



Progress Energy

Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: ITS 5.7.1.1(b)

May 12, 2004
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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

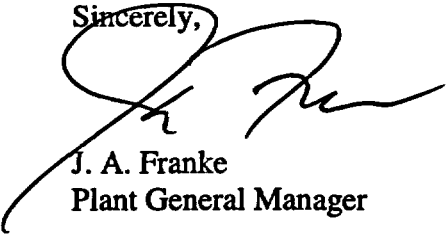
Subject: Crystal River Unit 3 – 2003 Annual Radiological Environmental Operating Report

Dear Sir:

Florida Power Corporation, doing business as Progress Energy Florida, Inc., hereby submits the 2002 Annual Radiological Environmental Operating Report for Crystal River Unit 3 (CR-3) in accordance with the CR-3 Improved Technical Specifications, Section 5.7.1.1(b) and Section 6.6 of the Offsite Dose Calculation Manual (ODCM). The data provided in the attached report is consistent with the objectives outlined in the ODCM, and includes all radiological environmental samples taken during the report period from January 1, 2003 through December 31, 2003.

If you have any questions regarding this submittal, please contact Mr. Sid Powell, Supervisor, Licensing and Regulatory Programs at (352) 563-4883.

Sincerely,



J. A. Franke
Plant General Manager

JAF/ff

Attachment

xc: NRR Project Manager
Regional Administrator, Region II
Senior Resident Inspector

Progress Energy Florida, Inc.
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Crystal River, FL 34428

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PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

2003

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INTRODUCTION

This report is submitted as required by Technical Specification 5.7.1.1(b) to the Crystal River Facility Operating License No. DPR-72, and Section 6.6 of the Offsite Dose Calculation Manual.

The following information is required to be included in this report:

- Data Summaries
- Interpretations
- Unachievable LLDs
- An analysis of trends
- An assessment of any observed impact of plant operation on the environment

NOTE: If harmful effects or evidence of irreversible damage are detected by the monitoring, the report shall provide an analysis of the problem and a planned course of action to correct it.

- Summarized and tabulated results of all radiological environmental samples taken during the report period, in the format of Radiological Assessment Branch Technical Position, Revision 1, November, 1979

NOTE: If some results are not available for inclusion, the report shall note and explain the reason for the missing results. The missing results shall be submitted as soon as possible in a supplementary report.

- A summary description of the Radiological Environmental Monitoring Program
- A map of all sampling locations keyed to a table giving distances and directions from the reactor
- Land-use census results
- Interlaboratory Comparison Program results

I. SUMMARY DESCRIPTION OF THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The analytical results of the Crystal River Unit 3 (CR-3) operational Radiological Environmental Monitoring Program (REMP) for 2003 are contained in this report. The operational program began on January 1, 1977 just prior to initial criticality, which was achieved on January 14, 1977.

Sampling of the facility environs is performed by the Florida Department of Health, Bureau of Radiation Control. The State also performs the required analyses, participates in the Interlaboratory Comparison Program, and performs the annual land-use census. Prior to 1990, the program was split between the Department of Health and the University of Florida. The transition to the State performing all of the programs sampling and analysis in 1990 is evident in several of the trend graphs, most notably oysters and carnivorous fish, and is due to the State using less sensitive measurement techniques for several of the pathways which were formerly evaluated by the University of Florida.

Sample station locations are given in Table I-1 and Figures I-2, -3, and -4. Sample frequency and analysis type may be determined from Table I-2. Figure I-1 illustrates the relevant exposure pathways.

Except for air sample gross beta results and direct radiation measurements, most of the analytical results are below the lower limit of detection (LLD) of the sample. Sample LLDs are generally much lower than the required "a priori" LLD. When measurable results are reported, the values are also usually less than the required "a priori" LLD.

The results of the 2003 REMP have been compared to previous years' results. This comparison, in part illustrated by the trend graphs of Section IV, shows no evidence of consistent long-term increasing trends in any of the sample media. However, radioactive material is routinely quantified in sediment samples which are taken in the discharge canal near the liquid release discharge point. In general, these results verify the effectiveness of in-plant measures for controlling radioactive releases.

Trend graphs illustrate the mean measured concentration of a particular radionuclide for the year. When measurable results are not obtained, the highest sample LLD is plotted. LLD and measured values are plotted on the same line to best illustrate any trend. As shown on each graph's key, shaded boxes indicate LLD values, while open boxes indicate measured values.

Statistical summary pages are provided for each medium or pathway. Measured values are reported in terms of a mean and range. In addition, the number of measured values versus samples obtained is reported. For example, the following entry

15 (249/256)
(4 - 35)

in the "All Indicator Locations" column would be interpreted as indicating a mean measured value of 15, with measured values ranging from 4 to 35. (249/256) means that out of 256 samples 249 were measured values.

