(11)

February 28, 1994

Steve Orth,
Did John QA #'s?
Please label Tables so that it is clear they are NRC calcs.
A few additional comments enclosed.
Good job.
CP

NOTE TO: Cynthia Pederson, Chief
Reactor Support Programs Branch

FROM: Steven Orth, Radiation Specialist
Radiological Programs Section 1

SUBJECT: Fermi 2 Sampling Results

The results of the Fermi 2 CST discharge overview are attached in tabular form for your review. The discharge commenced on February 24, 1994 at 1921 hours (EST) and ended on February 25, 1994 at 1904 hours (EST). The NRC provided continous, 24 hour coverage of the release. Approximately 480,528 gallons of slightly contaminated water (about 4.4 mCi of activity not including H-3, which was about 873.1 mCi) were discharged to Lake Erie (Table 1). No problems were observed during the release.

The dose projections of the NRC (using the PCDOSE computer calculation) and licensee were in good agreement. The NRC calculation (Table 2) is based on the following:

1) The CST pre-discharge isotopic analysis of 2/24/94 at 1252 hours.

2) The standard consumption rates are based on Regulatory Guide 1.109 and ICRP 26 and 30.

3) The discharge flow and dilution flow were assigned 400 and 15500 gallons per minute, respectively.

4) Near field dilution factors of 77 and 5 were assigned to drinking water and fish, respectively. This is in accordance with 11.2.9.1 and Table 11.2-12 of the Fermi 2 Updated Final Safety Analysis Report, which indicates dilution factors of 77 and 100, respectively.

Why use different #?

The sampling of the CST during discharge indicated that there was adequate mixing of the tank prior to discharge and there was not any stratification during the 24 hours of discharge (Table 3). The confirmatory measurements of the CST activity indicated good agreement with the licensee's measurements (Table 4). Certain nuclides were not identified by the licensee, probably owing to the licensee's higher minimum detectable activities (MDA). This will be investigated on 2/28/94 prior to the NRC exit.

Environmental monitoring at the Monroe Water Intake and the Fermi

D-11

2 Decant line did not indicate any radioactivity attributable to the CST discharge (Tables 5-7). Potassium-40 activities were consistent throughout the sampling, indicating good sampling and accurate analyses. Some cesium-137 and cobalt-60 were noted in some counts; however, these levels were comparable to average background counts and are considered to be less than MDA for these analyses.

Data contained in this note is preliminary and will be reviewed further in the Region III office.

Steven K. Orth
Radiation Specialist

Distribution w/enclosures:

N. Shah
J. McCormick-Barger
W. Axelson
T. Colburn, PM, NRR
K. Riemer

FER - ALL. TBL

Table 1

FERMI 2 CST DISCHARGE ACTIVITY CALCULATION

Date of analysis: Average of February 24 - 25, 1994

Volume(gal)= 480528
(l)= 1.819E+06

Flow Rates: (gpm)
Dilution= 15500
CST dchg= 380

Nuclide	EC[1] uCi/ml	Conc.[2] uCi/ml	Conc./EC[3]	Activity (mCi)
Cr-51	5.000E-04	3.240E-07	6.480E-04	5.894E-01
Co-58	2.000E-05	6.355E-08	3.178E-03	1.156E-01
Co-60	3.000E-06	4.455E-07	1.485E-01	8.104E-01
I-131	1.000E-06	3.630E-08	3.630E-02	6.603E-02
Cs-134	9.000E-07	1.545E-07	1.717E-01	2.810E-01
Cs-137	1.000E-06	1.670E-07	1.670E-01	3.038E-01
Sr-89	8.000E-06	1.200E-06	1.500E-01	2.183E+00
H-3	1.000E-03	4.800E-04	4.800E-01	8.731E+02
Totals[4]		4.824E-04	1.157E+00	8.775E+02
(W/Dilution)[5]		1.154E-05	2.769E-02	

? ? ? relevance? This would not be as it appear they were over allowable. No RQ limit on total concentration as there?

[1]Effluent concentrations for release to unrestricted areas as listed in 10 CFR 20, Appendix B, Table 2, Column 2.

[2]Result of gamma isotopic analysis of Condensate Storage Tank. Gross beta activity is assigned to strontium-89. Tritium and gross beta were analyzed in the Region III laboratory.

[3]Fraction of 10 CFR 20 effluent concentrations.

[4]Total, undiluted activity from condensate storage tank.

[5]Totals with dilution credit from recirculation water.

Table 2

Fermi 2 CST Discharge
Summary of Dose Calculations

ANNUAL ADULT TOTAL DOSE RECEIVED PER ORGAN
mrem/ 12.00 mth

Nuclide	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli
Cr-51			1.42E-07	8.46E-08	3.12E-08	1.88E-07	3.56E-05
Co-58		1.37E-06	3.07E-06				2.78E-05
Co-60		2.59E-05	5.72E-05				4.87E-04
I-131	6.60E-07	9.45E-07	5.41E-07	3.10E-04	1.62E-06		2.49E-07
Cs-134	5.82E-03	1.38E-02	1.13E-02		4.48E-03	1.49E-03	2.42E-04
Cs-137	8.54E-03	1.17E-02	7.65E-03		3.96E-03	1.32E-03	2.26E-04
Sr-89	2.85E-03		8.18E-05				4.57E-04
H-3		4.84E-05	4.84E-05	4.84E-05	4.84E-05	4.84E-05	4.84E-05
TOTALS	1.72E-02	2.56E-02	1.92E-02	3.58E-04	8.50E-03	2.85E-03	1.53E-03
	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli

TEEN TOTAL DOSE RECEIVED PER ORGAN
mrem/ 12.00 mth

Nuclide	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli
Cr-51			1.46E-07	8.09E-08	3.19E-08	2.08E-07	2.45E-05
Co-58		1.36E-06	3.13E-06				1.87E-05
Co-60		2.59E-05	5.83E-05				3.37E-04
I-131	7.00E-07	9.80E-07	5.27E-07	2.86E-04	1.69E-06		1.94E-07
Cs-134	5.96E-03	1.40E-02	6.51E-03		4.46E-03	1.70E-03	1.75E-04
Cs-137	9.14E-03	1.22E-02	4.24E-03		4.14E-03	1.61E-03	1.73E-04
Sr-89	3.09E-03		8.85E-05				3.68E-04
H-3		3.51E-05	3.51E-05	3.51E-05	3.51E-05	3.51E-05	3.51E-05
TOTALS	1.82E-02	2.63E-02	1.09E-02	3.21E-04	8.64E-03	3.35E-03	1.13E-03
	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli

Table 2 (cont)

