

100-111111-112

RADIOANALYTICAL REPORT

prepared for


Joe Walden
Farley Nuclear Power Plant
Alabama Power Company

by

the Staff of the
Nuclear Environmental Services Radioanalytical Laboratory

Science Applications, Inc.
3 Choke Cherry Road
Rockville, MD 20850
301-977-4480

Reviewed By


Philip J. Unrein, Ph.D.
Senior Chemist

September 30, 1983

This report contains all requested data obtained from the sample shipment received at Rockville on August 15, 1983. Data were produced and documented in accordance with approved quality control and quality assurance procedures. Please direct any questions concerning these data to Kelvin Wright, Project Manager, or Larry Coe, Manager, Nuclear Environmental Services Division.

1

Unit 1

08-83

Waste Monitor Tank Demineralizer

EP-83

Total TRU = 5.92 nci/gm
Total α TRU = 0.54 nci/gm
Total B TRU = 5.38 nci/gm

15/11/2015

Plant Name : FARELY Unit 1
 Sample Type : Dry Active Waste (P₂O₅, H₂O₂, Lab T₂O₂, etc.)
 Reference Date (mm-dd-yy) : 08-02-83
 Plant Sample ID : DAW SAI #3
 SAI Sample # : 10252
 Analysis Reporting Date : 30-SEP-83
 Sample weight (gms) : 5.60

Nuclide	Measured Concentration (uCi/gram)		Nuclide	Measured Concentration (uCi/gram)	
	Value	% Uncer.		Value	% Uncer.
3 H	< 7.6E-05		241-Pu	4.2E-04	31
14 C	2.1E-04	36	241-Am	1.6E-06	18
51 Cr	< 2.3E-05		242-Cm	3.1E-07	44
54 Fe	1.75E-05	7	243, 244-Cm	7.0E-07	28
58 Co	3.31E-05	5			
59 Ni	< 3.5E-04				
60 Co	2.85E-04	5			
63 Ni	< 4.9E-04				
65 Zn	< 9.0E-07				
89 Sr	1.1E-04	34			
90 Sr	< 3.6E-05				
94 Rb	< 1.9E-05				
95 Rb	6.60E-05	5			
95 Zr	2.5E-05	17			
97 Tc	< 1.7E-05				
103 Ru	4.7E-05	24			
110m Ag	< 3.2E-05				
124 Sb	< 3.3E-07				
127 I	< 1.2E-05				
131 I	3.8E-05	65			
134 Cs	2.7E-05	44			
137 Cs	< 5.5E-07				
141 Ce	1.7E-05	51			
144 Ce/Pr	3.92E-05	8			
237 Bp + 242Pu	< 5.0E-05				
238 Pu	4.8E-05	11			
239, 240 Pu	3.0E-05	14			

Total TRU = 0.135 uCi/gm.
 Total α TRU = 0.011 uCi/gm.
 Total β TRU = 0.42 uCi/gm.

10/2/83
 12/2/83

R A D I O A C T I V E S A M P L E A N A L Y S I S

70
0373
JUN 1

Plant Name : FARKLEY Unit :
 Sample Type : Crud Flux : 1.4E+04 nCi/gm
 Reference Date (mm-dd-yy) : 08-05-83
 Plant Sample ID : U/1 SAI #7
 SAI Sample # : 10233
 Analysis Reporting Date : 30-SEP-83
 Sample weight (gms) : 12.80

Measured Concentration (nCi/gram)		Measured Concentration (nCi/gram)	
Nuclide	Value	Nuclide	Value
241-Pu	2.36E-02	241-Pu	2.36E-02
241-Am	2.0E-05	241-Am	2.0E-05
242-Cm	1.59E-04	242-Cm	1.59E-04
243,244-Cm	7.3E-06	243,244-Cm	7.3E-06

Total TRU = 23.8 nCi/gm.
 Total α TRU = 0.50 nCi/gm.
 Total β TRU = 23.6 nCi/gm.

Measured Concentration (nCi/gram)		Measured Concentration (nCi/gram)	
Nuclide	Value	Nuclide	Value
14-C	1.5E-03	241-Pu	2.36E-02
51-Cr	1.85E-03	241-Am	2.0E-05
54-Mn	1.9E-02	242-Cm	1.59E-04
58-Cu	3.20E-02	243,244-Cm	7.3E-06
59-Ni	4.20E-01		
60-Co	2.6E-03		
64-Ni	7.33E-01		
65-Zn	1.89E-01		
69-Sr	1.4E-03		
90-Sr	2.47E-03		
94-Nb	1.23E-03		
95-Nb	8.55E-04		
95-Zr	2.47E-01		
99-Tc	9.92E-02		
103-Ru	2.6E-05		
110m-Ag	1.93E-02		
125-Sb	4.06E-02		
129-I	7.0E-03		
131-I	6.6E-06		
134-Cs	1.3E-03		
137-Cs	2.6E-03		
141-Ce	7.0E-04		
144-Ce/Pr	6.2E-03		
237-Np	1.57E-01		
238-Pu	3.7E-06		
239-Pu	2.97E-05		
240-Pu	4.51E-04		

R A D I O A C T I V E S A M P L E A N A L Y S I S

Plant Name : FARLEY Unit 1
 Sample Type : Filter Sludge WASTE HOLDUP TANK SLUDGE
 Reference Date (mm-dd-yy) : 08-10-83
 Plant Sample ID : SAI #13 WHI SLGE
 SAI Sample # : 10234
 Analysis Reporting Date : 30-SEP-83
 Sample weight (gms) : 24.10

Measured Concentration (uCi/gram)			Measured Concentration (uCi/gram)		
Nuclide	Value	% Uncer.	Nuclide	Value	% Uncer.
3 H	4.60E-02	5	239,240-Pu	1.72E-04	5
14 C	8.37E-03	5	241-Pu	5.48E-03	5
51 Cr	<2.4E-03		241-Am	6.80E-06	5
54 Mn	2.88E-02	5	242-Cm	3.07E-05	5
58 Co	1.57E-01	5	243,244-Cm	1.2E-06	13
59 Ni	2.53E-03	6			
60 Co	1.01E+00	5			
63 Ni	1.93E-01	5			
65 Zn	<1.2E-03				
87 Sr	2.89E-03	5			
90 Sr	1.47E-03	5			
94 Nb	8.95E-05	5			
95 Nb	8.58E-02	5			
95 Zr	3.43E-02	5			
99 Tc	6.02E-05	7			
103 Ru	5.3E-03	19			
110m Ag	4.31E-02	5			
124 Sb	<3.1E-04				
125 Sb	7.9E-03	21			
129 I	<1.6E-05				
131 I	<4.6E-04				
134 Cs	4.9E-03	73			
137 Cs	<5.3E-04				
141 Ce	1.7E-03	44			
144 Ce/Pr	5.80E-02	5			
237 Np+242Pu	6.4E-07	10			
238 Pu	9.02E-06	5			

Total TRU = 5.62 nCi/gm

Total < TRU = 0.21

Total B TRU = 5.48 nCi/gm

(2.1.12)

RADIOACTIVE SAMPLE ANALYSIS

Plant Name : FARLEY Unit 1
 Sample Type : Filter-Sludge Mechanical Filter (random source)
 Reference Date (mm-dd-yy) : 08-03-83
 Plant Sample ID : SAI #5 MECH. Fil
 SAI Sample # : 10235
 Analysis Reporting Date : 30-SEP-83
 Sample weight (gms) : 4.30

Measured Concentration (uCi/gram)		
Nuclide	Value	% Uncer.
3-H	<2.5E-04	
14-C	9.2E-04	10
51-Cr	<1.5E-03	
54-Mn	5.8E-03	13
58-Co	2.90E-02	5
59-Ni	<3.1E-04	
60-Co	1.26E-01	5
63-Ni	1.20E-02	5
65-Zn	<5.4E-04	
89-Sr	2.6E-04	18
90-Sr	2.2E-04	11
94-Nb	<8.4E-05	
95-Nb	2.87E-02	5
95-Zr	1.2E-02	11
99-Tc	2.7E-05	26
103-Ru	2.7E-03	25
110m-Ag	9.38E-03	9
124-Sb	<1.2E-04	
125-Sb	2.9E-03	45
129-I	6.82E-05	8
131-I	<4.7E-04	
134-Cs	<2.1E-04	
137-Cs	<3.1E-04	
141-Ce	<9.8E-04	
144-Ce/Pr	1.83E-02	8
237-Np+242Pu	<2.2E-07	
238-Pu	6.3E-06	17

Measured Concentration (uCi/gram)		
Nuclide	Value	% Uncer.
239,240-Pu	2.06E-05	9
241-Pu	6.35E-04	8
241-Am	2.2E-06	30
242-Cm	1.1E-05	14
243,244-Cm	4.8E-06	20

Total TRU = 0.67 nCi/gm.
 Total α TRU = 0.04 nCi/gm.
 Total β TRU = 0.63 nCi/gm.