TABLE I-1

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

SAMPLE STATION LOCATIONS

SAMPLE MEDIA	STATION ID	DIRECTION	DISTANCE
TLD	C60	N	4400 Ft.
	C61	NNE	4400
	C62	NE	5300
	C63	ENE	4400
	C64	E	4400
	C65	ESE	1740
	C66	SE	1600
	C67	SSE	1480
	C68	S	1500
	C69	SSW	1780
	C41	SW	2100
	C70	WSW	4400
	C71	WNW	3600
	C72	NW	2400
	C73	NNW	2000
	C27	W	3400
	C18	N	5.2 Mi.
	C03	NNE	5.3
	C04	NE	6.3
	C74	ENE	5.5
	C75	E	4.2
	C76	ESE	5.4
	C08	SE	3.5
	C77	SSE	3.2
	C09	S	3.2
	C78	WSW	4.1
	C14G	W	2.8
	C01	NW	4.9
	C79	NNW	5.0
	C47-Control	ESE	80
	C07*	ESE	7.5 Mi.
	C40*	E	3.5 Mi.
	C46*	N	2000 Ft.

*TLDs not required by ODCM. Deployed at air sample locations.

TABLE I-1 (CONT'D)
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

SAMPLE STATION LOCATIONS

SAMPLE MEDIA	STATION ID	DIRECTION	DISTANCE
AIR	C07	ESE	7.5 Mi.
	C18	N	5.2
	C40	E	3.5
	C41	SW	0.4
	C46	N	0.4
	C47-Control	ESE	78
SEAWATER	C14H	NW	0.1
	C14G	W	2.8
	C13-Control	WSW	3.4
GROUND WATER	C40-Control	E	3.5
DRINKING WATER	C07-Control	ESE	7.5
	C10-Control	ESE	5.9
	C18-Control	N	5.2
SHORELINE SEDIMENT	C09-Control	S	3.2
	C14H	NW	0.1
	C14M	W	1.2
	C14G	W	2.8
FISH & OYSTERS	C29	W	2.0
	C30-Control	WSW	3.6
BROAD LEAF VEGETATION	C48A	N	0.8
	C48B	NNE	0.8
	C47-Control	ESE	80
WATERMELON	C04	ENE	6.3
CITRUS	C19	ENE	8.5

TABLE I-2

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

SAMPLING AND ANALYSIS PROGRAM

SAMPLE MEDIA	# OF STATIONS	FREQUENCY	ANALYSIS		LLD ¹
TLD	33*	Quarterly	γ Dose		---
Air Iodine	6	Weekly	I-131		0.07 pCi/m ³
Air Particulate	6	Weekly	Gross β		0.01
		Quarterly	γ Spec :	Cs-134	0.05
				Cs-137	0.06
Seawater	3	Monthly	Tritium		3000 pCi/L
		Monthly	γ Spec :	Mn-54	15
				Fe-59	30
				Co-58	15
				Co-60	15
				Zn-65	30
				Zr-Nb-95	15
				I-131	1
				Cs-134	15
				Cs-137	18
				Ba-La-140	15
Ground Water	1	Semiannual	Tritium		2000 pCi/L
		Semiannual	γ Spec :	²	²
Drinking Water	3	Quarterly	Tritium		2000 pCi/L
		Quarterly	γ Spec :	²	²
Shoreline Sediment	4	Semiannual	γ Spec :	Cs-134	150 pCi/kg
				Cs-137	180

*Includes 3 stations which are not required by the ODCM

¹The maximum "a priori" LLD

²Same as Seawater γ Spec

³When available

⁴During harvest

⁵Same as broad leaf vegetation

TABLE I-2 (Cont'd)
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003
SAMPLING AND ANALYSIS PROGRAM

SAMPLE MEDIA	# OF STATIONS	FREQUENCY	ANALYSIS	LLD ¹
Carnivorous Fish and Oysters	2	Quarterly	γ Spec :	Mn-54 130 pCi/kg
				Fe-59 260
				Co-58 130
				Co-60 130
				Zn-65 260
				Cs-134 130
				Cs-137 150
Broad Leaf Vegetation	3	Monthly ³	γ Spec :	I-131 60 pCi/kg
				Cs-134 60
				Cs-137 80
Watermelon	1	Annual ⁴	γ Spec :	⁵ ⁵
Citrus	1	Annual ⁴	γ Spec :	⁵ ⁵