CHILD TOTAL DOSE RECEIVED PER ORGAN

mrem/ 12.00 mth

Nuclide	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli
Cr-51			1.60E-07	8.88E-08	2.43E-08	1.62E-07	8.48E-06
Co-58		1.13E-06	3.47E-06				6.62E-06
Co-60		2.20E-05	6.47E-05				1.22E-04
I-131	1.02E-06	1.03E-06	5.85E-07	3.40E-04	1.69E-06		9.16E-08
Cs-134	7.23E-03	1.19E-02	2.50E-03		3.68E-03	1.32E-03	6.39E-05
Cs-137	1.16E-02	1.11E-02	1.63E-03		3.61E-03	1.30E-03	6.93E-05
Sr-89	4.26E-03		1.22E-04				1.65E-04
H-3		5.40E-05	5.40E-05	5.40E-05	5.40E-05	5.40E-05	5.40E-05
TOTALS	2.31E-02	2.30E-02	4.38E-03	3.94E-04	7.34E-03	2.67E-03	4.89E-04
	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli

TOTAL DOSE SUMMARY REPORT

1.20E+01 mth

Group	Organ	Total
Adult	Bone	1.72E-02
Adult	Liver	2.56E-02
Adult	Tot Body	1.92E-02
Adult	Thyroid	3.58E-04
Adult	Kidney	8.50E-03
Adult	Lung	2.85E-03
Adult	Gi-Lli	1.53E-03
Teen	Bone	1.82E-02
Teen	Liver	2.63E-02
Teen	Tot Body	1.09E-02
Teen	Thyroid	3.21E-04
Teen	Kidney	8.64E-03
Teen	Lung	3.35E-03
Teen	Gi-Lli	1.13E-03
Child	Bone	2.31E-02
Child	Liver	2.30E-02
Child	Tot Body	4.38E-03
Child	Thyroid	3.94E-04
Child	Kidney	7.34E-03
Child	Lung	2.67E-03
Child	Gi-Lli	4.89E-04

ORGAN WITH MAXIMUM DOSE

Group	Organ	Total
Teen	Liver	2.63E-02

Table 3

Fermi 2 Nuclear Station
Condensate Storage Tank

Nuclide	2/24/94 1252 hrs (uCi/ml)[1]	2/24/94 2327 hrs (uCi/ml)	2/25/94 0730 hrs (uCi/ml)	2/25/94 1130 hrs (uCi/ml)
Cr-51	2.755E-07	3.726E-07	3.296E-07	3.167E-07
Co-58	6.473E-08	6.478E-08	6.567E-08	5.900E-08
Co-60	4.263E-07	4.726E-07	4.437E-07	3.911E-07
I-131	3.023E-08	2.150E-08	3.641E-08	5.714E-08
Cs-134	1.467E-07	1.435E-07	1.710E-07	1.556E-07
Cs-137	1.680E-07	1.838E-07	1.289E-07	1.474E-07

[1]uCi/ml = microcuries per milliliter. 1 uCi/ml = 37 kiloBecquerels per milliliter.

Table 4

Fermi 2 Nuclear Station
Confirmatory Measurements

SAMPLE	NUCLIDE	NRC VAL.[1]	NRC ERR.[1]	LIC.VAL.[1]	LIC.ERR.[1]	RATIO[2]	RES[3]	RESULT[4]
CST	CR-51	3.08E-07	1.28E-07	6.10E-07	1.80E-07	1.98	2.4	NC
TANK	SB-125	9.13E-08	2.85E-08	1.20E-07	4.70E-08	1.31	3.2	NC
	CO-58	8.74E-08	1.93E-08	1.00E-07	2.20E-08	1.14	4.5	A
2/21/94	CO-60	5.06E-07	3.73E-08	5.20E-07	5.00E-08	1.03	13.6	A
	I-131	6.65E-08	2.16E-08	6.00E-08	1.40E-08	0.90	3.1	A
	CS-134	1.30E-07	2.49E-08	1.50E-07	3.20E-08	1.15	5.2	A
	CS-137	1.00E-07	2.33E-08	6.70E-08	3.20E-08	0.67	4.3	A
CST	CR-51	2.76E-07	9.24E-08	2.89E-07	1.20E-07	1.05	3.0	A
PRE-	CO-58	6.47E-08	1.29E-08	0.00E+00	0.00E+00		5.0	D
DISCH	CO-60	4.26E-07	2.36E-08	5.06E-07	4.45E-08	1.19	18.0	A
2/24/94	I-131	3.02E-08	1.08E-08	7.30E-08	2.01E-08	2.42	2.8	A
1252 HRS	CS-134	1.47E-07	1.69E-08	1.64E-07	3.53E-07	1.12	8.7	A
	CS-137	1.68E-07	1.69E-08	1.11E-07	3.00E-08	0.66	10.0	A
CST	CR-51	3.73E-07	8.89E-08	2.63E-07	1.43E-07	0.71	4.2	A
TANK	CO-58	6.48E-08	1.09E-08	8.14E-08	3.13E-08	1.26	6.0	A
2/24/94	CO-60	4.73E-07	2.86E-08	5.10E-07	4.65E-08	1.08	16.5	A
2327 HRS	I-131	2.15E-08	8.93E-09	0.00E+00	0.00E+00		2.4	NC
	CS-134	1.44E-07	1.72E-08	2.02E-07	3.47E-08	1.41	8.4	A
	CS-137	1.84E-07	1.55E-08	1.89E-07	2.71E-08	1.03	11.9	A
CST	CR-51	3.30E-07	8.96E-08	3.77E-07	1.48E-07	1.14	3.7	A
TANK	CO-58	6.57E-08	1.27E-08	0.00E+00	0.00E+00		5.2	D
2/25/94	CO-60	4.92E-07	2.56E-08	4.93E-07	4.58E-08	1.00	19.2	A
0730 HRS	I-131	3.64E-08	1.39E-08	3.77E-08	1.94E-08	1.03	2.6	A
	CS-134	1.71E-07	1.73E-08	1.92E-07	3.58E-08	1.12	9.9	A
	CS-137	1.69E-07	1.67E-08	1.41E-07	3.24E-08	0.84	10.1	A
CST	CR-51	3.17E-07	9.35E-08	4.17E-07	1.16E-07	1.32	3.4	NC
TANK	CO-58	5.90E-08	1.47E-08	8.47E-08	1.83E-08	1.43	4.0	A
2/25/94	CO-60	3.91E-07	2.79E-08	5.04E-07	5.78E-08	1.29	14.0	A
1130 HRS	I-131	5.71E-08	1.21E-08	0.00E+00	0.00E+00		4.7	D
	CS-134	1.56E-07	1.92E-08	1.89E-07	2.88E-08	1.21	8.1	A
	CS-137	1.47E-07	2.43E-08	1.95E-07	3.54E-08	1.32	6.1	A

1. These quantities are in the units of microcurie per milliliter.

2. Ratio = Licensee Value / NRC Value

The highlighted disagreements— did the licensee actual get 0 for a value?