RADIOACTIVE SAMPLE ANALYSIS

Plant Name : FARLEY Unit 1

Sample Type : Dry Active Waste

Reference Date (mm-dd-yy) : 08-02-83

Plant Sample ID : SAI #9 NOPHEADS

SAI Sample # : 10236

Analysis Reporting Date : 30-SEP-83

Sample weight (gms) : 5.10

(HOLMDEL DRY TAILING AREA)
(BENTLEY YOUNG TAILING AREA)

Measured Concentration (uCi/gram)		
Nuclide	Value	% Uncer.
3 H	<6.1E-05	
14 C	1.3E-04	63
51 Cr	<2.8E-04	
54 Mn	3.07E-03	5
58 Co	3.04E-03	5
59 Ni	<1.1E-03	
60 Co	3.29E-02	5
63 Ni	4.12E-03	5
65 Zn	<1.2E-04	
89 Sr	1.2E-04	23
90 Sr	1.1E-04	12
94 Nb	<3.4E-05	
95 Nb	<5.4E-05	
99 Tc	<1.2E-05	
110m Ag	6.6E-04	10
124 Sb	<3.5E-05	
125 Sb	<2.9E-04	
129 I	<3.9E-06	
131 I	<9.3E-05	
134 Cs	4.76E-03	5
137 Cs	1.53E-02	5
141 Ce	<2.6E-05	
144 Ce/Pr	<8.7E-05	
237-Np+242Pu	<6.8E-07	
238 Pu	4.2E-06	22
239, 240-Pu	7.4E-06	16
241 Pu	3.2E-04	26

Measured Concentration (uCi/gram)		
Nuclide	Value	% Uncer.
241-Am	2.1E-06	41
242-Cm	<6.4E-07	
243, 244-Cm	2.3E-06	40

Total TRO = 0.34 nCi/gm.

Total <TRO = 0.02 nCi/gm.

Total βTRO = 0.32 nCi/gm.

10/2/83

RADIOACTIVE SAMPLE ANALYSIS

Plant Name : FARLEY
 Sample Type : Resin
 Reference Date (mm-dd-yy) : 08-09-83
 Plant Sample ID : SAI #12 1B MIX B
 SAI Sample # : 10237
 Analysis Reporting Date : 30-SEP-83
 Sample weight (gms) : 5.50

Unit 1
1B MIXED BED RESIN

Measured Concentration (uCi/gram)		
Nuclide	Value	% Uncer.
3 H	5.7E-03	12
14 C	1.44E-02	6
51 Cr	<1.1E-01	
54 Mn	2.2E-01	23
58 Co	5.00E+00	5
59 Ni	1.24E-01	5
60 Co	1.44E+01	5
63 Ni	9.09E+00	5
65 Zn	<4.2E-02	
89 Sr	1.27E-01	5
90 Sr	9.91E-02	5
94 Nb	2.9E-04	13
95 Nb	<1.8E-02	
95 Zr	4.4E-04	79
99 Tc	7.31E-04	6
124 Sb	<5.6E-03	
125 Sb	<2.4E-01	
129 I	<2.6E-05	
131 I	<2.3E-02	
134 Cs	4.50E-01	5
137 Cs	1.00E+00	5
141 Ce	4.17E-02	5
144 Ce/Pr	1.30E+00	5
237 Np+242Pu	3.27E-05	7
238 Pu	5.64E-04	5
239, 240 Pu	1.11E-02	5
241 Pu	1.66E-01	5

Measured Concentration (uCi/gram)		
Nuclide	Value	% Uncer.
241-Am	2.17E-04	5
242-Cm	8.36E-04	5
243, 244-Cm	7.14E-05	5

Total TRU = 177.7 nCi/gm.

Total α TRU = 12.7 nCi/gm.

Total β^- TRU = 166 nCi/gm.

10/2/83
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RADIOACTIVE SAMPLE ANALYSIS

Plant Name : FARLEY Unit 1
 Sample Type : Resin
 Reference Date (mm-dd-yy) : 08-03-83
 Plant Sample ID : SAI#11 1A MIX BE
 SAI Sample # : 10238
 Analysis Reporting Date : 30-SEP-83
 Sample weight (gms) : 5.50

Measured Concentration (uCi/gram)		
Nuclide	Value	% Uncer.
3-H	8.77E-03	6
14-C	6.65E-02	5
51-Cr	<4.8E-01	
54-Mn	5.89E+00	5
58-Co	4.57E+01	5
59-Ni	6.17E-01	5
60-Co	7.39E+01	5
63-Ni	5.50E+01	5
65-Zn	<1.3E-01	
89-Sr	3.82E+00	5
90-Sr	3.02E+00	5
94-Nb	<3.2E-04	
95-Nb	<6.4E-02	
99-Tc	5.27E-03	5
110m-Ag	<8.3E-02	
124-Sb	<3.1E-02	
125-Sb	<4.6E-01	
129-I	2.2E-05	42
131-I	<1.5E-01	
134-Cs	2.15E+01	5
137-Cs	5.21E+01	5
141-Ce	2.43E-02	6
144-Ce/Pr	6.77E-01	5
237-Np+242Pu	1.2E-05	15
238-Pu	1.57E-04	5
239,240-Pu	2.99E-03	5
241-Pu	5.05E-02	5

Measured Concentration (uCi/gram)		
Nuclide	Value	% Uncer.
241-Am	1.22E-04	7
242-Cm	1.22E-04	7
243,244-Cm	6.1E-06	29

TOTAL TRU = 0.54 nCi/gm.
 TOTAL < TRU = 0.04 nCi/gm.
 TOTAL B⁻ TRU = 0.50 nCi/gm.

10/2/83
J. J. J.

Liquid Radwaste Analysis Program

Batch# 549

JK

EAST YARD DRAIN OUTFALL SEDIMENT

	Date	Time		Date	Time
Counting:	12-14-83	1509	Release :	12-14-83	1330
	Elapsed hours:-1.650E 00				

Detector # 1

Geometry: 11ia-0

Calibration coefficients

Energy	Efficiency
A0 : 3.2672E-01	Z1 : 6.5533E-02
A1 : 1.0003E 00	Z2 : -2.5735E 00
A2 : 0.0000E 00	Z3 : 3.5940E 02
A3 : 0.0000E 00	Z4 : 9.9403E-01
Date: 121483	Date: 91283

Parameters:

Peak sensitivity =	3.50
Max. # of channels in peak =	12
Peak termination fraction =	1.01
KeV slope for library match =	2.0

Sample volume: 1000.00 ml

Counting time: 2000seconds

Library being searched: LALIB3

Pk. #	Energy (KeV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	76.18	155	408	75.83	6	-
2	187.60	92	191	187.22	8	-
3	239.63	384	133	239.24	8	(Bka)
4	298.12	127	84	297.72	12	-
5	341.08	-3	173	340.67	13	-
6	502.65	18	7	502.20	3	-
7	512.28	60	27	511.83	10	Annih.
8	583.23	67	20	582.76	6	(Bka)
9	609.10	95	18	608.62	5	(Bka)
10	727.34	21	14	726.83	5	(Bka)
11	834.63	15	17	834.09	13	Mn-54
12	861.59	18	4	861.05	7	(Bka)
13	910.67	30	15	910.11	4	(Bka)
14	1120.20	22	12	1119.59	8	-
15	1275.65	8	7	1275.00	13	-
16	1460.04	77	1	1459.35	7	K-40
17	1763.37	12	3	1762.60	4	(Bka)

