turbine Building	P01	6" steam line at valve MS-P-143
D1500	01	39' Turbine Building	P02	6" steam line at valve MS-P-142

Package	L2P12	UnitDescription	L2P345	Remarks
D1500	01	39' Turbine Building	P03	8" steam line at valve MS-T-145
D1500	01	39' Turbine Building	P04	8" steam line at valve MS-T-146
D1500	01	39' Turbine Building	P05	8" steam line at valve MS-T-149
D1500	01	39' Turbine Building	P06	8" steam line at valve MS-T-150
D1500	01	39' Turbine Building	P07	8" steam line at valve MS-T-153
D1500	01	39' Turbine Building	P08	8" steam line at valve MS-T-144
D1500	01	39' Turbine Building	P09	8" steam line at valve MS-T-147
D1500	01	39' Turbine Building	P10	8" steam line at valve MS-T-148
D1500	01	39' Turbine Building	P11	8" steam line at valve MS-T-151
D1500	01	39' Turbine Building	P12	8" steam line at valve MS-T-152
D1600	01	21' Turbine Building	H01	First point heater E-11A (near southwest stairs)
D1600	01	21' Turbine Building	H02	First point heater E-11B (near southwest stairs)
D1600	01	21' Turbine Building	P01	6" recirc line at valve FW-F-7 (behind tool cage)
D1600	01	21' Turbine Building	P02	6" recirc line at valve FW-F-8 (behind tool cage)
D1600	01	21' Turbine Building	P03	10" pipe at valve FW-A-342, (south end)
D1600	01	21' Turbine Building	P04	27" line at valve FW-M-336 (next to pump P-2A)
D1600	01	21' Turbine Building	T01	Seal water receiver tank TK-35 (north of southwest stairs)
D1600	02	36' Turbine Building	P01	18" line downstream of FW-36 (southwest corner)
D1600	02	36' Turbine Building	P02	18" line downstream of FW-37 (southwest corner)
D1600	02	36' Turbine Building	P03	18" line at check valve FW-17 (south end under grating)
D1600	02	36' Turbine Building	P04	18" line at check valve FW-18 (south end under grating)
D1600	02	36' Turbine Building	P05	1" line at valve FW-334 (southeast corner above handrail on stairs)
D1600	03	21' Service Building	P01	14" line at valve FW-M-304 (beside gaitronics)

Package	L2P12	UnitDescription	L2P345	Remarks
D1600	03	21' Service Building	P02	14" line at valve FW-M-204 (beside gaitronics)
D1700	01	Emergency Feed Pump Room Components	P01	8" line at pump P-25C
D1700	01	Emergency Feed Pump Room Components	P02	8" line at pump P-25B
D1700	01	Emergency Feed Pump Room Components	P03	8" line at valve EFW-3
D1700	01	Emergency Feed Pump Room Components	P04	1" line at valve EFW-11
D1700	01	Emergency Feed Pump Room Components	P05	3" line at valve EFW-A-301
D1700	01	Emergency Feed Pump Room Components	P06	3" and 6" lines at valve EFW-100
D1700	01	Emergency Feed Pump Room Components	P07	1" line at valve EFW-311
D1700	01	Emergency Feed Pump Room Components	P08	6" line at valve EFW-316
D1700	01	Emergency Feed Pump Room Components	P09	4" line at valve EFW-317 and EFW-23
D1700	01	Emergency Feed Pump Room Components	P10	3" line at valve EFW-203
D1700	01	Emergency Feed Pump Room Components	P11	6" line downstream of EFW-17
D1700	01	Emergency Feed Pump Room Components	U01	Emergency feed pump P-25A
D1700	01	Emergency Feed Pump Room Components	V02	Valve EFW-17
D1700	02	Demineralized Water Storage Tank Room Components	P01	1" line at valve AFW-26
D1700	02	Demineralized Water Storage Tank Room Components	P02	1" line at valve AFW-359 (above pump P-25)
D1700	02	Demineralized Water Storage Tank Room Components	P03	1.5" and 3" lines at valve AFW-372
D1700	02	Demineralized Water Storage Tank Room Components	P04	1.5" line at valve EFW-37
D1700	03	39' Turbine Building Components	P01	4" line at valve AFW-33 (west side)
D1700	03	39' Turbine Building Components	P02	2" line at valve AFW-30 (west side)
D1700	03	39' Turbine Building Components	P03	4" line at valve AFW-28 (west side)
D1800	01	Turbine Building 21' Elevation	M03	Extraction Heater E-13A
D1800	01	Turbine Building 21' Elevation	M04	Extraction Heater E-14A