¹The maximum "a priori" LLD

²Same as Seawater γ Spec

³When available

⁴During harvest

⁵Same as broad leaf vegetation

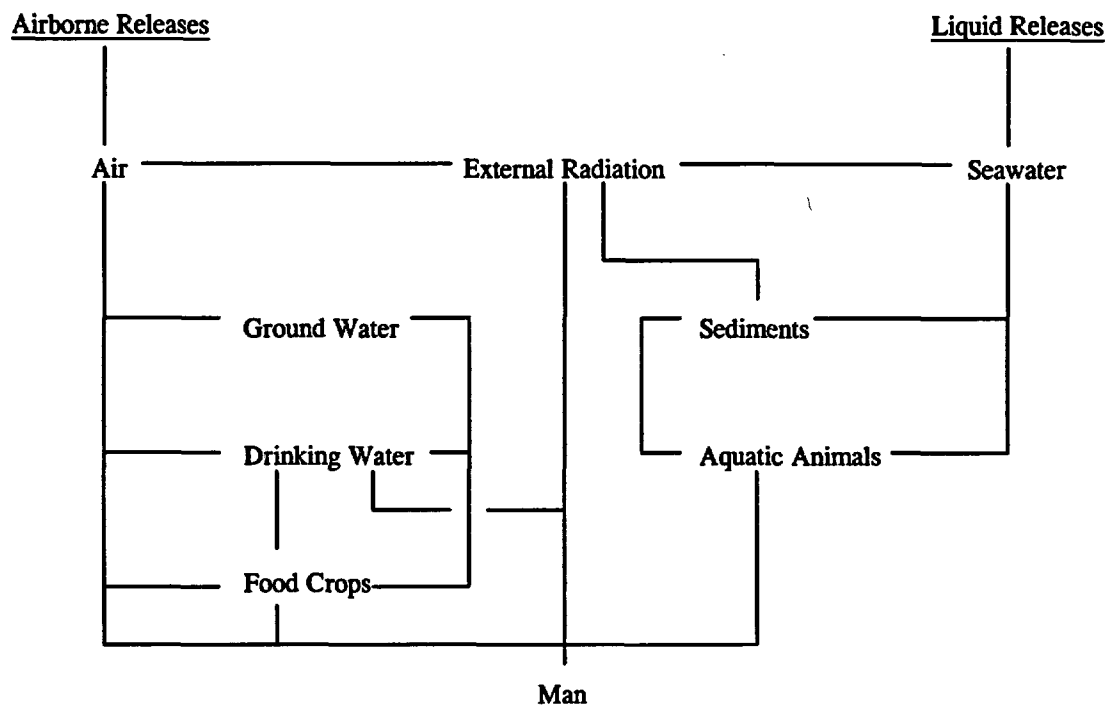


FIGURE I-1: Environmental Media and Exposure Pathways

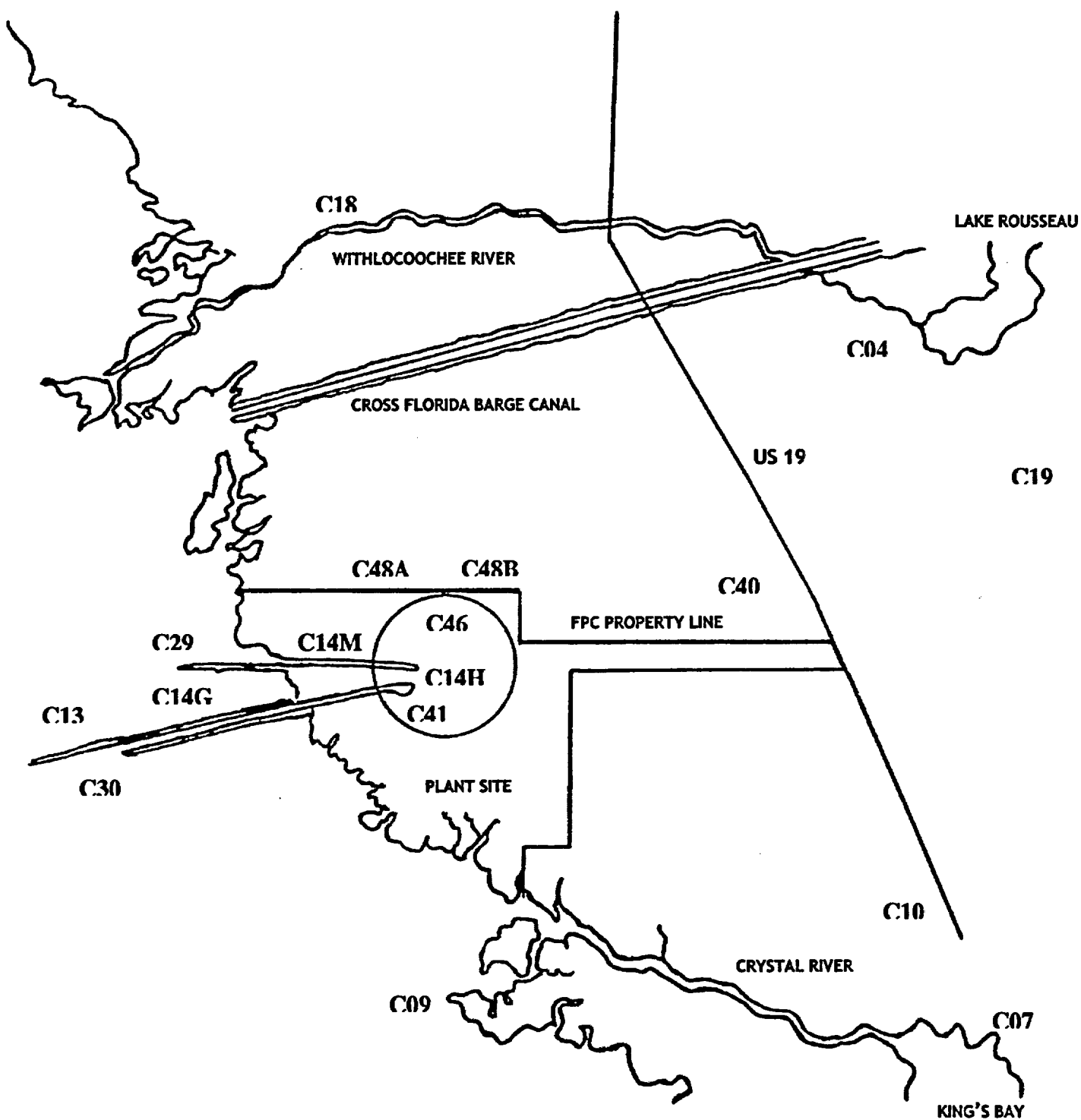


FIGURE I-2: Environmental Monitoring Sample Stations (non-TLDs)