Quantitative Analysis

3

Isotope	Quantity	Std. Deviation	% Rel Error
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1	76.18	155	408	73.83	6	-
2	187.60	92	191	187.22	8	-
3	239.63	384	133	239.24	8	(Bkg)
4	298.12	127	84	297.72	12	-
5	341.08	-3	173	340.67	13	-
6	502.65	18	7	502.20	3	-
7	512.28	60	27	511.83	10	Annih.
8	583.23	67	20	582.76	6	(Bkg)
9	609.10	95	18	608.62	5	(Bkg)
10	727.34	21	14	726.83	5	(Bkg)
11	834.63	15	17	834.09	13	Mn-54
12	861.59	18	4	861.05	7	(Bkg)
13	910.67	30	15	910.11	4	(Bkg)
14	1120.20	22	12	1119.59	8	-
15	1275.65	8	7	1275.00	13	-
16	1460.04	77	1	1459.35	7	K-40
17	1763.37	12	3	1762.60	4	(Bkg)

Quantitative Analysis

Isotope	Quantity	Std. Deviation	% Rel Error
Mn-54	5.955E-08 uci/ml	3.386E-08 uci/ml	56.864
TOTAL	5.955E-08 uci/ml		

J. M. FARLEY NUCLEAR PLANT
LIQUID RADWASTE ANALYSIS

Date and time of release: 12-14-83 1330

* NEGATIVE SIGN MEANS LLD VALUE; NUCLIDE NOT DETECTED IN SPECTRUM

Nuclide	uCi/ml	C/MPC
Co-57	-5.22E-08	-0.000
Ce-144	-4.44E-07	-0.044
Tc-99M	-5.35E-08	-0.000
Ce-141	-9.68E-08	-0.001
Nb-239	-4.27E-07	-0.004
Cr-51	-4.66E-07	-0.000
I-131	-4.21E-08	-0.140
Ru-103	-3.82E-08	-0.000
I-133	-5.16E-08	-0.052
Ba-140	-1.71E-07	-0.009
As-76	-8.93E-08	-0.004
Cs-134	-6.06E-08	-0.007
Ru-106	-4.45E-07	-0.044
Cs-137	-6.40E-08	-0.003
Mo-99	-3.30E-07	-0.008
Zr-95	-9.91E-08	-0.002
Nb-95	-6.28E-08	-0.001
I-132	-1.13E-07	-0.014
Co-58	-7.16E-08	-0.001
Cs-136	-3.26E-08	-0.001
Mn-54	-3.95E-08	0.001
Ag-110M	-6.54E-08	-0.002
Sr-91	-2.09E-07	-0.004
Zn-65	-6.34E-08	-0.001
I-135	-1.94E-07	-0.048
Fe-59	-6.72E-08	-0.001
Co-60	-9.99E-08	-0.003
Cu-64	-1.34E-05	-0.085
Na-24	-3.34E-08	-0.001
La-140	-3.88E-08	-0.002
Sr-89	-1.88E-08	-0.006
Sr-90	-7.74E-09	-0.026
H-3	5.89E-02	19.633
P-32	0.00E-00	0.000
Fe-55	1.19E-08	0.000

CERTIFICATE OF RELEASE

This material meets the release requirements according to 10CFR-20 Table II Column 2.

 * RADIONUCLIDE ANALYSIS PROGRAM *

UNIT # 0
 RUN DESCRIPTION: EAST YARD DRAIN SEDIMENT

DATE TIME
 Sampling: 12-14-83 1330
 Counting: 12-14-83 1509

Elapsed hrs: 1.650E 00

Detector # 1

111a-0

CALIBRATION COEFFICIENTS

Energy/Channel	Efficiency/Energy
A0 : 3.2672E-01	Z1 : 6.5533E-02
A1 : 1.0003E 00	Z2 : -2.5735E 00
A2 : 0.0000E 00	Z3 : 3.5940E 02
A3 : 0.0000E 00	Z4 : 9.9403E-01
Date: 121483	Date: 91283

PEAK SEARCH PARAMETERS

S = 3.50 Peak Sensitivity
 M = 12 Max. # of channels in peak
 F = 1.01 Peak termination fraction
 R = 2.00 KeV slope for library match

LIBRARY:NAT

COUNTING TIME= 2000 SEC

SAMPLE VOLUME: 1.00E 03 ML

Pk. #	Energy (keV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
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1	76.18	155	408	75 02		
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PEAK SEARCH PARAMETERS

S = 3.50 Peak Sensitivity
M = 12 Max. # of channels in peak
F = 1.01 Peak termination fraction
R = 2.00 KeV slop for library match

LIBRARY:NAT

COUNTING TIME= 2000 SEC

SAMPLE VOLUME: 1.00E 03 ML

Pk #	Energy (keV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	76.18	155	408	75.83	6	-
2	187.60	92	191	187.22	8	Ra-226
3	239.63	384	133	239.24	8	Pb-212
4	298.12	127	84	297.72	12	-
5	341.08	-3	173	340.67	13	Ac-228
6	502.65	18	7	502.20	3	Ac-228
7	512.28	60	27	511.83	10	Tl-208
8	583.23	67	20	582.76	6	Tl-208
9	609.10	95	18	608.62	5	Bi-214
10	727.34	21	14	726.83	5	Ac-228
11	834.83	15	17	834.09	13	Ac-228
12	861.59	18	4	861.05	7	Tl-208

13	910.67	30	15	910.11	4	Ac-228
14	1120.20	22	12	1119.59	8	Bi-214
15	1275.65	8	7	1275.00	13	-
16	1460.04	77	1	1459.35	7	K-40
17	1763.37	12	3	1762.60	4	Bi-214

QUANTITATIVE ANALYSIS

ISOTOPE	QUANTITY	STD. DEVIATION	% REL ERROR
Ra-226	2.68E-06 uCi/ml	6.72E-07 uCi/ml	25.103
Tl-208	2.61E-03 uCi/ml	4.02E-02 uCi/ml	15.439
Ac-228	5.58E-07 uCi/ml	1.36E-07 uCi/ml	24.400
Bi-214	2.69E-05 uCi/ml	8.64E-06 uCi/ml	32.141
K-40	5.08E-06 uCi/ml	5.89E-07 uCi/ml	11.595
TOTAL	2.61E-03		

Liquid Radwaste Analysis Program

Preanalysis background

Batch# 549

BDS

BACKGROUND OF UNIT 2

Date	Time		Date	Time
Counting:	12-14-83	1400	Release :	12-14-83 1415
		Elapsed hours: 2.500E-01		

Detector # 1

Geometry: 111a-0

Calibration coefficients | Energy | Efficiency | |--------|------------| |--------|------------|

A0 : 3.2672E-01	Z1 : 6.5533E-02
A1 : 1.0003E 00	Z2 : -2.5735E 00
A2 : 0.0000E 00	Z3 : 3.5940E 02
A3 : 0.0000E 00	Z4 : 9.9403E-01
Date: 121483	Date: 91283

Parameters:

Peak sensitivity =	3.50
Max. # of channels in peak =	12
Peak termination fraction =	1.01
KeV slope for library match =	2.0

Sample volume: 1000.00 ml
Counting time: 1192seconds

Library being searched: LALIB3

Pk. #	Energy (KeV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	81.73	38	12	81.38	7	Xe-133

Quantitative Analysis

Isotope	Quantity	Std. Deviation	% Rel Error
Xe-133	1.690E-07 uci/ml	3.516E-08 uci/ml	20.806
TOTAL	1.690E-07 uci/ml		