Package	L2P12	UnitDescription	L2P345	Remarks
D1800	01	Turbine Building 21' Elevation	M05	Extraction Heater E-15A
D1800	01	Turbine Building 21' Elevation	M06	Extraction Heater E-13B
D1800	01	Turbine Building 21' Elevation	M07	Extraction Heater E-14B
D1800	01	Turbine Building 21' Elevation	M08	Extraction Heater E-15B
D1800	01	Turbine Building 21' Elevation	M09	Heater Drain Cooler E-17A
D1800	01	Turbine Building 21' Elevation	M10	Heater Drain Cooler E-17B
D1800	01	Turbine Building 21' Elevation	S01	Strainer STR-3-P62A
D1800	01	Turbine Building 21' Elevation	S02	Strainer STR-3-P62B
D1800	01	Turbine Building 21' Elevation	T01	Heater Drain Receiver Tank, TK-19
D1800	01	Turbine Building 21' Elevation	V01	Check valve HD-116
D1800	01	Turbine Building 21' Elevation	V02	Check valve HD-117
D1800	02	Turbine Building 39' Elevation	M01	Extraction Heater E-16A
D1800	02	Turbine Building 39' Elevation	M02	Extraction Heater E-16B
D1800	02	Turbine Building 39' Elevation	T01	Heater Drain Receiver Tank TK-20A
D1800	02	Turbine Building 39' Elevation	T02	Heater Drain Receiver Tank TK-20B
D1800	03	Turbine Building 61' Elevation	M01	Extraction Heater E-12A
D1800	03	Turbine Building 61' Elevation	M02	Extraction Heater E-12B
D1900	01	21' Turbine Building Components	S01	Component cooling water filter FL-67 (north side)
D1900	01	21' Turbine Building Components	S02	Component cooling water filter FL-69 (north side)
D1900	01	21' Turbine Building Components	S03	Secondary component cooling filter FL-68 (northwest)
D1900	02	39' Turbine Building Components	H01	Turbine lube oil cooler E-7B (southeast, near FEMCO)
D1900	02	39' Turbine Building Components	H02	Turbine lube oil cooler E-7A (southeast, near FEMCO)
D1900	03	61' Turbine Building Components	T01	Primary component cooling surge tank TK-5 (west wall)

Package	L2P12	UnitDescription	L2P345	Remarks
D1900	03	61' Turbine Building Components	T02	Secondary component cooling surge tank TK-59 (west wall)
D1900	04	21' Primary Auxiliary Building Components	P01	2" line PCC-77-151R3, reactor coolant sample heat exchanger combined return header (sample room)
D1900	05	36' Primary Auxiliary Building Components	P01	2.5" line PCC-405-151R3
D1900	06	-2' Containment Building Components	P01	6" line PCC-237-151R3, Reactor coolant pump return header (at valve PCC-A-252)
D1900	06	-2' Containment Building Components	P02	3" line PCC-36-151R3, CEDM cooler return (at valve PCC-263)
D1900	06	-2' Containment Building Components	P03	3" line PCC-384-151R3, CEDM air cooler return (at valve PCC-265)
D2000	01	21' Turbine Building Components	D01	Drain trap off separator at AR-101 (crane bay, west wall)
D2000	01	21' Turbine Building Components	D02	Drain trap off separator at AR-114 (crane bay, west wall)
D2000	01	21' Turbine Building Components	M01	6" collector at AR-149 (EJ-1A, crane bay)
D2000	01	21' Turbine Building Components	M02	6" collector CL-151 at AR-149 (EJ-1B, crane bay)
D2000	01	21' Turbine Building Components	P01	Drain tap off separator at AR-100 (above CARDOX unit)
D2000	01	21' Turbine Building Components	P02	Separator at AR-114 (above CARDOX unit)
D2000	01	21' Turbine Building Components	P03	4" line at pump P-28A (north side)
D2000	01	21' Turbine Building Components	P04	4" line at pump P-28B (north side)
D2000	01	21' Turbine Building Components	V01	8" check valve AR-2 (north side, pump P-28A suction)
D2000	01	21' Turbine Building Components	V02	8" check valve AR-2 (north side, pump P-28A suction)
D2000	02	39' Turbine Building Components	M01	8" vacuum breaker at AR-92
D2000	02	39' Turbine Building Components	P01	1" line at filter 1801A flow indicator (northeast, above air ejectors)
D2000	02	39' Turbine Building Components	P02	1" line at filter 1801B flow indicator (northeast, above air ejectors)
D2000	02	39' Turbine Building Components	P03	4" line at relief valve AR-S-93 (near air ejector EJ-1A)
D2000	02	39' Turbine Building Components	P04	4" line at relief valve AR-S-107 (near air ejector EJ-1B)
D2000	02	39' Turbine Building Components	V01	8" valve AR-125 (EJ-1A hogger suction)
D2000	02	39' Turbine Building Components	V02	8" valve AR-126 (EJ-1B hogger suction)