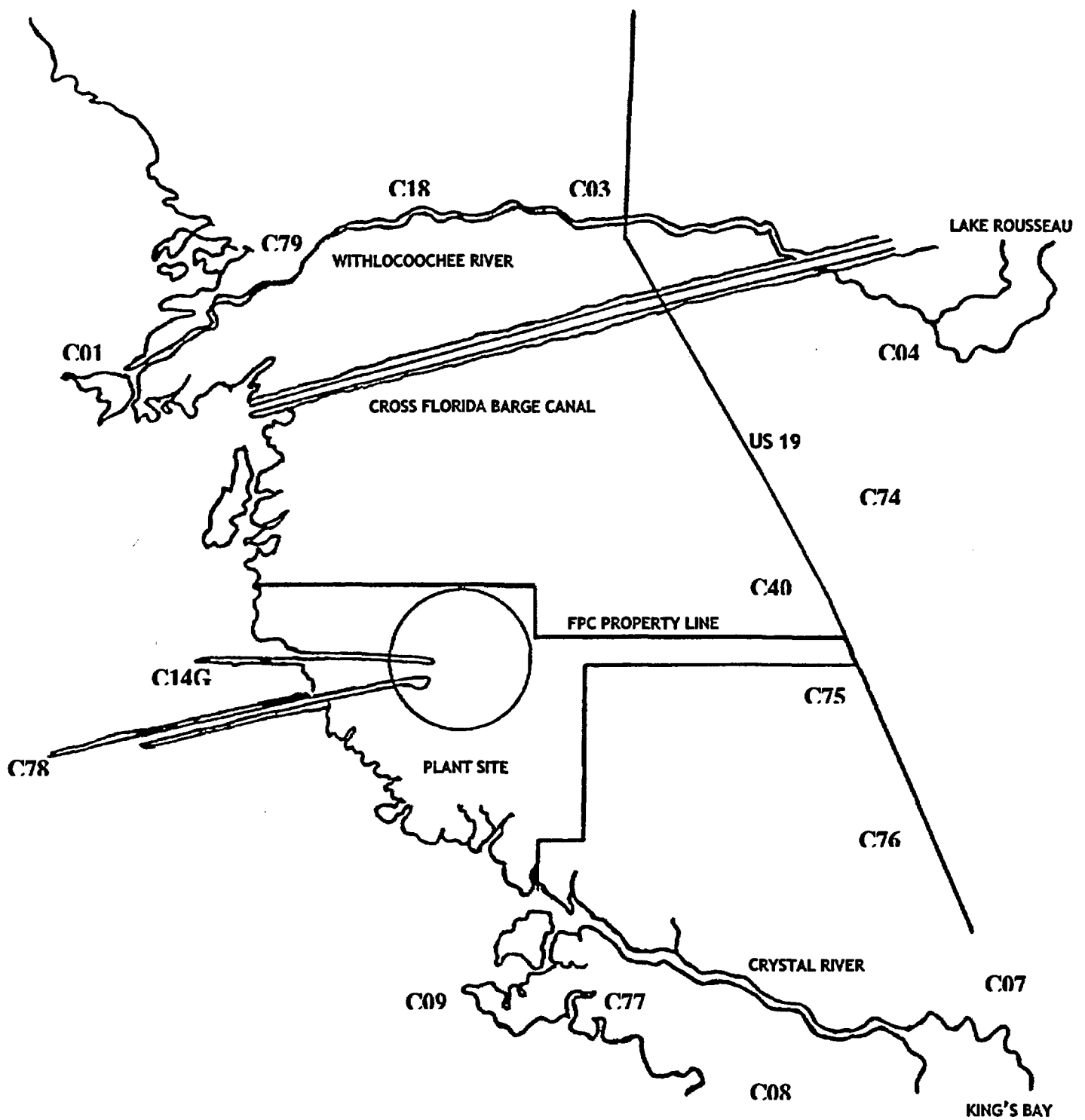


FIGURE I-4: Environmental Monitoring TLD Locations (off site)

II. LAND-USE CENSUS

A land-use census was conducted during July. The purpose of this census is to identify the nearest residences, vegetable gardens, and potential milk-producing animals within a five mile radius of the nuclear plant. The distance in miles and bearing in degrees for each receptor type in each of the sixteen sectors is summarized below.

SECTOR	NEAREST RESIDENCE	NEAREST GARDEN	NEAREST MILK ANIMAL
N	4.46 @ 2°	4.77 @ 2°	*
NNE	3.95 @ 15°	4.88 @ 17°	*
NE	3.84 @ 54°	*	*
ENE	3.43 @ 60°	4.95 @ 62°	*
E	2.40 @ 92°	*	*
ESE	4.24 @ 102°		*
SE	4.90 @ 133°	*	*
SSE	3.53 @ 149°	*	*
S	*	*	*
SSW	*	*	*
SW	*	*	*
WSW	*	*	*
W	*	*	*
WNW	*	*	*
NW	4.77 @ 323°	*	*
NNW	4.60 @ 339°	*	*

* No suitable sites were located within 5 miles.

FLORIDA DEPARTMENT OF HEALTH - INTERLABORATORY COMPARISON PROGRAM DATA

The EPA crosscheck program ceased operation at the end of 1998. To meet the requirements for a crosscheck program, the Florida Department of Health participates in the Department of Energy's Environmental Measurements Laboratory (EML) Quality Assessment Program. As of March 2003, EML transferred to the Department of Homeland Security.

The following units are used for each of the four media:

Air Filters: Bq/filter
 Soil: Bq/kg
 Vegetation: Bq/kg
 Water: Bq/L