3. Resolution = NRC Value / NRC Error (one standard deviation)

4. Result : The result of the comparison is based on the criteria in Attachment 1 and is expressed by the following:

A = Agreement	* = Criteria Relaxed
D = Disagreement	NC = No Comparison

ATTACHMENT 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgement limits are variable in relation to comparisons of the NRC's value to its associated one sigma uncertainty. As that ratio, referred to in this program as "Resolution", increases, the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement should be considered acceptable as the resolution decreases. The values in the ratio criteria may be rounded to fewer significant figures reported by the NRC Reference Laboratory, unless such rounding will result in a narrowed category of acceptance.

RESOLUTION	RATIO = LICENSEE VALUE/ NRC REFERENCE VALUE
	AGREEMENT
< 4	NO COMPARISON
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
> 200	0.85 - 1.18

Some discrepancies may result from the use of different equipment, techniques, and for some specific nuclides. These may be factored into the acceptance criteria and identified on the data sheet.

Table 5

Fermi 2 Nuclear Station
Decant Line Sample Point

Nuclide	2/24/94 1340 hrs (uCi/ml)[1]	2/25/94 2230 hrs (uCi/ml)	2/25/94 0610 hrs (uCi/ml)	2/25/94 1400 hrs (uCi/ml)	2/26/94 1205 hrs (uCi/ml)
K-40	1.480E-06	2.291-06	2.325E-06	1.992E-06	1.667E-06
Cr-51	< MDA[2]	< MDA	< MDA	< MDA	< MDA
Co-58	< MDA	< MDA	< MDA	< MDA	< MDA
Co-60	< MDA	< MDA	< MDA	< MDA	< MDA
I-131	< MDA	< MDA	< MDA	< MDA	< MDA
Cs-134	< MDA	< MDA	< MDA	< MDA	< MDA
Cs-137	< MDA	< MDA	< MDA	< MDA	< MDA

[1]uCi/ml = microcuries per milliliter. 1 uCi/ml = 37 kiloBecquerels per milliliter.

[2]MDA = Minimum Detectable Activity. This is defined as 4.66 X one sigma error of background count.

Table 6
Monroe Public Water Intake Structure

Nuclide	2/24/94 1830 hrs (uCi/ml)[1]	2/25/94 0125 hrs (uCi/ml)	2/25/94 0710 hrs (uCi/ml)	2/25/94 1325 hrs (uCi/ml)
K-40	2.184E-06	1.890E-06	2.161E-06	2.044E-06
Cr-51	< MDA[2]	< MDA	< MDA	< MDA
Co-58	< MDA	< MDA	< MDA	< MDA
Co-60	< MDA	< MDA	< MDA	< MDA
I-131	< MDA	< MDA	< MDA	< MDA
Cs-134	< MDA	< MDA	< MDA	< MDA
Cs-137	< MDA	< MDA	< MDA	< MDA

Nuclide	2/25/94 1930 hrs (uCi/ml)	2/26/94 0330 hrs (uCi/ml)	2/26/94 1140 hrs (uCi/ml)	2/26/94 1830 hrs (uCi/ml)
K-40	2.150E-06	1.810E-06	1.926E-06	2.022E-06
Cr-51	< MDA	< MDA	< MDA	< MDA
Co-58	< MDA	< MDA	< MDA	< MDA
Co-60	< MDA	< MDA	< MDA	< MDA
I-131	< MDA	< MDA	< MDA	< MDA
Cs-13	< MDA	< MDA	< MDA	< MDA
Cs-137	< MDA	< MDA	< MDA	< MDA

Nuclide	2/27/94 0325 hrs (uCi/ml)	2/27/94 1130 hrs (uCi/ml)	2/27/94 1930 hrs (uCi/ml)
K-40	2.004E-06	1.706E-06	2.364E-06
Cr-51	< MDA	< MDA	< MDA
Co-58	< MDA	< MDA	< MDA
Co-60	< MDA	< MDA	< MDA
I-131	< MDA	< MDA	< MDA
Cs-134	< MDA	< MDA	< MDA
Cs-137	< MDA	< MDA	< MDA

[1]uCi/ml = microcuries per milliliter. 1 uCi/ml = 37 kiloBecquerels per milliliter.

[2]MDA = Minimum Detectable Activity. This is defined as 4.66 X the one sigma error of the background count.

Table 7

Minimum Detectable Activity[1]

Nuclide	Activity (uCi/ml)[2]	Activity (Bq/ml)[3]
Cr-51	1.5E-07	5.6E-03
Co-58	2.2E-08	8.1E-04
Co-60	3.5E-08	1.3E-03
I-131	1.8E-08	6.7E-04
Cs-134	1.8E-08	6.7E-04
Cs-137	2.8E-08	1.0E-03

[1]Minimum Detectable Activity: This is defined as 4.66 X the one sigma error of the background count.

[2]uCi/ml = microcuries per milliliter

[3]Bq/ml = Becquerels per milliliter

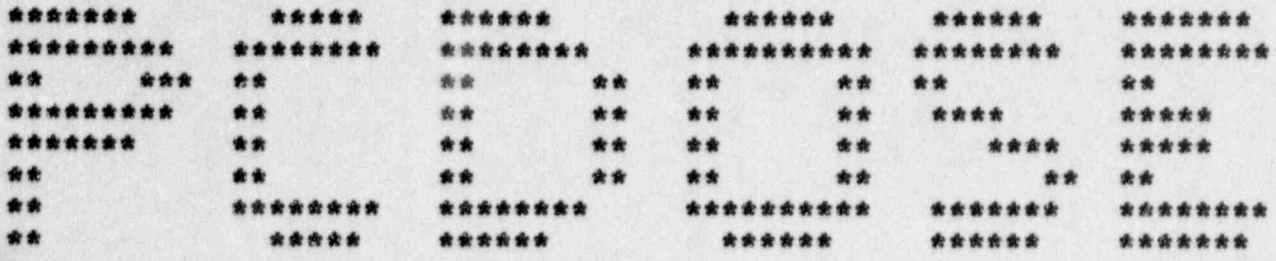
Fermi 2 Water issues cst_224a.wks
Date of analysis: FEB 24, 1994

Volume(gal)= 532000
(l)= 2.014E+06

Flow Rates: (gpm)
Dilution= 20000
CST dchg= 400

Isotope	Eff Conc uCi/ml (10CFR20)	Result uCi/ml	RESULT/EC	Activity (mCi)
Cr-51	5.000E-04	2.199E-07	4.398E-04	4.428E-01
Mn-54	3.000E-05	0.000E+00	0.000E+00	0.000E+00
Co-58	2.000E-05	9.511E-08	4.756E-03	1.915E-01
Co-60	3.000E-06	4.184E-07	1.395E-01	8.426E-01
Sb-125	3.000E-05	1.096E-07	3.653E-03	2.207E-01
I-131	1.000E-06	2.702E-08	2.702E-02	5.441E-02
Cs-134	9.000E-07	1.415E-07	1.572E-01	2.850E-01
Cs-137	1.000E-06	1.567E-07	1.567E-01	3.156E-01
Sr-89	8.000E-06	5.800E-07	7.250E-02	1.168E+00
H-3	1.000E-03	4.800E-04	4.800E-01	9.666E+02
Totals		4.817E-04	1.042E+00	9.702E+02
(w/Dilution)		9.446E-06	2.043E-02	