Package	L2P12	UnitDescription	L2P345	Remarks
D2000	03	61' Turbine Building Components	M01	Separator downstream of silencer SE (northeast corner)
D2000	03	61' Turbine Building Components	P01	2" line at ARP-11 (west side)
D2000	03	61' Turbine Building Components	T01	Vacuum priming tank TK-23 (west side)
D2100	01	21' Turbine Building Components	M01	Circ water Amertap ball collector basket AMT-1 (west of condenser)
D2100	01	21' Turbine Building Components	M02	Circ water Amertap ball collector basket AMT-2 (west of condenser)
D2100	01	21' Turbine Building Components	M03	Circ water Amertap ball collector basket AMT-3 (west of condenser)
D2100	01	21' Turbine Building Components	M04	Circ water Amertap ball collector basket AMT-4 (west of condenser)
D2100	01	21' Turbine Building Components	M05	Service water Amertap ball collector basket AMT-5 (west of condenser)
D2100	01	21' Turbine Building Components	P01	3" spoolpiece downstream of valve AT-10 (east side, crane bay area)
D2100	01	21' Turbine Building Components	P02	3" line at valve AT-4 (west of condenser)
D2100	01	21' Turbine Building Components	P03	3" spoolpiece at valve AT-20 (east side, crane bay area)
D2100	01	21' Turbine Building Components	P04	3" line at valve AT-14 (west of condenser)
D2100	01	21' Turbine Building Components	P05	3" spoolpiece downstream of valve AT-30 (east side, crane bay area)
D2100	01	21' Turbine Building Components	P06	3" line at valve AT-24 (west of condenser)
D2100	01	21' Turbine Building Components	P07	3" spoolpiece downstream of valve AT-40 (east side, crane bay area)
D2100	01	21' Turbine Building Components	P08	3" line at valve AT-34 (west of condenser)
D2100	01	21' Turbine Building Components	P09	3" line at service water ball distributer (above E4-A)
D2100	01	21' Turbine Building Components	P10	3" line at valve SW-175 (below E-4A outlet)
D2100	01	21' Turbine Building Components	P11	3" line at valve SW-176 (below E-5B outlet)
D2200	01	Turbine Building 21'	P01	1" line at SSL-156 (electric S/G feed pump P-2A inboard vent)
D2200	01	Turbine Building 21'	P02	1" line at FW-45 (electric S/G feed pump P-2A outboard vent)
D2200	01	Turbine Building 21'	P03	4" line at valve SSL-76 at seal water return pump P-76
D2200	01	Turbine Building 21'	P04	3" line at valve SSL-A-79