J. M. FARLEY NUCLEAR PLANT
LIQUID RADWASTE ANALYSIS

Batch# 549 B05 BACKGROUND OF UNIT 2

Date and time of release: 12-14-83 1415

* NEGATIVE SIGN MEANS LLD VALUE; NUCLIDE NOT DETECTED IN SPECTRUM

Nuclide	uCi/ml	C/MPG
Co-57	-1.76E-08	-0.000
Ce-144	-1.18E-07	-0.012
Tc-99M	-1.03E-08	-0.000
Ce-141	-1.34E-08	-0.000
Np-239	-1.39E-07	-0.001
Cr-51	-1.77E-07	-0.000
I-131	-1.70E-08	-0.057
Ru-103	-2.13E-08	-0.000
I-133	-2.24E-08	-0.032
Ba-140	-6.60E-08	-0.004
As-76	-6.81E-08	-0.003
Cs-134	-2.33E-08	-0.003
Ru-106	-2.15E-07	-0.022
Cs-137	-4.21E-08	-0.002
Mo-99	-2.06E-07	-0.005
Zr-95	-5.26E-08	-0.001
Nb-95	-4.13E-08	-0.000
I-132	-4.17E-08	-0.005
Co-58	-3.10E-08	-0.000
Cs-136	-4.40E-08	-0.001
Mn-54	-3.17E-08	-0.000
Ag-110M	-4.48E-08	-0.001
Sr-91	-1.20E-07	-0.002
Zn-65	-8.08E-08	-0.001
I-135	-1.41E-07	-0.035
Fe-59	-1.13E-07	-0.002
Co-60	-5.05E-08	-0.002
Cu-64	-1.34E-05	-0.054
Na-24	-5.25E-08	-0.002
La-140	-6.36E-08	-0.003
Sr-89	1.98E-08	-0.006
Sr-90	-7.74E-09	-0.026
H-3	5.89E-02	19.633
P-32	0.00E 00	0.000
Fe-55	1.19E-08	0.000

----- Liquid Radwaste Analysis Program -----

Batch# 549

DEG

NRC DIRT SAMPLE SOUTH YARD DRAIN OUTFALL

	Date	Time		Date	Time
Counting:	12-14-83	1420	Release :	12-14-83	1500
	Elapsed hours: 6.667E-01				

Detector # 1

Geometry: 111a-0

Calibration coefficients Energy Efficiency

A0 : 3.2672E-01	Z1 : 6.5533E-02
A1 : 1.0003E 00	Z2 : -2.5735E 00
A2 : 0.0000E 00	Z3 : 3.5940E 02
A3 : 0.0000E 00	Z4 : 9.9403E-01
Date: 121483	Date: 91283

Parameters: -----

Peak sensitivity =	3.50
Max. # of channels in peak =	12
Peak termination fraction =	1.01
SeV slope for library match =	2.0

Sample volume: 1000.00 ml
Counting time: 2000seconds

Library being searched: LALIB3

Pk. #	Energy (KeV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	76.11	272	420	75.76	6	-
2	186.35	94	171	185.98	5	-
3	239.58	469	165	239.19	8	(Bke)
4	270.99	44	64	270.59	4	-
5	295.56	106	81	295.16	5	(Bke)
6	341.03	119	110	340.62	12	-
7	352.41	178	41	351.99	4	(Bke)
8	511.04	55	27	510.59	6	Annih.
9	583.21	98	25	582.73	5	(Bke)
10	610.00	163	29	609.52	11	(Bke)
11	727.19	23	11	726.68	4	(Bke)
12	910.90	70	13	910.34	5	(Bke)
13	963.89	6	13	963.32	3	-
14	1119.70	28	5	1119.09	5	-

15	1281.01	10	2	1280.36	3	-
16	1459.82	52	3	1459.13	6	K-40
17	1763.14	18	4	1762.36	5	(Bke)
18	1847.95	9	4	1847.15	13	-

Quantitative Analysis

Isotope	Quantity	Std. Deviation	% Rel Error
TOTAL	0.000E 00 uci/ml		

J. M. FARLEY NUCLEAR PLANT LIQUID RADWASTE ANALYSIS

Batch# .549 DSC NRC DIRT SAMPLE SOUTH YARD DRAIN OUTFALL

Date and time of release: 12-14-83 1500

* NEGATIVE SIGN MEANS LLD VALUE; NUCLIDE NOT DETECTED IN SPECTRUM

Nuclide	uCi/ml	C/MPG
Co-57	-6.42E-08	-0.000
Ce-144	-1.57E-07	-0.052
Tc-99M	-6.17E-08	-0.000
Ce-141	-1.16E-07	-0.001
Np-239	-4.80E-07	-0.005
Cr-51	-2.58E-07	-0.000
I-131	-5.38E-08	-0.179
Ru-103	-5.40E-08	-0.001
I-133	-6.64E-08	-0.066
Ba-140	-1.71E-07	-0.009
As-76	-1.09E-07	-0.005
Cs-134	-5.20E-08	-0.006
Ru-106	-4.45E-07	-0.044
Cs-137	-8.33E-08	-0.004
Mo-99	-3.90E-07	-0.010
Zr-95	-1.13E-07	-0.002
Nb-95	-5.51E-08	-0.001
I-132	-1.19E-07	-0.015
Co-58	-5.23E-08	-0.001
Cs-136	-6.95E-08	-0.001
Mn-54	-5.01E-08	-0.001
Ag-110M	-8.01E-08	-0.003
Sr-91	-1.65E-07	-0.003
Zn-65	-9.63E-08	-0.001
P-135	-2.47E-07	-0.062
Fe-59	-9.49E-08	-0.002
Co-60	-7.97E-08	-0.003
Cu-64	-1.34E-05	-0.066
Na-24	-6.38E-08	-0.002
La-140	-8.54E-08	-0.004

 * RADIONUCLIDE ANALYSIS PROGRAM *

UNIT # 1

RUN DESCRIPTION: NRC DIRT SOUTH YARD DRAIN OUTFALL

	DATE	TIME
Sampling:	12-14-83	1330
Counting:	12-14-83	1420

Elapsed hrs: 8.333E-01

Detector # 1

111a-0

CALIBRATION COEFFICIENTS

Energy/Channel	Efficiency/Energy
A0 : 3.2672E-01	Z1 : 6.5533E-02
A1 : 1.0003E 00	Z2 : -2.5735E 00
A2 : 0.0000E 00	Z3 : 3.5940E 02
A3 : 0.0000E 00	Z4 : 9.9403E-01
Date: 121483	Date: 91283

PEAK SEARCH PARAMETERS

S = 3.50 Peak Sensitivity
 M = 12 Max. # of channels in peak
 F = 1.01 Peak termination fraction
 R = 2.00 KeV slope for library match

LIBRARY:NAT

COUNTING TIME= 2000 SEC

SAMPLE VOLUME: 1.00E 03 ML

Pk. #	Energy (keV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	76.11	272	420	75.76	6	-
2	186.35	94	171	185.98	5	Ra-226
3	239.58	469	165	239.19	8	Pb-212
4	270.99	44	64	270.59	4	Ac-228
5	295.56	106	81	295.16	5	Pb-214
6	341.03	119	110	340.62	12	Ac-228
7	352.41	178	41	351.99	4	Pb-214
8	511.04	55	27	510.59	6	Ac-228
9	583.21	98	25	582.73	5	Tl-208
10	610.00	163	29	609.52	11	Bi-214
11	727.19	23	11	726.68	4	Ac-228
12	910.90	70	13	910.34	5	Ac-228
13	963.89	6	13	963.32	3	Bi-214
14	1119.70	28	5	1119.09	5	Bi-214
15	1281.01	10	2	1280.36	3	Bi-214
16	1459.82	52	3	1459.13	6	K-40
17	1763.14	18	4	1762.36	5	Bi-214
18	1847.95	9	4	1847.15	13	Bi-214

QUANTITATIVE ANALYSIS

ISOTOPE	QUANTITY	STD. DEVIATION	% REL ERROR
Ra-226	2.72E-06 uCi/ml	5.82E-07 uCi/ml	21.433
Pb-214	3.21E-06 uCi/ml	2.84E-07 uCi/ml	8.838
Tl-208	5.66E-02 uCi/ml	8.15E-03 uCi/ml	12.238
Ac-228	1.17E-06 uCi/ml	1.61E-07 uCi/ml	13.832
Bi-214	5.10E-06 uCi/ml	1.33E-06 uCi/ml	21.773
K-40	3.44E-06 uCi/ml	5.04E-07 uCi/ml	14.646
TOTAL	5.66E-02		