Analytical performance is based on historical analytical capabilities for individual analyte/matrix pairs.

Acceptable performance is designated by an "A".

Acceptable with warning is designated by a "W".

Performance which is not acceptable is designated by an "N".

Results for June 2003:

Media	Nuclide	Reported Value	Reported Error	EML Value	EML Error	Reported/EML	Evaluation
Air	Co-60	34.53	0.150	33.50	0.870	1.031	A
Air	Cs-137	109.35	0.200	99.70	2.300	1.097	A
Air	Gross Beta	1.660	0.040	1.500	0.150	1.107	A
Soil	Cs-137	1491.00	3.00	1450.0	73.00	1.028	A
Soil	K-40	661.0	8.00	636.00	33.00	1.039	A
Vegetation	Co-60	13.500	0.600	12.100	0.700	1.116	A
Vegetation	Cs-137	497.00	2.000	444.00	22.000	1.119	A
Vegetation	K-40	1254.00	20.00	1120.0	60.000	1.120	A
Water	Co-60	233.400	0.580	234.00	8.400	0.997	A
Water	Cs-137	64.260	0.480	63.800	3.400	1.007	A
Water	H-3	421.310	6.100	390.00	3.400	1.080	A

Results for September 2003:

Media	Nuclide	Reported Value	Reported Error	EML Value	EML Error	Reported/EML	Evaluation
Air	Co-60	56.43	0.2	55.1	1.1	1.024	A
Air	Cs-137	59.5	0.2	54.8	1.1	1.086	A
Air	Gross Beta	4.47	0.06	3.89	0.39	1.149	A
Soil	Cs-137	1671.0	3.00	1973.0	99.0	0.847	W
Soil	K-40	420.0	7.0	488.0	26.0	0.861	W
Water	Co-60	488.9	1.1	513.0	18.0	0.953	A
Water	Cs-137	78.92	0.64	80.3	4.1	0.983	A
Water	H-3	492.57	6.47	446.3	2.2	1.104	A

The lab was not provided vegetation samples by the Environmental Measurements lab for this second set of QA samples.