Package	L2P12	UnitDescription	L2P345	Remarks
D2200	01	Turbine Building 21'	P05	3" line at check valve SSL-1 (condensate pit)
D2200	01	Turbine Building 21'	P06	3" line at check valve SSL-3 (condensate pit)
D2200	01	Turbine Building 21'	P07	2" line at valves SSL-119 & 120 (southeast by stairs)
D2200	01	Turbine Building 21'	P08	1" line at valve SSL-52 (southeast corner on platform)
D2200	01	Turbine Building 21'	S01	Supply filter FL-46A
D2200	01	Turbine Building 21'	S02	Supply filter FL-46B
D2200	01	Turbine Building 21'	S03	Strainer STR-13 (north of southwest stairs by P-62A)
D2200	01	Turbine Building 21'	S04	Strainer STR-14 (north of southwest stairs by P-62A)
D2200	01	Turbine Building 21'	T01	Seal water receiver TK-35 (middle area column T8)
D2200	01	Turbine Building 21'	V01	Check valve SSL-77 (next to tank TK-35)
D2200	02	Turbine Building 39'	P01	1" line at check valve SSL-55 (southwest stairs, 2nd platform, over handrail)
D2300	01	Diesel Generator DG-1A, 21' elevation	A01	Turbo combustion air inlet duct
D2300	01	Diesel Generator DG-1A, 21' elevation	A02	Air box inspection cover for cylinders 1 and 4
D2300	01	Diesel Generator DG-1A, 21' elevation	M01	Crankcase inspection cover for cylinders 13 and 18
D2300	01	Diesel Generator DG-1A, 21' elevation	P01	6" return line for engine jacket water
D2300	01	Diesel Generator DG-1A, 21' elevation	S01	Air intake filter (lower 3)
D2300	01	Diesel Generator DG-1A, 21' elevation	S02	Engine lube oil strainer
D2300	02	Diesel Generator DG-1B, 21' elevation	A01	Turbo combustion air inlet duct
D2300	02	Diesel Generator DG-1B, 21' elevation	A02	Air box inspection cover for cylinders 1 and 4
D2300	02	Diesel Generator DG-1B, 21' elevation	M01	Crancase inspection cover for cylinders 13 and 18
D2300	02	Diesel Generator DG-1B, 21' elevation	P01	6" return line for engine jacket water
D2300	02	Diesel Generator DG-1B, 21' elevation	S01	Air intake filter (lower 3)
D2300	02	Diesel Generator DG-1B, 21' elevation	S02	Engine lube oil strainer

Package	L2P12	UnitDescription	L2P345	Remarks
D2400	01	Auxiliary Feed Pump Room Components	T01	Auxiliary chemical feed tank TK-89
D2400	01	Auxiliary Feed Pump Room Components	U01	Chemical feed tank pump P-115
D2400	02	21' Turbine Building Components	M01	Secondary sample sink (near break room door)
D2400	02	21' Turbine Building Components	P01	1.25" drain line from secondary sample sink (near break room door)
D2400	02	21' Turbine Building Components	S01	Strainer 59A (southwest by ops desk)
D2400	02	21' Turbine Building Components	S02	Strainer 58 (southwest by ops desk)
D2400	02	21' Turbine Building Components	T01	Hydrazine feed tank to water treatment TK-46B (southwest by ops desk)
D2400	02	21' Turbine Building Components	T02	Hydrazine / morpholine tank to auxiliary boiler TK-46A (southwest by ops desk)
D2400	02	21' Turbine Building Components	T03	Hydrazine / morpholine tank to S/G feed TK-45 (southwest by ops desk)
D2400	02	21' Turbine Building Components	U01	Hydrazine / morpholine pump P-44A (southwest by ops desk)
D2400	02	21' Turbine Building Components	U02	Hydrazine / morpholine pump P-44B (southwest by ops desk)
D2400	02	21' Turbine Building Components	U03	Hydrazine pump P-45 (southwest by ops desk)
D2400	03	36' Primary Auxiliary Building Components	M01	Blow down sample sink (north hallway)
D2400	03	36' Primary Auxiliary Building Components	P01	1" drain line from blow down sample sink (north hallway)
D2500	01	Turbine Building 21' Components	D01	High Pressure Drain Trap TR-I4
D2500	01	Turbine Building 21' Components	D02	High Pressure Drain Trap TR-19
D2500	01	Turbine Building 21' Components	D03	High Pressure Drain Trap TR-15
D2500	01	Turbine Building 21' Components	V01	Valve HPD-A-100
D2500	02	Turbine Building 36' Components	D01	High Pressure Drain Trap TR-21
D2500	03	Mechanical Penetration Room 21' Components	D01	High Pressure Drain Trap TR-1
D2500	03	Mechanical Penetration Room 21' Components	D02	High Pressure Drain Trap TR-3
D2500	03	Mechanical Penetration Room 21' Components	D03	High Pressure Drain Trap TR-32
D2500	03	Mechanical Penetration Room 21' Components	D04	High Pressure Drain Trap TR-23