Liquid Radwaste Analysis Program

Batch# 549

WASTE SETTLING POND

	Date	Time		Date	Time
Counting:	12-14-83	1509	Release :	12-14-83	1555
	Elapsed hours: 7.667E-01				

Detector: # 1

Geometry: 11ia-0

Calibration coefficients

Energy	Efficiency
A0 : 3.2672E-01	Z1 : 6.5533E-02
A1 : 1.0003E 00	Z2 : -2.5735E 00
A2 : 0.0000E 00	Z3 : 3.5940E 02
A3 : 0.0000E 00	Z4 : 9.9403E-01
Date: 121483	Date: 91283

Parameters:

Peak sensitivity =	3.50
Max. # of channels in peak =	12
Peak termination fraction =	1.01
GeV slope for library match =	2.0

Sample volume: 1000.00 ml
Counting time: 2000seconds

Library being searched: LALIB3

PK. #	Energy (KeV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	68.55	-343	1187	68.20	13	-
2	239.41	583	173	239.02	7	(Bke)
3	270.60	56	56	270.21	5	-
4	295.46	50	60	295.05	4	(Bke)
5	338.44	49	52	338.03	4	(Bke)
6	352.05	160	51	351.64	5	(Bke)
7	511.77	45	31	511.32	6	Annih.
8	583.24	140	20	582.77	5	(Bke)
9	609.30	111	10	608.82	6	(Bke)
10	730.02	50	15	729.51	13	-
11	795.01	20	7	794.48	4	(BKG)
12	911.08	79	9	910.52	6	(Bke)
13	968.72	38	11	968.15	3	(Bke)
14	1031.06	4	15	1030.47	13	-
15	1120.11	10	4	1119.50	5	-
16	1460.65	45	0	1459.96	13	K-40
17	1764.59	7	4	1763.82	13	(Bke)

Quantitative Analysis

Isotope	Quantity	Std. Deviation	% Rel Error
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Batch# 549

Jab

WASTE SETTLING POND

Date and time of release: 12-14-83 1555

* NEGATIVE SIGN MEANS LLD VALUE; NUCLIDE NOT DETECTED IN SPECTRUM

Nuclide	uCi/ml	C/MPC
Co-57	-5.77E-08	-0.000
Ce-144	-4.76E-07	-0.048
Tc-99M	-6.04E-08	-0.000
Ce-141	-9.93E-08	-0.001
Np-239	-4.98E-07	-0.005
Cr-51	-4.77E-07	-0.000
I-131	-5.57E-08	-0.186
Ru-103	-5.09E-08	-0.001
I-133	-6.06E-08	-0.061
Ba-140	-1.93E-07	-0.010
As-76	-1.09E-07	-0.005
Cs-134	-5.20E-08	-0.006
Ru-106	-4.97E-07	-0.050
Cs-137	-6.70E-08	-0.004
Mo-99	-3.70E-07	-0.009
Zr-95	-9.91E-08	-0.002
Nb-95	-7.39E-08	-0.001
I-132	-6.19E-08	-0.010
Co-58	-5.55E-08	-0.001
Cs-136	-5.57E-08	-0.001
Mn-54	-6.55E-08	-0.001
Ag-110M	-5.97E-08	-0.002
Sr-91	-7.42E-08	-0.001
Zn-65	-6.81E-08	-0.001
I-135	-1.25E-07	-0.031
Fe-59	-1.16E-07	-0.002
Co-60	-6.73E-08	-0.002
Cu-64	-1.34E-05	-0.066
Na-24	-4.53E-08	-0.002
La-140	-6.55E-08	-0.004
Sr-89	-1.88E-08	-0.006
Sr-90	-7.74E-09	-0.026
H-3	5.99E-02	19.633
P-32	0.00E 00	0.000
Fe-55	1.19E-08	0.000

CERTIFICATE OF RELEASE

This material meets the release requirements according to 10CFR-20 Table II Column 2.

 * RADIONUCLIDE ANALYSIS PROGRAM *

UNIT # 1
 RUN DESCRIPTION: WASTE SETTLING POND
 INLET (POINT # 1)

DATE TIME
 Sampling: 12-14-83 1310
 Counting: 12-14-83 1509

Elapsed hrs: 1.983E 00

Detector # 1

111a-0

CALIBRATION COEFFICIENTS

Energy/Channel	Efficiency/Energy
A0 : 3.2672E-01	Z1 : 6.5533E-02
A1 : 1.0003E 00	Z2 : -2.5735E 00
A2 : 0.0000E 00	Z3 : 3.5940E 02
A3 : 0.0000E 00	Z4 : 9.9403E-01
Date: 121483	Date: 91283

PEAK SEARCH PARAMETERS

S = 3.50 Peak Sensitivity
 M = 12 Max. # of channels in peak
 F = 1.01 Peak termination fraction
 R = 2.00 KeV slope for library match

LIBRARY:NAT

COUNTING TIME= 2000 SEC

SAMPLE VOLUME: 1.00E 03 ML

Pk. #	Energy (keV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	68.55	-343	1187	68.20	13	-
2	239.41	583	173	239.02	7	Pb-212

13	968.72	38	11	968.15	3	Ac-228
14	1031.06	4	15	1030.47	13	-
15	1120.11	18	4	1119.50	5	Bi-214
16	1460.65	45	0	1459.96	13	K-40
17	1764.59	7	4	1763.82	13	Bi-214

QUANTITATIVE ANALYSIS

ISOTOPE	QUANTITY	STD. DEVIATION	% REL ERROR
Pb-214	1.72E-05 uCi/ml	1.71E-06 uCi/ml	9.938
Tl-208	4.77E-05 uCi/ml	4.52E-04 uCi/ml	9.494
Ac-228	1.51E-06 uCi/ml	1.88E-07 uCi/ml	12.467
Bi-214	4.40E-05 uCi/ml	1.25E-05 uCi/ml	28.301
K-40	2.98E-06 uCi/ml	4.44E-07 uCi/ml	14.907
TOTAL	4.77E-05		

As-76	-1.09E-07	-0.005
Cs-134	-5.20E-08	-0.006
Ru-106	-4.97E-07	-0.050
Cs-137	-0.70E-08	-0.004

Liquid Radwaste Analysis Program

Batch# 550

Job

NORTH YARD DRAIN OUTFALL

Date	Time	Date	Time
Counting: 12-14-83	1745	Release: 12-14-83	2100
Elapsed hours: 3.250E 00			

Detector # 1

Geometry: 1114-0

Calibration coefficients

Energy	Efficiency
A0 : 3.2672E-01	Z1 : 6.5533E-02
A1 : 1.0003E 00	Z2 : -2.5735E 00
A2 : 0.0000E 00	Z3 : 3.5940E 02
A3 : 0.0000E 00	Z4 : 9.9403E-01
Date: 121483	Date: 91283

Parameters:

Peak sensitivity =	3.50
Max. # of channels in peak =	12
Peak termination fraction =	1.01
GeV slope for library match =	2.0

Sample volume: 1000.00 ml
Counting time: 2000seconds

Library being searched: LALIB3

Pk. #	Energy (keV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	78.72	180	472	78.37	13	-
2	239.75	226	99	239.36	9	(Bkg)
3	295.52	47	48	295.12	5	(Bkg)
4	338.53	37	25	338.11	5	(Bkg)
5	352.18	105	21	351.76	6	(Bkg)
6	511.23	36	13	510.77	5	Annih.
7	583.19	64	13	582.71	7	(Bkg)
8	609.53	50	8	609.05	5	(Bkg)
9	862.91	5	7	862.36	13	-
10	910.76	43	8	910.20	5	(Bkg)
11	1402.90	0	9	1402.22	13	-
12	1459.57	16	0	1458.88	13	K-40
13	1763.34	7	0	1762.57	13	(Bkg)