The "warning" indication for the soil samples was attributed to an error on the part of a Florida Dept of Health analyst in determining the volume of the sample. The Dept. of Health Environmental Manager counseled the analyst on the need to follow the data verification procedure. Corrected values of 2059 and 509 for Cs-137 and K-40 are much closer to the EML value and would likely have been reported as acceptable.

IV-A. AIRBORNE PATHWAY

Air samples are taken at five locations in the vicinity of the plant. The control location is 78 miles ESE of the plant, at the State Bureau of Radiation Control in Orlando.

Table IV-A.1 provides a statistical summary of the analytical results for 312 gross beta samples and 312 iodine samples.

Tables IV-A.2 and IV-A.3 provide the results for each weekly air sample.

Of 312 particulate samples analyzed for gross beta activity, 310 had measurable activity. The average indicator concentration was 15 pCi/1000 m³ with a range of 4 to 32 pCi/1000 m³. The average indicator concentration for 1996 through 2001 was 15 pCi/1000 m³, and 17 pCi/1000 m³ for 2002. The control location concentration for 2003 averaged 15 pCi/1000 m³, with a range of 4 to 29 pCi/1000 m³.

Three hundred and twelve samples were analyzed for iodine activity, with none having measurable activity.

Quarterly composite data are summarized in Table IV-A.4. Measurable quantities of cesium were not identified. The highest cesium LLD was 1.9 pCi/1000 m³ for cesium 134.

The gross beta LLD of 0.01 pCi/m³ and Iodine 131 LLD of 0.07 pCi/m³ were not attained for air sample station C40 and C47 as complete samples were not obtained for several sampling periods as listed below. Station C47 is the control station in Orlando.

C47: 7/21 to 7/29 Run time of approx. 73 of 191.8 hours due to loss of power.

C47: 7/29 to 8/5 Run time of approx. 135 of 167 hours due to failed sample pump.

C40: 8/11 to 8/19 Run time of approx. 37 hours of 191.8 hours due to loss of power.

C40: 8/19 to 8/26 Run time of approx. 125 hours out of 169.5 hours due to power outage.

TABLE IV-A.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
AIRBORNE IODINE (pCi/m ³)	γ Spec 312 I-131	0.012	<LLD	-	-	<LLD	0
AIRBORNE PARTICULATES (pCi/1000m ³ for Gross β, pCi/1000m ³ for γ Spec)	Gross β 312 γ Spec 24 Cs-134 Cs-137	6.4	15 (258/260) (4 - 32)	C46 0.37 @ 357°	15 (52/52) (5 - 32)	18 (52/52) (4 - 29)	0
		0.8	<LLD	-	-	<LLD	0
		0.8	<LLD	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-A.2

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
01-07	<.01	<.01	<.03	<.01	<.01	<.01
01-13	<.02	<.02	<.02	<.02	<.02	<.02
01-21	<.02	<.02	<.02	<.02	<.02	<.02
01-27	<.02	<.02	<.02	<.02	<.02	<.02
02-03	<.03	<.03	<.03	<.03	<.03	<.03
02-11	<.01	<.01	<.01	<.01	<.01	<.01
02-17	<.02	<.03	<.03	<.03	<.03	<.03
02-25	<.02	<.02	<.02	<.02	<.02	<.02
03-04	<.01	<.01	<.01	<.01	<.01	<.01
03-11	<.03	<.02	<.02	<.02	<.02	<.03
03-17	<.03	<.03	<.03	<.03	<.04	<.03
03-25	<.02	<.02	<.02	<.02	<.02	<.02
04-01	<.01	<.01	<.01	<.01	<.01	<.01
04-08	<.03	<.03	<.03	<.03	<.03	<.03
04-15	<.01	<.01	<.01	<.01	<.01	<.01
04-22	<.02	<.02	<.02	<.02	<.02	<.02
04-29	<.02	<.02	<.02	<.02	<.02	<.02