Package	L2P12	UnitDescription	L2P345	Remarks
D2600	01	Environmental Services Laboratory Basement	D01	1.5" drain line from bathroom, (middle of room, overhead)
D2600	01	Environmental Services Laboratory Basement	D02	4" drain line & trap from bathroom, (east, overhead)
D2600	01	Environmental Services Laboratory Basement	D03	4" drain line to septic tank, (middle & west, overhead)
D2600	01	Environmental Services Laboratory Basement	D04	4" alternate drain line, (south wall 3' above floor)
D2600	01	Environmental Services Laboratory Basement	D05	1.5" drain line from kitchen sink, (west, overhead)
D2600	01	Environmental Services Laboratory Basement	D06	4" drain line from kitchen, (southeast, overhead)
D2600	02	Environmental Services Laboratory	D01	1.5" drain line & trap, (under bathroom sink)
D2600	02	Environmental Services Laboratory	D02	1.5" drain line and trap, (under kitchen sink)
D2600	03	Environmental Services Laboratory Yard	D01	4" alternate drain line, (75' from building)
D2700	01	Administration Building	A01	Filter mix box, (outside administration building)
D2700	01	Administration Building	A02	Gatehouse supply duct, (over first exit portal monitor)
D2700	01	Administration Building	A03	Gatehouse return duct, (near floor next to first exit portal monitor)
D2700	01	Administration Building	A04	Clerical area supply duct
D2700	01	Administration Building	A05	Guard area supply duct, (behind first door on left)
D2800	01	Information Building	A01	HVAC unit inlet plenum
D2800	01	Information Building	A02	24" x 8" return duct, (northwest side of conference room)
D2800	01	Information Building	A03	36" x 14" return duct, (corridor outside records room)
D2800	01	Information Building	A04	26" x 10" return duct, (corridor # 2)
D2800	01	Information Building	S01	HVAC unit outside air filter / filter compartment.
D3000	01	Staff Building First Floor Components	A01	HTP-102 supply duct (hallway outside room 103)
D3000	01	Staff Building First Floor Components	S01	Emergency ventilation supply filter unit (room 116)
D3000	01	Staff Building First Floor Components	S02	Emergency ventilation recirculation filter unit (room 116)
D3000	02	Staff Building Second Floor Components	A01	Main lobby supply duct

Package	L2P12	UnitDescription	L2P345	Remarks
D3000	03	Staff Building Third Floor Components	A01	Return air vent (body count room)
D3000	03	Staff Building Third Floor Components	A02	Return air vent (outside room 334)
D3000	04	Staff Building Fourth Floor Components	A01	Return air vent (outside room 414)
D3000	04	Staff Building Fourth Floor Components	A02	Fan 56 ducting (room 409)
D3000	04	Staff Building Fourth Floor Components	A03	Emergency vent damper for Fan 52 (room 409)
D3000	04	Staff Building Fourth Floor Components	S01	Filter housing for Fan 52 (room 409)
D3100	01	21' Service Building	A01	RCP shop exhaust hood
D3100	01	21' Service Building	A02	MOV room exhaust hood
D3100	01	21' Service Building	A03	RCA shop exhaust hood
D3100	01	21' Service Building	A04	RCA shop welding hood & duct
D3100	01	21' Service Building	A05	RCA PC changing area exhaust duct
D3100	01	21' Service Building	A06	Chemistry lab exhaust hood
D3100	01	21' Service Building	A07	Exhaust duct (auxiliary boiler room)
D3100	02	36' Service Building	A01	Exhaust duct for fan FN-15 (behind survey room)
D3100	02	36' Service Building	A02	Exhaust duct and fan FN-5 (behind survey room)
D3100	02	36' Service Building	A03	Exhaust duct FL-57 (behind survey room)
D3100	02	36' Service Building	A04	Exhaust duct and fan FN-6 (behind survey room)
D3100	02	36' Service Building	A05	Exhaust duct for FL-53 (behind survey room)
D3100	02	36' Service Building	A06	Exhaust duct for 2nd floor planning office
D3100	02	36' Service Building	A07	Exhaust plenum for FL-19B
D3100	02	36' Service Building	H01	AC-1B cooling & heating coils
D3100	02	36' Service Building	H02	AC-1A heating & cooling coils
D3100	02	36' Service Building	M01	Exhaust fan FN-9A