FCR-224A.WK5



CALCULATES THE DOSE DUE TO

NUCLEAR POWER PLANT

LIQUID

RADIOACTIVE EFFLUENTS

U. S. NUCLEAR REGULATORY COMMISSION

PCDOSE

LIQUID DOSE CALCULATIONS

from

NUCLEAR POWER PLANT EFFLUENTS

Rev. 35 01/31/92

24-Feb-94

FILENAME ????????.WK1 PLANT NAME Feb-94
24-Feb I N D I V I D U A L M A X I M U M 03:42 PM

Dilution
ENTER PLANT SPECIFIC DATA

FRESH WATER
Flow Rate = 2.00E+04 g/min
Average Flow During Report Period

Radioactive Release
WHEN COMPLETED ====> Press ALT E

Flow Rate = 4.00E+02 g/min
Flow Time = 2.50E+01 hr
Report Period = 3.00E+00 mth

Individual Average Consumption(kg/y)

Pathways	Adult	Teen	Child
Water	730	510	510
SportFish	21	16	6.9
SportInvt	5	3.8	1.7

Transit Times (hrs)
Drinking Water = 0.01
Fish/Invertebrates = 0.01

Comments:

FILENAME ????????.WK1 PLANT NAME Feb-94
24-Feb I N D I V I D U A L M A X I M U M 03:42 PM

ENTER RADIOACTIVITY RELEASED FOR EACH RADIONUCLIDE

Nuclide	uCi/ml	WHEN COMPLETED ====> Press ALT J
Co-60	4.18E-07	
Cs-134	1.42E-07	
Cs-137	1.57E-07	
I-131	2.70E-08	
Cr-51	2.20E-07	
Sr-89	5.80E-07	
H-3	4.80E-04	
Co-58	9.51E-08	

WHEN COMPLETED ====> Press ALT J

ADDITIONAL DILUTION FACTORS

Food Consumption Products:

1. Potable Water Near Field	====>	Dw	=	7.70E+01
2. Sport Fish	====>	Dsf	=	5.00E+00
3. Sport Invert	====>	Dsi	=	5.00E+00
4. Commercial Fish	====>	Dcf	=	5.00E+00
5. Commercial Invert	====>	Dci	=	5.00E+00

FILENAME ????????.WK1 PLANT NAME Feb-94
24-Feb I N D I V I D U A L M A X I M U M 03:42 PM

ADULT TOTAL DOSE RECEIVED PER ORGAN
mrem/ 3.00 mth

Nuclide	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli
Co-60		2.14E-05	4.73E-05				4.03E-04
Cs-134	4.73E-03	1.13E-02	9.20E-03		3.64E-03	1.21E-03	1.97E-04
Cs-137	6.71E-03	9.18E-03	6.01E-03		3.12E-03	1.04E-03	1.78E-04
I-131	4.97E-07	7.11E-07	4.08E-07	2.33E-04	1.22E-06		1.88E-07
Cr-51			9.52E-08	5.69E-08	2.10E-08	1.26E-07	2.39E-05
Sr-89	2.40E-03		6.89E-05				3.85E-04
H-3		4.08E-05	4.08E-05	4.08E-05	4.08E-05	4.08E-05	4.08E-05
Co-58		1.70E-06	3.80E-06				3.44E-05

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli
TOTALS	1.38E-02	2.05E-02	1.54E-02	2.74E-04	6.80E-03	2.29E-03	1.26E-03

FILENAME ????????.WK1 PLANT NAME Feb-94
24-Feb I N D I V I D U A L M A X I M U M 03:42 PM

TEEN TOTAL DOSE RECEIVED PER ORGAN
mrem/ 3.00 mth

Nuclide	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli
Co-60		2.14E-05	4.82E-05				2.79E-04
Cs-134	4.85E-03	1.14E-02	5.29E-03		3.62E-03	1.38E-03	1.42E-04
Cs-137	7.18E-03	9.55E-03	3.33E-03		3.25E-03	1.26E-03	1.36E-04
I-131	5.27E-07	7.38E-07	3.97E-07	2.15E-04	1.27E-06		1.46E-07
Cr-51			9.79E-08	5.44E-08	2.15E-08	1.40E-07	1.65E-05
Sr-89	2.60E-03		7.45E-05				3.10E-04
H-3		2.96E-05	2.96E-05	2.96E-05	2.96E-05	2.96E-05	2.96E-05
Co-58		1.68E-06	3.88E-06				2.32E-05

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli
TOTALS	1.46E-02	2.10E-02	8.78E-03	2.45E-04	6.91E-03	2.68E-03	9.36E-04

FILENAME ????????.WK1 PLANT NAME Feb-94
24-Feb I N D I V I D U A L M A X I M U M 03:42 PM

TOTAL DOSE SUMMARY REPORT
mrem/3.00E+00 mth

Group	Organ	Total
Adult	Bone	1.38E-02
Adult	Liver	2.05E-02
Adult	Tot Body	1.54E-02
Adult	Thyroid	2.74E-04
Adult	Kidney	6.80E-03
Adult	Lung	2.29E-03
Adult	Gi-Lli	1.26E-03
Teen	Bone	1.46E-02
Teen	Liver	2.10E-02
Teen	Tot Body	8.78E-03
Teen	Thyroid	2.45E-04
Teen	Kidney	6.91E-03
Teen	Lung	2.68E-03
Teen	Gi-Lli	9.36E-04
Child	Bone	1.85E-02
Child	Liver	1.84E-02
Child	Tot Body	3.52E-03
Child	Thyroid	3.02E-04
Child	Kidney	5.87E-03
Child	Lung	2.14E-03
Child	Gi-Lli	4.05E-04

mrem/3.00E+00 mth

ORGAN WITH MAXIMUM DOSE

Group	Organ	Total
Teen	Liver	2.10E-02

FILENAME ????????.WK1 PLANT NAME Feb-94
24-Feb I N D I V I D U A L M A X I M U M 03:42 PM

CHILD TOTAL DOSE RECEIVED PER ORGAN
mrem/ 3.00 mth

Nuclide	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli
Co-60		1.82E-05	5.35E-05				1.01E-04
Cs-134	5.87E-03	9.64E-03	2.03E-03		2.99E-03	1.07E-03	5.20E-05
Cs-137	9.09E-03	8.70E-03	1.28E-03		2.84E-03	1.02E-03	5.45E-05
I-131	7.70E-07	7.75E-07	4.40E-07	2.56E-04	1.27E-06		6.90E-08
Cr-51			1.08E-07	5.97E-08	1.63E-08	1.09E-07	5.70E-06
Sr-89	3.59E-03		1.02E-04				1.39E-04
H-3		4.55E-05	4.55E-05	4.55E-05	4.55E-05	4.55E-05	4.55E-05
Co-58		1.40E-06	4.30E-06				8.19E-06

TOTALS	1.85E-02	1.84E-02	3.52E-03	3.02E-04	5.87E-03	2.14E-03	4.05E-04
	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-Lli

****
********** 24-FEB-94 13:38:35 **********
****

FERMI 2 CST PRE DISCHARGE SAMPLE.