Quantitative Analysis

Isotope	Quantity	Std. Deviation	% Rel Error
<hr/>			
TOTAL	0.000E 00 uci/ml		

* NEGATIVE SIGN MEANS LLD VALUE; NUCLIDE NOT DETECTED IN SPECTRUM

Nuclide	uCi/ml	C/MPG
Co-57	-4.53E-08	-0.000
Ce-144	-3.78E-07	-0.038
Tc-99M	-4.35E-03	-0.000
Ce-141	-8.30E-08	-0.001
Np-239	-4.27E-07	-0.004
Cr-51	-3.42E-07	-0.000
I-131	-8.03E-08	-0.168
Ru-103	-4.23E-08	-0.001
I-133	-4.78E-08	-0.048
Ba-140	-1.79E-07	-0.009
As-76	-6.78E-08	-0.004
Cs-134	-3.68E-08	-0.004
Ru-106	-2.87E-07	-0.029
Cs-137	-6.64E-08	-0.003
Mo-99	-2.53E-07	-0.006
Zr-95	-7.68E-08	-0.001
Nb-95	-5.24E-08	-0.001
I-132	-1.48E-07	-0.019
Co-58	-3.20E-08	-0.000
Cs-136	-4.57E-08	-0.001
Mn-54	-5.01E-08	-0.001
Ag-110M	-5.34E-08	-0.002
Sr-91	-1.25E-07	-0.003
Zn-65	-6.81E-08	-0.001
I-135	-1.14E-07	-0.029
Fe-59	-1.16E-07	-0.002
Co-60	-4.26E-08	-0.001
Cu-64	-1.34E-05	-0.076
Na-24	-3.59E-08	-0.001
La-140	-0.99E-08	-0.002
Sr-89	-1.88E-08	-0.006
Sr-90	-7.74E-09	-0.026
H-3	5.89E-02	19.633
P-32	0.00E-00	0.000
Fe-55	1.19E-08	0.000

CERTIFICATE OF RELEASE

This material meets the release requirements according to 10CFR-20 Table II Column 2.

 * RADIONUCLIDE ANALYSIS PROGRAM *

UNIT # 1
 RUN DESCRIPTION: NORTH YARD DRAIN OUTFALL

	DATE	TIME
Sampling:	12-14-83	1340
Counting:	12-14-83	1745

Elapsed hrs: 4.083E 00

Detector # 1

111a-0

CALIBRATION COEFFICIENTS

Energy/Channel	Efficiency/Energy
A0 : 3.2672E-01	Z1 : 6.5533E-02
A1 : 1.0003E 00	Z2 : -2.5735E 00
A2 : 0.0000E 00	Z3 : 3.5940E 02
A3 : 0.0000E 00	Z4 : 9.9403E-01
Date: 121483	Date: 91283

PEAK SEARCH PARAMETERS

S = 3.50 Peak Sensitivity
 M = 12 Max. # of channels in peak
 F = 1.01 Peak termination fraction
 R = 2.00 KeV slope for library match

LIBRARY:NAT

COUNTING TIME= 2000 SEC

SAMPLE VOLUME: 1.00E 03 ML

Pk. #	Energy (keV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
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1	28.72	180	472	78 27	12	
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COUNT 1
SAMPLE VOLUME: 1.00E 03 ML

Pk. #	Energy (keV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	78.72	180	472	78.37	13	-
2	239.75	226	99	239.36	9	Pb-212
3	295.52	47	48	295.12	5	Pb-214
4	338.53	37	25	338.11	5	Ac-228
5	352.18	105	21	351.76	6	Pb-214
6	511.23	36	13	510.77	5	Tl-208
7	583.19	64	13	582.71	7	Tl-208
8	609.53	50	8	609.05	5	Bi-214
9	862.91	5	7	862.36	13	-
10	910.76	43	8	910.20	5	Ac-228
11	1402.90	0	9	1402.22	13	Bi-214
12	1459.57	16	0	1458.88	13	K-40
13	1763.34	7	0	1762.57	13	Bi-214

QUANTITATIVE ANALYSIS

ISOTOPE	QUANTITY	STD. DEVIATION	% REL ERROR
Pb-214	2.94E-04 uCi/ml	3.39E-05 uCi/ml	11.547
Tl-208	3.75E-17 uCi/ml	5.60E-16 uCi/ml	14.946
Ac-228	1.03E-06 uCi/ml	1.82E-07 uCi/ml	17.647
K-40	1.06E-06 uCi/ml	2.64E-07 uCi/ml	25.000
TOTAL	3.75E-17		

 * RADIOISOTOPE ANALYSIS PROGRAM *

UNIT # 1
 RUN DESCRIPTION: GPP VENIN INLET
 JCS

DATE TIME

 Starling: 2 -1-83 407
 Column: 2 -1-83 457

Elapsed hrs: 8.033E-01

Detector # 3

disk-0

CALIBRATION COEFFICIENTS

Energy/Channel	Efficiency/Energy
R0 : 1.677E-01	21 : 7.6399E-05
R1 : 1.6003E-00	22 : 9.3757E-00
R2 : 9.0000E-00	23 : 6.2090E-01
R3 : 8.0000E-00	24 : 1.0495E-00
Date: 25132	Date: 23132

PARAMETER PARAMETERS

S = 2.38 Peak Sensitivity
 R = 12 Ch. # of Channels on Peak
 P = 0.51 Peak termination fraction
 K = 1.00 App. slope for library match

COMPUTED DATA 1000 SEC

ANALYSE VOLUME 1.00E 00 ML

PL	Energy	Area	Count	Address	Chn	Isotope
#	X-ray	Count	Count	Channel	Chan.	Name
1	91.13	103	182	90.99	7	-
2	102.6	958	354	102.27	14	-
3	119.51	82	308	119.31	10	-
4	133.75	184	464	133.85	4	Co-144
5	140.32	165	173	140.61	4	-
6	145.72	649	184	145.51	3	-
7	228.47	128	116	228.24	3	Fe-133
8	277.58	39	79	277.34	3	Ni-239
9	321.12	58	118	320.67	3	Cr-51
10	347.13	63	69	346.88	4	Co-140
11	447.84	95	92	447.56	6	-
12	511.46	389	132	511.15	9	Annih
13	535.32	173	178	535.01	13	-
14	563.75	104	73	563.46	7	I-132
15	725.53	66	35	725.16	8	Zr-95
16	757.63	17	22	756.65	4	Zr-95
17	765.90	116	28	765.82	5	Nb-95
18	773.42	90	25	773.04	6	Te-131M
19	911.34	1171	31	911.85	18	Co-58
20	967.68	3	28	967.27	13	-
21	1173.30	231	20	1172.81	8	Co-60
22	1311.31	2	11	1311.39	11	-
23	1352.44	196	8	1351.91	8	Co-60
24	1595.32	32	2	1595.12	5	Co-140

QUANTITATIVE ANALYSIS

ISOTOPE	QUANTITY	ST. DEVIATION	% REL. ERROR
Fe-133	3.10E-04 uCi/ml	1.62E-05 uCi/ml	17.939
Fe-132	5.37E-05 uCi/ml	7.14E-06 uCi/ml	14.395
Ni-239	1.89E-04 uCi/ml	1.28E-05 uCi/ml	22.581
Cr-51	2.94E-04 uCi/ml	1.08E-05 uCi/ml	29.175
Zr-95	1.39E-04 uCi/ml	1.08E-05 uCi/ml	19.462
Nb-95	1.50E-04 uCi/ml	1.44E-05 uCi/ml	11.808
Te-131M	2.80E-04 uCi/ml	1.44E-05 uCi/ml	12.858
Co-58	1.64E-03 uCi/ml	1.08E-05 uCi/ml	3.897
Co-60	4.37E-04 uCi/ml	1.08E-05 uCi/ml	7.554
Co-140	9.53E-05 uCi/ml	1.08E-05 uCi/ml	18.339
TOTAL	3.54E-03		

 RADIONUCLIDE ANALYSIS PROGRAM *

UNIT # 1
 RUN DESCRIPTION: U-1 SFP DEMIN. INLET ISOTOPIC
 BGH

	DATE	TIME
Sampling:	1-30-83	2107
Counting:	1-30-83	2152

Elapsed hrs: 7.500E-01

Detector # 1

 disk-0

CALIBRATION COEFFICIENTS

Energy/Channel	Efficiency/Energy
A0 : 2.4716E-01	Z1 : 8.4080E-01
A1 : 1.0000E 00	Z2 : -1.0954E 00
A2 : 0.0000E 00	Z3 : 7.9980E 01
A3 : 0.0000E 00	Z4 : 1.3033E 00
Date: 13083	Date: 52982