Package	L2P12	UnitDescription	L2P345	Remarks
D3100	02	36' Service Building	M02	Exhaust fan FN-22
D3100	02	36' Service Building	S01	Filter FL-28 and exhaust duct (behind survey room)
D3200	01	21' Primary Auxiliary Building Components	P01	1" line at valve N-S-25 (south hallway, overhead)
D3200	01	21' Primary Auxiliary Building Components	V01	Pressure Regulating Valve N-P-43 (south hallway)
D3200	01	21' Primary Auxiliary Building Components	V02	Valve N-A-66 (High Pressure Safety Injection Room)
D3200	02	36' Primary Auxiliary Building Components	P01	3/4" line at valve N-74 (next to tank TK-3)
D3200	02	36' Primary Auxiliary Building Components	P02	3/4" line at valve FR-0500 (south wall)
D3200	03	21' Service Building Components	P01	1" line at valve N-78 (outside PAB door, overhead)
D3200	04	Gas House Components	P01	1.5" line at valve N-21
D3200	05	21' Turbine Building Components	P01	1" line at valve H-22 (north side)
D3200	05	21' Turbine Building Components	P02	8" pipe at hydrogen dryer DH-6 (north side)
D3200	06	39' Turbine Building Components	M01	Condensate collector MS-531A (north side)
D3200	06	39' Turbine Building Components	M02	Condensate collector MS-531B (north side)
D3200	06	39' Turbine Building Components	M03	Condensate collector MS-531C (north side)
D9900	01	D1200, Main & Reheat Steam	P01	Valve MS-M-255 (D1200-04P05) Main steam valve house level 2
D9900	01	D1200, Main & Reheat Steam	P02	Valve MS-79 (D1200-04P04) Main steam valve house level 3
D9900	02	D1400, Main Turbine & Turbine Control	M01	Low Pressure Turbine LP-1 (D1400-02M01) 61' TB
D9900	02	D1400, Main Turbine & Turbine Control	M02	Low Pressure Turbine LP-2 (D1400-02M03) 61' TB
D9900	02	D1400, Main Turbine & Turbine Control	M03	High Pressure Turbine (D1400-01M01) 61' TB
D9900	02	D1400, Main Turbine & Turbine Control	V01	Stop Valve MS-193 (D1400-01V04) 61' TB, HP turbine area
D9900	02	D1400, Main Turbine & Turbine Control	V02	Stop Valve MS-190 (D1400-01V01) 61' TB
D9900	03	D1800, Heater Drain & Extraction Steam	M01	Extraction Heater E-16A (D1800-02M01) 39' TB
D9900	03	D1800, Heater Drain & Extraction Steam	M02	Extraction Heater E-12A (D1800-03M01) 61' TB

Package	L2P12	UnitDescription	L2P345	Remarks
D9900	03	D1800, Heater Drain & Extraction Steam	M03	Extraction Heater E-14B (D1800-01M07) 21' TB
D9900	03	D1800, Heater Drain & Extraction Steam	M04	Extraction Heater E-15B (D1800-01M08) 21' TB
D9900	03	D1800, Heater Drain & Extraction Steam	M05	Extraction Heater E-13A (D1800-01M03) 21' TB
D9900	03	D1800, Heater Drain & Extraction Steam	M06	Extraction Heater E-14A (D1800-01M04) 21' TB
D9900	03	D1800, Heater Drain & Extraction Steam	S01	Strainer STR-3-P62A (D1800-01S01) 21' TB
D9900	03	D1800, Heater Drain & Extraction Steam	V01	Check Valve HD-116 (D1800-01V01) 21' TB
D9900	03	D1800, Heater Drain & Extraction Steam	V02	Check Valve HD-117 (D1800-01V02) 21' TB
D9900	04	D2500, High Pressure Drains	D01	High Pressure Drain Trap TR-15 (D2500-01D03) 21' TB
D9900	04	D2500, High Pressure Drains	D02	High Pressure Drain Trap TR-21 (D2500-02D01) 36' TB
D9900	04	D2500, High Pressure Drains	D03	High Pressure Drain Trap TR-1 (D2500-03D01) 21' Mechanical Penetration Room