SPECTRAL FILE NAME: L940411.FEV
SAMPLE DATE: 24-FEB-94 10:42:00
SAMPLE IDENTIFICATION: L940411.FEV
TYPE OF SAMPLE: WATER
SAMPLE QUANTITY: 602.8000 UNITS: gram
SAMPLE GEOMETRY: LMAR500
EFFICIENCY FILE NAME: LMAR500.EFF

****

ACQUIRE DATE: 24-FEB-94 11:28:19
PRESET TIME(LIVE): 3600. SEC
ELAPSED REAL TIME: 3601. SEC
ELAPSED LIVE TIME: 3600. SEC

* FWHM(1332) 1.886
* SENSITIVITY: 5.000
* SHAPE PARAMETER : 5.0 %
* NBR ITERATIONS: 10.

****

DETECTOR: ORTEC
CALIB DATE: 23-FEB-94 07:26:01
KEV/CHNL: .4697016
OFFSET: .3932300 KEV

* LIBRARY:MASTER.LIB
* ENERGY TOLERANCE: 1.500 KEV
* HALF LIFE RATIO: 8.00
* ABUNDANCE LIMIT: 0.00%

****

ENERGY WINDOW 40.29 TO 2858.03

PK	IT	ENERGY	AREA	BKGND	FWHM	CHANNEL	LEFT	PW	CTS/SEC	%ERR	FIT
1	0	238.71	51.	234.	1.06	423.43	419	11	1.41E-02	60.9	
2	0	320.24	72.	149.	1.02	597.61	593	9	1.99E-02	33.5	
3	0	364.80	66.	155.	.93	691.87	687	11	1.83E-02	37.1	
4	0	427.81	86.	122.	1.06	826.03	821	11	2.40E-02	28.4	
5	0	511.16	238.	174.	3.14	1003.48	995	17	6.62E-02	14.9	
6	0	528.72	42.	67.	1.42	1040.86	1036	11	1.18E-02	44.7	
7	0	569.27	43.	77.	1.58	1127.31	1122	11	1.18E-02	44.7	
8	0	604.69	289.	161.	1.22	1202.60	1196	13	8.02E-02	11.1	
9	0	661.84	261.	53.	1.44	1324.38	1319	11	7.24E-02	9.1	
10	0	795.61	202.	49.	1.47	1609.09	1603	15	6.44E-02	9.8	
11	0	810.99	159.	34.	2.16	1641.32	1637	13	4.42E-02	12.8	
12	0	1173.29	589.	38.	1.78	2413.16	2406	16	1.64E-01	4.9	
13	0	1332.61	513.	39.	1.66	2752.36	2742	18	1.43E-01	4.9	
14	0	1460.84	215.	4.	1.88	3025.36	3018	15	5.98E-02	7.5	
15	0	1764.52	30.	8.	1.88	3671.90	3666	13	8.43E-03	27.5	
16	0	2614.57	47.	2.	1.16	5481.67	5472	17	1.29E-02	15.6	

PEAK SEARCH COMPLETED (REV 15.8 - ND PC VERSION NOV 89)

PEAK DATA CORRECTED FOR ENVIRONMENTAL BACKGROUND
* AFTER ENERGY INDICATES CORRECTED PEAK

PK	IT	ENERGY	AREA	BKGND	FWHM	CHANNEL	LEFT	PW	CTS/SEC	%ERR	FIT
1	0	238.71*	4.	234.	1.06	423.43	419	11	1.08E-03	****	

3	0	364.80	86.	120.	.73	671.87	667	11	1.83E-02	37.1
4	0	427.81	86.	122.	1.06	826.03	821	11	2.40E-02	28.4
5	0	511.16*	46.	174.	3.14	1003.48	995	17	1.27E-02	****
6	0	528.72	42.	67.	1.42	1040.86	1036	11	1.18E-02	44.7
7	0	569.27	43.	77.	1.58	1127.21	1122	11	1.18E-02	44.7
8	0	604.69	289.	161.	1.22	1202.60	1196	13	8.02E-02	11.1
9	0	661.84	261.	53.	1.44	1324.28	1319	11	7.24E-02	9.1
10	0	795.61	232.	42.	1.47	1609.09	1603	15	6.44E-02	9.8
11	0	810.99	159.	34.	2.16	1641.82	1637	13	4.42E-02	12.3
12	0	1173.29	589.	30.	1.78	2413.16	2406	16	1.64E-01	4.9
13	0	1332.61*	489.	29.	1.66	2752.36	2742	18	1.36E-01	5.6
14	0	1460.84*	12.	4.	1.88	3025.36	3018	15	3.43E-03	****

1764.52 KEV PEAK DELETED

2614.57 KEV PEAK DELETED

NUCLIDE IDENTIFICATION SYSTEM, (ND PC VERSION DEC 88)
UNKNOWN LINE REPORT

UNIDENTIFIED PEAKS

PK	IT	ENERGY	AREA	BKGND	FWHM	CHANNEL	LEFT	PW	CTS/SEC	%ERR	%EFF
1	0	238.71	4.	234.	1.06	423.43	419	11	1.08E-03	****	5.04E+0
4	0	427.81	86.	122.	1.06	826.03	821	11	2.40E-02	28.4	3.33E+0

LINES NOT MEETING SUMMARY CRITERIA

PK	NUCLIDE	ENERGY	HLFE	DECAY	UCI	/gram	ABNDIFF	FAILED
1	TH-232	238.63	1.00E+10Y	1.000E	0	2.157E -9	25.03%	ABN
3	NI-65	366.27	2.52H	1.414E	0	6.701E -7	10.74%	ABN
4	SB-125	427.89	2.77Y	1.000E	0	1.096E -7	38.75%	ABN
7	U-238	569.50	1.00E+10Y	1.000E	0	1.771E -7	12.81%	ABN

TOTAL LINES IN SPECTRUM	14	
UNIDENTIFIED PEAKS	2	
IDENTIFIED IN SUMMARY REPORT	12	85.71%

ACTIVATION PRODUCT

NUCLIDE	CBHR	HLIFE	DECAY	UCI /gram	1-SIGMA ERROR	%ERR
ANIL-511	AP	109.70M	1.610	3.210E -8	3.388E -8	105.53
CR-51	AP	27.70D	1.001	2.129E -7	7.371E -8	33.52
CO-58	AP	70.80D	1.001	2.511E -8	1.217E -8	12.80
CO-60	AP	1925.00D	1.000	4.184E -7	2.345E -8	5.60