 PEAK SEARCH PARAMETERS

S =	3.50	Peak Sensitivity
M =	12	Max. # of channels in peak
F =	1.01	Peak termination fraction
R =	2.00	KeV slope for library match

H = 1 No. # of channels in peak
 F = 1.01 Peak termination fraction
 R = 2.00 KeV slope for library match

LIBRARY:wext

COUNTING TIME= 1000 SEC

SAMPLE VOLUME: 1.00E 00 ML

Pk. #	Energy (kev)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	95.28	-70	789	95.03	13	-
2	116.84	76	139	116.59	4	-
3	133.12	98	108	132.87	4	Ce-144
4	140.47	-161	403	140.22	5	-
5	228.39	151	107	228.14	5	Te-132
6	280.18	130	192	279.93	12	-
7	364.43	40	35	364.17	3	I-131
8	487.05	46	52	486.80	4	La-140
9	497.80	132	90	497.55	7	-
10	511.22	168	112	510.97	7	Annih
11	668.75	85	39	668.49	8	I-132
12	725.07	69	41	724.81	8	Zr-95
13	756.84	72	23	756.58	5	Zr-95
14	767.90	265	36	767.64	12	Bi-214
15	810.96	682	36	810.70	7	Co-58
16	834.67	13	9	834.41	3	Mn-54
17	1173.31	136	8	1173.05	6	Co-60
18	1332.75	149	7	1332.48	13	Co-60
19	1596.03	33	0	1595.76	13	La-140

QUANTITATIVE ANALYSIS

ISOTOPE	QUANTITY	STD. DEVIATION	% REL ERROR
Ce-144	3.29E-04 uCi/ml	5.60E-05 uCi/ml	17.014
Te-132	7.43E-05 uCi/ml	9.14E-06 uCi/ml	12.307
I-131	3.16E-05 uCi/ml	7.59E-06 uCi/ml	24.044
Zr-95	2.01E-04 uCi/ml	3.00E-05 uCi/ml	14.927
Co-58	1.15E-03 uCi/ml	4.64E-05 uCi/ml	4.044
Mn-54	2.26E-05 uCi/ml	8.94E-06 uCi/ml	39.599
Co-60	4.65E-04 uCi/ml	4.11E-05 uCi/ml	8.756
La-140	1.39E-04 uCi/ml	2.43E-05 uCi/ml	17.408
TOTAL	2.42E-03		

 * RADIONUCLIDE ANALYSIS PROGRAM *

UNIT # 1
 RUN DESCRIPTION: U-1 SFP DEMIN. OUTLET ISOTOPIC
 BGA

 DATE TIME

 Sample: 1-30-83 2117
 Count: 1-30-83 2202

Elapsed hrs: 7.500E-01

Detector # 2

 disk-0

CALIBRATION COEFFICIENTS

Energy/Channel	Efficiency/Energy
A0 : 3.7202E-01	Z1 : 7.6398E-05
A1 : 1.0002E 00	Z2 : -5.3757E 00
A2 : 0.0000E 00	Z3 : 6.2896E 01
A3 : 0.0000E 00	Z4 : 1.0495E 00
Date: 13083	Date: 53182

 PEAK SEARCH PARAMETERS

S = 3.50 Peak Sensitivity
 M = 12 Max. # of channels in peak
 F = 1.01 Peak termination fraction
 R = 2.00 KeV slope for library match

LIBRARY: wect

COUNTING TIME= 1000 SEC

SAMPLE VOLUME: 1.00E 00 ML

Pk. #	Energy (kev)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	228.62	53	9	228.19	4	Te-132
2	511.60	12	5	511.12	6	Annih
3	627.31	10	0	626.80	13	W-187
4	768.81	23	0	768.26	13	Bi-214
5	810.72	16	3	810.17	3	Co-58
6	1173.44	10	0	1172.80	13	Co-60

QUANTITATIVE ANALYSIS

ISOTOPE	QUANTITY	STD. DEVIATION	% REL ERROR
Te-132	2.21E-05 uCi/ml	3.46E-06 uCi/ml	15.683
Co-58	2.13E-05 uCi/ml	6.02E-06 uCi/ml	28.306
TOTAL	4.33E-05		

PEAK SEARCH PARAMETERS

S = 3.50 Peak Sensitivity
M = 12 Max. # of channels in peak
F = 1.01 Peak termination fraction
R = 2.00 KeV slope for library match

LIBRARY: wect

COUNTING TIME= 1000 SEC

SAMPLE VOLUME: 1.00E 00 ML

Pk. #	Energy (kev)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	1332.27	8	2	1331.60	13	Co-60



J. M. FARLEY NUCLEAR PLANT
GROSS BETA-GAMMA ANALYSIS
CR-IPC-006

UNIT # 1
BGH
SFP DEMIN. OUTLET

* NOTE: Negative Sign Indicates Value Less Than LLD

Counting time 1 minutes
Date and time of sample: 1-30-83 2117
Date and time of count: 1-30-83 2202

TOTAL COUNTS	=	291.00
COUNT TIME (min.)	/	1.00
GROSS COUNT RATE (CPM)	=	291.00
BACKGROUND (CPM)	-	18.00
NET COUNT RATE (CPM)	=	273.00
SYSTEM EFFICIENCY	/	0.474
DISINTEGRATION RATE (DPM)	=	576.07
DPM/UCURIE (2.22E6 DPM/UCI)	/	2.22E-06
UCURIE CONTENT	=	2.59E-04
SAMPLE VOLUME (ml)	/	1.0000
LLD (uCi/ml)	=	1.88E-05

* NET UNIT VOLUME (uCi/ml) = 2.5949E-04

J. M. FARLEY NUCLEAR PLANT
GROSS BETA-GAMMA ANALYSIS
CR-IPC-006

UNIT # 1
BGH
SFP DEMIN. INLET

* NOTE: Negative Sign Indicates Value Less Than LLD

Counting time 1 minutes
Date and time of sample: 1-30-83 2107
Date and time of count: 1-30-83 2152

TOTAL COUNTS	=	7746.00
COUNT TIME (min.)	/	1.00
GROSS COUNT RATE (CPM)	=	7746.00
BACKGROUND (CPM)	=	18.00
NET COUNT RATE (CPM)	=	7728.00
SYSTEM EFFICIENCY	/	0.474
DISINTEGRATION RATE (DPM)	=	16307.24
DPM/μCURIE (2.22E6 DPM/μCi)	/	2.22E 06
μCURIE CONTENT	=	7.35E-03
SAMPLE VOLUME (ml)	/	1.0000
LLD (μCi/ml)	=	1.88E-05
UNIT VOLUME (μCi/ml)	=	7.3456E-03

 * RADIOISOTOPE ANALYSIS PROGRAM *

UNIT # 1
 RUN DESCRIPTION: SFP DEMIN INLET
 JCS

DATE TIME

 Sampling: 1-30-83 10
 Counting: 1-30-83 55

Elapsed time: 7.530E-01

Detector # 1

disk-0

CALIBRATION COEFFICIENTS

Energy/Channel	Efficiency/Energy
A0 : 3.9389E-01	Z1 : 8.4088E-01
A1 : 3.9544E-01	Z2 : 1.0954E 00
A2 : 3.0000E 00	Z3 : 7.9988E 01
A3 : 4.0000E 00	Z4 : 1.3030E 00
Date: 1983	Date: 52382