TABLE IV-A.2 (Cont'd)
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
05-06	<.01	<.01	<.01	<.01	<.01	<.01
05-13	<.01	<.01	<.01	<.01	<.01	<.01
05-19	<.02	<.02	<.02	<.02	<.03	<.02
05-27	<.01	<.01	<.01	<.01	<.02	<.01
06-03	<.02	<.02	<.02	<.02	<.02	<.02
06-10	<.01	<.01	<.01	<.01	<.01	<.01
06-17	<.02	<.01	<.02	<.02	<.02	<.01
06-24	<.02	<.02	<.02	<.02	<.02	<.02
07-01	<.04	<.04	<.04	<.04	<.04	<.04
07-08	<.01	<.01	<.01	<.01	<.01	<.01
07-15	<.01	<.02	<.01	<.01	<.01	<.01
07-21	<.02	<.02	<.02	<.02	<.02	<.02
07-29	<.03	<.03	<.03	<.03	<.03	<.03
08-05	<.01	<.01	<.01	<.01	<.01	<.02
08-11	<.02	<.02	<.02	<.02	<.02	<.02
08-19	<.01	<.01	<.02	<.01	<.01	<.01
08-26	<.01	<.01	<.02	<.01	<.01	<.01

TABLE IV-A.2 (Cont'd)
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
09-02	<.01	<.01	<.01	<.01	<.01	<.01
09-09	<.02	<.02	<.02	<.02	<.02	<.02
09-16	<.02	<.02	<.02	<.02	<.02	<.02
09-23	<.01	<.01	<.01	<.01	<.01	<.01
09-30	<.01	<.01	<.01	<.01	<.01	<.01
10-07	<.02	<.02	<.02	<.02	<.02	<.02
10-13	<.02	<.02	<.02	<.02	<.02	<.02
10-21	<.02	<.02	<.02	<.02	<.02	<.02
10-28	<.01	<.01	<.01	<.01	<.01	<.01
11-05	<.01	<.01	<.01	<.01	<.01	<.01
11-12	<.01	<.01	<.01	<.01	<.01	<.01
11-19	<.01	<.01	<.01	<.01	<.01	<.01
11-25	<.01	<.01	<.01	<.01	<.01	<.01
12-02	<.02	<.02	<.02	<.02	<.02	<.02
12-10	<.02	<.02	<.05	<.02	<.02	<.02
12-16	<.02	<.02	<.02	<.02	<.02	<.02
12-23	<.01	<.01	<.01	<.01	<.01	<.01
12-30	<.01	<.01	<.01	<.01	<.01	<.01

TABLE IV-A.3

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/1000m³ GROSS β IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
01-07	17	24	20	19	24	26
01-13	27	20	21	21	22	23
01-21	23	26	27	27	32	29
01-27	14	20	21	16	22	20
02-03	21	22	20	21	19	17
02-11	7	19	16	21	18	13
02-17	20	19	16	20	20	20
02-25	11	14	10	12	13	16
03-04	10	7	9	8	9	12
03-11	11	11	6	10	12	10
03-17	17	15	15	9	18	13
03-25	20	19	13	16	19	17
04-01	13	14	13	12	17	17
04-08	15	13	15	14	15	19
04-15	17	19	13	14	17	20
04-22	15	21	15	16	21	15
04-29	12	16	7	13	12	18

TABLE IV-A.3 (Cont'd)
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/1000m³ GROSS β IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
05-06	19	16	16	18	19	20
05-13	16	13	10	13	19	20
05-19	17	18	18	16	16	17
05-27	11	12	6	9	13	12
06-03	22	25	17	18	25	25
06-10	13	10	7	18	12	9
06-17	8	10	8	9	12	12
06-24	4	6	6	6	5	8
07-01	10	12	17	16	11	18
07-08	12	15	10	16	12	11
07-15	9	8	7	7	10	11
07-21	12	10	9	10	13	15
07-29	7	9	8	8	8	12
08-05	<5	9	8	10	9	8
08-11	15	10	6	10	5	8
08-19	10	9	8	7	7	8
08-26	7	7	6	<7	6	4

TABLE IV-A.3 (Cont'd)
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/1000m³ GROSS B IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
09-02	11	11	10	13	9	10
09-09	8	8	6	10	7	9
09-16	15	14	12	13	17	12
09-23	24	24	19	19	17	20
09-30	11	10	9	11	8	13
10-07	21	24	17	20	25	18
10-13	9	17	20	20	21	16
10-21	13	14	18	13	13	18
10-28	22	32	31	28	24	23
11-05	16	14	17	17	15	17
11-12	12	12	11	6	12	4
11-19	17	17	15	18	17	17
11-25	13	15	20	16	19	17
12-02	23	18	20	15	17	13
12-10	19	22	31	19	18	17
12-16	17	23	26	17	25	20
12-23	19	22	23	18	21	21
12-30	17	18	18	15	18	21