HALOGEN FISSION PRODUCT

NUCLIDE	CBHR	HLIFE	DECAY	UCI /gram	1-SIGMA ERROR	%ERR
I-131	HFP	8.04D	1.005	2.702E -8	1.003E -8	37.14
~~I-133~~	HFP	20.80H	1.043	2.220E -8	9.932E -9	44.73

FISSION PRODUCT

NUCLIDE	CBHR	HLIFE	DECAY	UCI /gram	1-SIGMA ERROR	%ERR
~~RH-105~~	FP	35.36H	1.025	1.153E -7	3.864E -8	33.52
CS-134	FP	753.10D	1.000	1.415E -7	1.567E -8	11.07
CS-137	FP	30.17Y	1.000	1.567E -7	1.426E -8	9.10

NATURAL PRODUCT

NUCLIDE	CBHR	HLIFE	DECAY	UCI /gram	1-SIGMA ERROR	%ERR
K-40	NP	1.28E+09Y	1.000	1.059E -7	1.975E -7	186.49

24-FEB-94 13:36:39

FERMI 2 CST PRE DISCHARGE SAMPLE.

SPECTRAL FILE NAME: L940411.FEV
SAMPLE DATE: 24-FEB-94 10:42:00
SAMPLE IDENTIFICATION: L940411.FEV
TYPE OF SAMPLE: WATER
SAMPLE QUANTITY: 502.3000 UNITS: gram
SAMPLE GEOMETRY: LMAR500
EFFICIENCY FILE NAME: LMAR500.EFF

ACQUIRE DATE: 24-FEB-94 11:28:19
PRESET TIME(LIVE): 3600. SEC
ELAPSED REAL TIME: 3601. SEC
ELAPSED LIVE TIME: 3600. SEC

FWHM(1332) 1.806
SENSITIVITY 5.000
SHAPE PARAMETER 5.0
NBR ITERATIONS 10

DETECTOR: ORTEC
CAL'B DATE: 23-FEB-94 07:28:01
KEV/CHNL: .4697016
OFFSET: .3232300 KEV

LIBRARY:MASTER.LIB
ENERGY TOLERANCE: 1.500 KEV
HALF LIFE RATIO: 8.00
ABUNDANCE LIMIT: 70.000

ENERGY WINDOW 40.29 TO 2658.03

PK	IT	ENERGY		AREA	BKGND	FWHM	CHANNEL	LEFT	PW	CTS/SEC	%ERR	FIT
1	0	238.71	TH-232	51.	234.	1.06	423.43	419	11	1.41E-02	60.9	
2	0	320.24	CR-51	72.	149.	1.02	597.01	593	9	1.99E-02	33.5	
3	0	364.80	I-131	66.	155.	.93	691.87	687	11	1.83E-02	37.1	
4	0	427.81	SB-125	86.	122.	1.06	826.03	821	11	2.40E-02	28.4	
5	0	511.16	ANNIH	238.	174.	3.14	1003.48	998	17	6.63E-02	14.9	
6	0	528.72		42.	67.	1.42	1040.86	1036	11	1.18E-02	44.7	
7	0	569.27	CS-134	43.	77.	1.58	1127.21	1122	11	1.18E-02	44.7	
8	0	604.69	CS-134	289.	161.	1.22	1202.60	1196	13	8.02E-02	12.1	
9	0	661.84	CS-137	261.	93.	1.44	1324.28	1319	11	7.24E-02	9.1	
10	0	795.61	CS-134	132.	49.	1.47	1609.09	1603	13	6.44E-02	9.8	
11	0	810.99	CO-58	159.	34.	2.16	1641.82	1637	13	4.42E-02	12.8	
12	0	1173.29	CO-60	589.	38.	1.78	2413.16	2406	16	1.64E-01	4.9	
13	0	1332.61	CO-60	513.	39.	1.66	2752.36	2742	18	1.43E-01	4.9	
14	0	1460.84	K-40	215.	4.	1.88	3025.36	3018	15	5.98E-02	7.5	
15	0	1764.52	RA-226	30.	8.	1.83	3671.90	3666	13	8.43E-03	27.5	
16	0	2614.57	TH-232	47.	2.	1.16	5481.67	5472	17	1.29E-02	15.0	

PEAK SEARCH COMPLETED (REV 15.8 - ND PC VERSION NOV 89)

PULSE-PILE-UP CORRECTED DATA. CORRECTION = 1.000
UNCORR. LIVE TIME: 3600. CORRECTED LIVE TIME: 3600.

PK	IT	ENERGY	AREA	BKGND	FWHM	CHANNEL	LEFT	PW	CTS/SEC	%ERR
1	0	238.71	51.	234.	1.06	423.43	419	11	1.41E-02	60.9
2	0	320.24	72.	149.	1.02	597.01	593	9	1.99E-02	33.5
3	0	364.80	66.	155.	.93	691.87	687	11	1.83E-02	37.1

6	0	528.72	42.	67.	1.42	1040.86	1036	11	1.18E-02	44.7
7	0	569.27	43.	77.	1.58	1127.21	1122	11	1.18E-02	44.7
8	0	604.69	289.	161.	1.22	1202.60	1196	13	8.02E-02	11.1
9	0	661.84	261.	53.	1.44	1324.28	1319	11	7.24E-02	9.1
10	0	795.61	232.	49.	1.47	1609.09	1603	15	6.64E-02	9.8
11	0	810.99	159.	34.	2.16	1641.32	1637	13	4.42E-02	12.8
12	0	1173.29	589.	38.	1.78	2413.16	2406	16	1.64E-01	4.9
13	0	1382.61	513.	30.	1.66	2752.36	2742	18	1.43E-01	4.9
14	0	1460.84	215.	4.	1.88	3025.36	3018	15	5.98E-02	7.5
15	0	1764.52	30.	8.	1.88	3671.90	3666	15	8.33E-03	27.3
16	0	2614.57	47.	2.	1.16	5481.65	5472	17	1.29E-02	15.6

PILE-UP CORRECTION COMPLETED

NUCLIDE IDENTIFICATION SYSTEM (NO PC VERSION DEC 88)
NUCLIDE LINE ACTIVITY REPORT
ELAPSED LIVE TIME: 3600. (PILE-UP CORRECTED)