END SEARCH PARAMETERS

1.00 Peak Sensitivity
 1.00 % of channels in peak
 1.00 Peak elimination fraction
 2.00 Delay time for library match

COUN INC TIME= 1000 SEC

SAMPLE VOLUME: 1.00E 00 ml

#	Energy (keV)	Net Count	Baseline Count	Address Channel	In. an.	Isotopes Name
1	91.19	159	142	91.96	4	-
2	101.64	831	215	103.52	1	-
3	116.84	150	178	116.52	1	-
4	134.00	51	112	134.19	6	Ce-144
5	145.50	71	102	145.19	4	-
6	197.16	24	90	196.59	2	Cr-98
7	210.39	30	67	216.13	3	-
8	238.50	2	81	238.02	3	Te-132
9	277.83	153	53	277.56	6	Nb-93
10	447.26	137	38	447.23	5	-
11	511.61	133	56	511.51	6	Annin
12	714.51	130	14	714.03	3	I-131
13	777.41	81	15	777.14	2	Cr-95
14	786.83	46	19	786.01	6	Nb-95
15	811.33	167	49	811.32	4	Co-57
16	884.16	30	13	884.23	3	I-131
17	1123.41	105	7	1123.63	2	Co-60
18	1322.57	140	2	1322.75	2	Co-60

QUANTITATIVE ANALYSIS

ISOTOPE	ACTIVITY	STD. DEVIATION	PERCENT
144	1.1E-04	1.57E-05	14.3
132	1.7E-05	1.58E-06	9.3
144	5.13E-04	1.92E-05	3.7
131	1.71E-03	1.64E-05	1.0
98	1.25E-03	1.64E-05	1.3
95	6.13E-04	1.46E-05	2.4
57	1.43E-04	1.26E-05	8.9
60	3.16E-04	1.13E-05	3.5
95	2.41E-04		

J. N. FARLEY NUCLEAR PLANT
GROSS BETA-GAMMA ANALYSIS
CR-IPC-006

UNIT # 1
DCH
ISFF DEMIN. BG INLET

A NOTE: Negative Sign Indicates Value Less Than LLD

Counting time 1 minutes
Date and time of sample 1-30-83 10
Date and time of count 1-30-83 55

TOTAL COUNTS	=	4996.64
COUNT TIME (min.)	/	1.00
GROSS COUNT RATE (CPM)	=	4996.60
BACKGROUND (CPM)	=	16.48
NET COUNT RATE (CPM)	=	4979.60
SYSTEM EFFICIENCY	/	0.474
DISINTEGRATION RATE (DPM)	=	10587.70
DPM/UCURIE (2.22E6 DPM/UCI)	/	2.22E-06
UCURIE CONTENT	=	4.73E-03
SAMPLE VOLUME (ml)	/	1.0000
LLD (UCI/ml)	=	1.79E-05

ACTIVITY/UNIT VOLUME (UCI/ml)	=	4.7312E-03
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J. W. FARLEY NUCLEAR PLANT
GROSS BETA-GAMMA ANALYSIS
CR-IPC-006

WELL # 1

WCH

OFF DEMIN. BG OUTLET

NOTE: Negative Sign Indicates Value Less Than LLD

Counting time 1 minutes
Date and time of sample: 1-29-83 2339
Date and time of count: 1-30-83 24

TOTAL COUNTS	=	878.00
COUNT TIME (min.)	/	1.00
GROSS COUNT RATE (CPM)	=	878.00
BACKGROUND (CPM)	=	16.40
NET COUNT RATE (CPM)	=	861.60
SYSTEM EFFICIENCY	/	0.474
DISINTEGRATION RATE (DPM)	=	1819.11
CPM/UCURIE (2.22E6 DPM/UCI)	/	2.22E-06
ACTIVITY CONTENT	=	8.19E-04
SAMPLE VOLUME (L)	/	1.0000
LLD (UCI/WI)	=	1.79E-05
ACTIVITY/UNIT VOLUME (UCI/WI)	=	8.1897E-04

 * RADIONUCLIDE ANALYSIS PROGRAM *

UNIT # 1
 RUN DESCRIPTION: ISPT DENIN. OUTLET
 DATE: 1-29-83

DATE TIME

 Sampled: 1-29-83 1139

DATE TIME

 Sampled: 1-29-83 2339
 Counted: 1-30-83 06

Elapsed hrs: 7.833E-01

Detector # 1

Model: 0

CALIBRATION COEFFICIENTS

Energy/Channel	Efficiency/Energy
00 : 2.3369E-01	21 : 8.1800E-01
01 : 9.9944E-01	22 : 1.0954E-00
02 : 0.0000E-00	23 : 7.9900E-01
03 : 0.0000E-00	24 : 1.0000E-00
Date: 12983	Date: 52932

PEAK SEARCH PARAMETERS

SAMPLE VOLUME: 1.00E 00 ML

#	Energy (keV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	92.01	52	21	91.68	4	-
2	145.77	74	23	145.47	5	-
3	228.78	20	9	228.50	3	Fe-132
4	498.85	49	11	497.94	9	-
5	511.53	34	12	511.43	6	Annih
6	763.56	35	9	763.00	13	-
7	811.35	92	6	811.15	7	Co-53
8	1173.38	14	1	1173.37	4	Co-60

QUANTITATIVE ANALYSIS

ISOTOPE	QUANTITY	STD. DEVIATION	% REL ERROR
Fe-132	1.30E-05 uCi/ml	2.68E-06 uCi/ml	20.664
Co-53	1.24E-04 uCi/ml	1.38E-05 uCi/ml	11.108
TOTAL	1.37E-04		

PEAK SEARCH PARAMETERS

C = 3.75 Peak Sensitivity
 R = 12 Max. # of channels in peak
 F = 1.01 Peak termination fraction
 S = 2.00 KeV slow for library match

LIBRARY SELECT

COUNTING TIME: 1253 SEC

SAMPLE VOLUME: 1.00E 00 ML

#	Energy (keV)	Net Count	Baseline Count	Address Channel	No. Chan.	Isotope Name
1	1332.39	7	1	1332.75	4	Co-60

QUANTITATIVE ANALYSIS

ISOTOPE	QUANTITY	STD. DEVIATION	% REL ERROR
Fe-132	1.30E-05 uCi/ml	2.68E-06 uCi/ml	20.664
Co-53	1.24E-04 uCi/ml	1.38E-05 uCi/ml	11.108
Co-60	1.81E-06 uCi/ml	7.09E-06 uCi/ml	40.914
TOTAL	1.55E-04		

JOSEPH M. FARLEY NUCLEAR PLANT
NUCLEAR GENERATION
MEMORANDUM

Subject: Alpha Contamination
FNP-83-0323

Date: March 21, 1983

To: M. W. Mitchell

From: W. G. Griepentog

During the Unit One outage on January 31, February 1, and February 2, 1983, smears were obtained from the spent fuel handling tool, spent fuel bridge crane and general area of the spent fuel pool. Air samples were also obtained from these general areas.

Examination by Health Physics Personnel revealed alpha activity. The instruments used to examine the same included a Low Background Counter and Alpha Scintillation counters.

Counting Room/Environmental Personnel utilized an Alpha Spectrometer to qualitatively analyze the same samples. The results of the analysis indicated the smears contained U-238 and isotopes of Thorium and their daughter decay products. The air samples contained only isotopes of Thorium and daughters. No isotopes of Plutonium or other transuranics were detected.

Alpha emitting isotopes were detected in the RCS on the following dates: March 29, April 4, April 5, April 6, April 13, and April 17, 1982. It is assumed these isotopes or their daughters were collected in the letdown purification system (1A & 1B CVCS resin beds).



W. G. Griepentog

WGG/JMS:ehc

10-4-83



From: Joe Walden

To: Brian, this is

complete analytical
package for samples
sent to SAI. Samples
of Rx Coolant filter and
BTRS will be obtained
when available.

Regards,
Joe Walden

September 30, 1983

*Close out
transuranics
C. Farley*



Science Applications, Inc.

Mr. Joe Walden
Farley Nuclear Power Plant
Alabama Power Company
P. O. Box Drawer 470
Ashford, Alabama 36312-0470

Reference: Purchase Order No. B-4509

Dear Joe:

Enclosed are the results requested on the samples you sent for analysis. Samples 10232, 10233, and 10236 have had the name of the sample sub-type changed. These changes were made to accommodate the nomenclature format of the SAI Database.

If you have any questions, please call me.

Sincerely,

SCIENCE APPLICATIONS, INC.

Andrew H. Leavitt

AHL:pfc

Enclosure