ACTIVATION PRODUCT

NUCLIDE	SBHR	ENERGY	AREA	BKGND	%ABN	%EFF	UCI / gram	1-SIGMA ERROR
ANIL-511	AP	511.00	238.	174.	96.73*	2.942E+00	1.679E -7	2.502E -8
CR-51	AP	320.08	72.	149.	9.83*	4.125E+00	2.199E -7	7.371E -8
CO-58	AP	810.76	159.	34.	99.40*	2.098E+00	9.511E -8	1.217E -8
CO-60	AP	1173.22	589.	38.	100.00	1.600E+00	4.564E -7	2.250E -8
		1332.49	513.	39.	100.00*	1.457E+00	4.389E -7	2.151E -8
NI-65	AP	366.27	66.	155.	4.61	3.759E+00	6.701E -7	2.488E -7
		1115.52	0.	0.	14.80	0.000E+00	.000E 0	.000E 0
		1481.84	0.	0.	23.50*	0.000E+00	.000E 0	.000E 0

HALOGEN FISSION PRODUCT

NUCLIDE	SBHR	ENERGY	AREA	BKGND	%ABN	%EFF	UCI / gram	1-SIGMA ERROR
I-131	HFP	284.30	0.	0.	6.05	0.000E+00	.000E 0	.000E 0
		364.48	66.	155.	81.20*	3.759E+00	2.702E -8	1.003E -8
		636.97	0.	0.	7.26	0.000E+00	.000E 0	.000E 0
		722.89	0.	0.	1.80	0.000E+00	.000E 0	.000E 0
I-133	HFP	529.87	42.	47.	86.30*	3.870E+00	9.720E -8	2.932E -8
		706.58	0.	0.	1.49	0.000E+00	.000E 0	.000E 0
		856.28	0.	0.	1.23	0.000E+00	.000E 0	.000E 0
		875.33	0.	0.	4.47	0.000E+00	.000E 0	.000E 0
		1236.41	0.	0.	1.49	0.000E+00	.000E 0	.000E 0
		1298.22	0.	0.	2.33	0.000E+00	.000E 0	.000E 0

FISSION PRODUCT

NUCLIDE	SBHR	ENERGY	AREA	BKGND	%ABN	%EFF	UCI / gram	1-SIGMA ERROR
RH-105	FP	306.10	0.	0.	5.13	0.000E+00	.000E 0	.000E 0
		319.90	72.	149.	19.20*	4.125E+00	1.153E -7	3.864E -8
SB-125	FP	176.33	0.	0.	6.89	0.000E+00	.000E 0	.000E 0
		427.89	86.	122.	29.33*	3.353E+00	1.096E -7	3.106E -8
		463.38	0.	0.	10.35	0.000E+00	.000E 0	.000E 0
		600.56	0.	0.	17.80	0.000E+00	.000E 0	.000E 0
		635.90	0.	0.	11.32	0.000E+00	.000E 0	.000E 0
CS-134	FP	563.23	0.	0.	8.38	0.000E+00	.000E 0	.000E 0
		569.32	43.	77.	15.43	1.725E+00	1.263E -7	5.648E -8
		604.70	289.	161.	97.60*	2.602E+00	1.415E -7	1.567E -8
		795.85	232.	49.	85.40	2.128E+00	1.590E -7	1.563E -8
		801.93	0.	0.	8.73	0.000E+00	.000E 0	.000E 0
CS-137	FP	661.65	261.	53.	85.12*	2.435E+00	1.567E -7	1.427E -8

NATURAL PRODUCT

NUCLIDE	SBHR	ENERGY	AREA	BKGND	%ABN	%EFF	UCI / gram	1-SIGMA ERROR
K-40	NP	1460.81	215.	4.	10.67*	1.362E+00	1.844E -6	1.385E -7

ELAPSED LIVE TIME: 3600. (PILE-UP CORRECTED)

NATURAL PRODUCT

NUCLIDE	SUBHR	ENERGY	AREA	BKGND	%ABN	%EFF	UCI / gram	1-SIGMA ERROR
RA-226	NP	186.21	0.	0.	3.28	0.000E+00	.000E 0	.000E 0
		241.98	0.	0.	7.47	0.000E+00	.000E 0	.000E 0
		295.21	0.	0.	19.20	0.000E+00	.000E 0	.000E 0
		351.92	0.	0.	37.20	0.000E+00	.000E 0	.000E 0
		609.31	0.	0.	46.30*	0.000E+00	.000E 0	.000E 0
		1120.29	0.	0.	15.10	0.000E+00	.000E 0	.000E 0
		1238.11	0.	0.	5.94	0.000E+00	.000E 0	.000E 0
		1764.49	30.	8.	15.30	1.186E+00	2.017E -7	5.551E -8
		2204.22	0.	0.	4.98	0.000E+00	.000E 0	.000E 0
TH-232	NP	238.63	51.	234.	44.60	5.038E+00	2.808E -8	1.709E -8
		338.32	0.	0.	11.40	0.000E+00	.000E 0	.000E 0
		727.17	0.	0.	11.80	0.000E+00	.000E 0	.000E 0
		583.14	0.	0.	30.23	0.000E+00	.000E 0	.000E 0
		911.07	0.	0.	27.70	0.000E+00	.000E 0	.000E 0
		969.11	0.	0.	16.30	0.000E+00	.000E 0	.000E 0
		2614.66	47.	2.	35.80*	8.082E-01	1.822E -7	2.737E -8
U-238	NP	131.20	0.	0.	20.10*	0.000E+00	.000E 0	.000E 0
		152.70	0.	0.	6.20*	0.000E+00	.000E 0	.000E 0
		569.50	43.	37.	11.00	2.719E+00	1.771E -7	7.922E -8
		800.31	0.	0.	12.20	0.000E+00	.000E 0	.000E 0
		883.24	0.	0.	12.30	0.000E+00	.000E 0	.000E 0
		926.00	0.	0.	11.20	0.000E+00	.000E 0	.000E 0
		946.00	0.	0.	12.00	0.000E+00	.000E 0	.000E 0

ELAPSED LIVE TIME 3600. (PILE-UP CORRECTED)

UNIDENTIFIED PEAKS

PK	IT	ENERGY	AREA	BKGND	FWHM	CHANNEL	LEFT	PW	CTS/SEC	%ERR	%EFF
1	0	238.71	51.	234.	1.06	423.43	419	11	1.41E-02	60.9	5.04E+00
4	0	427.81	86.	122.	1.06	826.03	821	11	2.40E-02	28.4	3.35E+00
15	0	1764.52	30.	8.	1.88	3671.90	3666	13	8.43E-03	27.5	1.19E+00
16	0	2614.57	47.	2.	1.16	5481.67	5472	17	1.29E-02	15.0	8.38E-01

LINES NOT MEETING SUMMARY CRITERIA

PK	NUCLIDE	ENERGY	HLFE	DECAY	UCI	/gram	ABNDIFF	FAILED
1	TH-232	238.63	1.00E+10Y	1.000E 0		2.808E -8	45.15%	ABN
3	NI-65	366.27	2.52H	1.414E 0		6.701E -7	10.74%	ABN
4	SB-125	427.89	2.77Y	1.000E 0		1.096E -7	38.75%	ABN
7	U-238	569.50	1.00E+10Y	1.000E 0		1.771E -7	12.84%	ABN
15	RA-226	1764.49	1600.00Y	1.000E 0		2.017E -7	10.17%	ABN
16	TH-232	2614.66	1.00E+10Y	1.000E 0		1.822E -7	45.15%	ABN

TOTAL LINES IN SPECTRUM	16	
UNIDENTIFIED PEAKS	4	
IDENTIFIED IN SUMMARY REPORT	12	75.00%

ACTIVATION PRODUCT

NUCLIDE	SUMR	HLIFE	DECAY	UCI /gram	1-SIGMA ERROR	%ERR
ANIL-511	AP	109.70M	1.610	1.679E -7	2.502E -8	14.90
CR-51	AP	27.70D	1.001	2.199E -7	7.371E -8	33.52
CO-58	AP	70.80D	1.001	9.511E -8	1.217E -8	12.80
CO-60	AP	1925.00D	1.000	4.389E -7	2.151E -8	4.90

HALOGEN FISSION PRODUCT

NUCLIDE	SUMR	HLIFE	DECAY	UCI /gram	1-SIGMA ERROR	%ERR
I-131	HFP	8.04D	1.005	2.702E -8	1.003E -8	37.14
I-133	HFP	20.80H	1.043	2.220E -8	9.932E -9	44.73

FISSION PRODUCT

NUCLIDE	SUMR	HLIFE	DECAY	UCI /gram	1-SIGMA ERROR	%ERR
RH-105	FP	35.36H	1.025	1.153E -7	3.864E -8	33.52
CS-134	FP	753.10D	1.000	1.415E -7	1.567E -8	11.07
CS-137	FP	30.17Y	1.000	1.567E -7	1.426E -8	9.10

NATURAL PRODUCT

NUCLIDE	SUMR	HLIFE	DECAY	UCI /gram	1-SIGMA ERROR	%ERR
K-40	NP	1.28E+09Y	1.000	1.844E -6	1.385E -7	7.51

MINIMUM DETECTABLE ACTIVITY REPORT (ND PC VERSION SEP 89)

PEAK WIDTH = 3.00 FWHM. CONFIDENCE LEVEL = 4.66.

NUCLIDE	BKG	ENERGY	MINIMUM UCI /gram
BE-7	121.	477.59	1.8726E-07
NA-22	20.	1274.54	1.8157E-08
NA-24	26.	1368.53	2.3274E-08
CL-38	3.	2167.51	0.0000E+00
AR-41	30.	1293.64	3.6823E-08
SC-46	57.	1120.51	2.7447E-08
MN-54	105.	834.83	2.9275E-08
MN-56	54.	846.75	3.0330E-08
FE-59	56.	1099.22	4.7408E-08
CO-57	193.	122.06	1.5362E-08
NI-65	15.	1481.84	1.0647E-07
CU-64	29.	1345.90	5.0100E-08
ZN-65	72.	1115.52	6.0564E-08
ZN-69M	97.	438.63	1.8400E-08
AS-76	73.	559.10	3.9275E-08
SE-75	130.	264.65	2.4723E-08
BR-82	91.	554.32	2.7355E-08
BR-84	60.	881.50	2.9159E-07
KR-85	179.	513.99	5.8131E-06
KR-85M	160.	151.18	1.0231E-08
KR-87	125.	402.58	7.0336E-08
KR-88	152.	196.32	6.4960E-08
RB-88	25.	1836.01	2.4210E-08
RB-89	56.	1031.88	1.3566E-08
SR-85	179.	513.99	2.5194E-08
SR-85M	150.	231.69	3.6666E-08
SR-91	58.	1024.30	8.7373E-08
SR-92	17.	1383.94	2.7509E-08
Y-88	25.	1836.01	2.6697E-08
Y-91	34.	1204.90	7.4851E-08
Y-91MD	87.	555.57	2.1270E-08
Y-92	79.	934.46	2.6084E-07
Y-93	132.	266.90	2.3678E-07
ZR-95	58.	756.72	3.5576E-08
ZR-97	66.	743.36	2.3387E-08
NB-94	53.	702.63	1.7368E-08
NB-95	65.	765.79	2.1131E-08
NB-97D	65.	1024.50	2.6730E-08
MO-90	131.	257.34	2.1861E-08
MO-99	61.	739.58	1.5592E-07
TC-99MD	171.	140.51	1.4008E-08
RU-103	72.	497.08	1.7408E-08
RU-105	51.	724.50	4.3853E-08
RU-106	69.	621.84	1.8148E-07
AG-110M	57.	657.75	1.7867E-08
CD-109	110.	88.03	3.6274E-07
SN-113	98.	391.69	2.3402E-08
SB-122	116.	563.93	3.0923E-08
SB-124	254.	602.71	3.4147E-08
SB-125	190.	427.89	7.6672E-08

PEAK WIDTH = 3.00 FWHM. CONFIDENCE LEVEL = 4.66.

NUCLIDE	BKG	ENERGY	MINIMUM UCI /gram
TE-123M	172.	158.99	1.4998E-08
TE-132	135.	228.16	1.5261E-08
I-132	63.	667.69	2.6711E-08
I-134	51.	847.03	5.9362E-08
I-135	27.	1260.41	8.3348E-08
XE-131M	170.	163.93	6.3759E-07
XE-133	111.	80.99	4.3581E-08
XE-133M	146.	233.22	1.3934E-07
XE-135	140.	249.79	1.8026E-08
XE-135M	79.	526.56	6.5347E-07
XE-138	108.	258.31	1.7787E-06
CS-134M	176.	127.42	1.3326E-07
CS-136	59.	818.50	2.1611E-08
CS-138	24.	1435.86	1.4776E-07
BA-133	126.	356.00	2.7293E-08
BA-139	102.	165.85	1.4319E-07
BA-140	74.	537.32	6.6593E-08
BA-141	156.	190.22	4.5779E-07
LA-140	12.	1596.49	1.7303E-08
CE-139	182.	165.85	1.6033E-08
CE-141	160.	145.44	2.5747E-08
CE-143	108.	293.26	8.4641E-08
CE-144	205.	133.54	1.2933E-07
ND-147	129.	91.11	4.9467E-08
EU-152	118.	344.27	5.8966E-08
EU-154	20.	1274.45	5.1110E-08
HF-181	**96.**	**482.03**	**2.1136E-08**
W-187	**98.**	**479.53**	**7.8050E-08**
HG-203	112.	279.19	1.8295E-08
RA-226	42.	609.31	5.0366E-08
TH-232	49.	2614.66	0.0000E+00
U-235	191.	185.72	2.4957E-08
U-238	215.	131.20	6.9583E-08
NP-239	156.	106.13	5.6167E-08
AM-241	105.	59.54	1.1573E-07