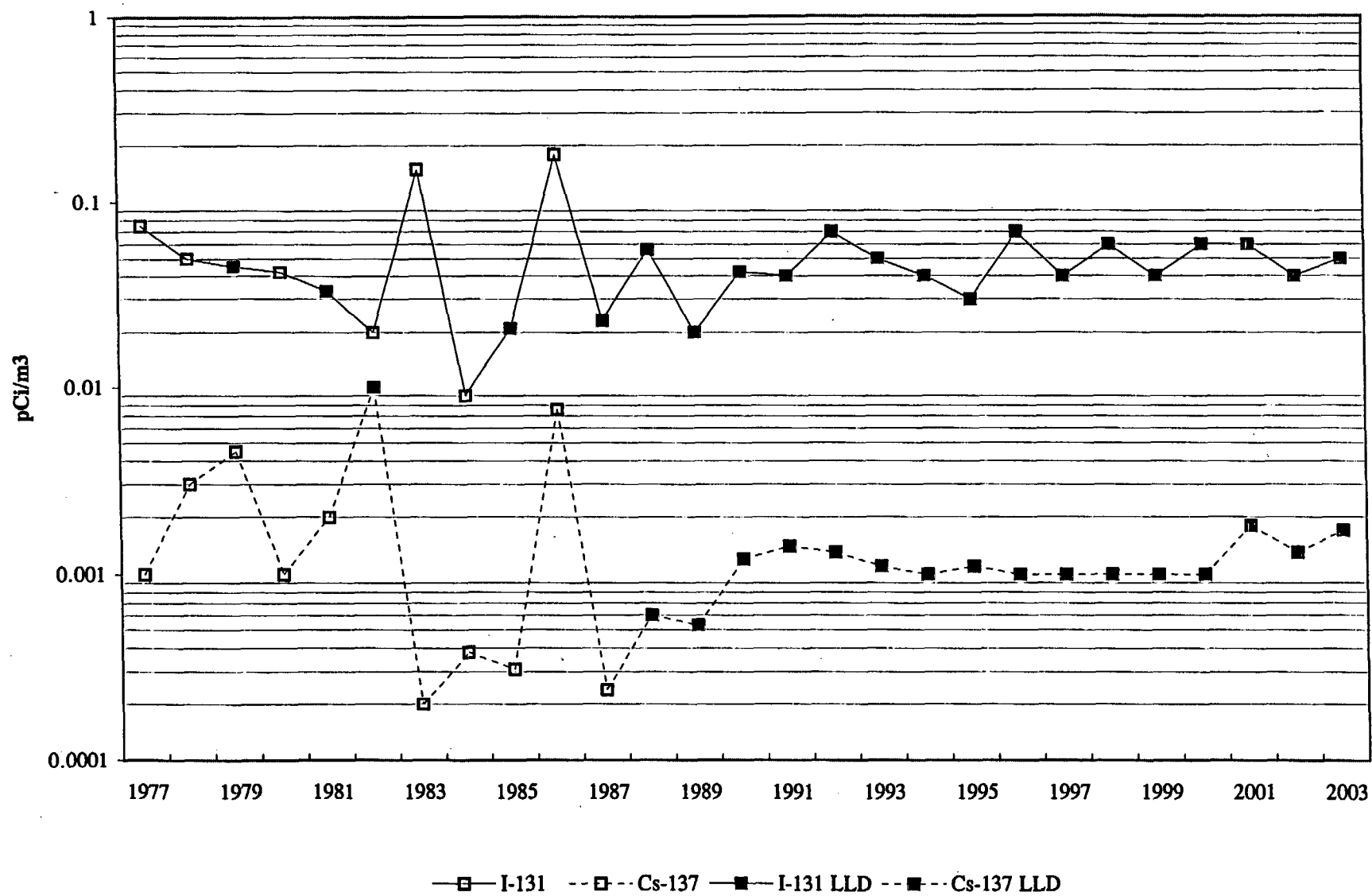
TABLE IV-A.4

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/1000m³ γ EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATES

STATION	NUCLIDE	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
C07	Be-7	121	129	109	127
	K-40	<18	<34	<28	<25
	Cs-134	<1.0	<1.6	<1.4	<1.4
	Cs-137	<1.0	<1.3	<1.5	<1.2
C18	Be-7	123	113	126	141
	K-40	<30	<31	<30	<20
	Cs-134	<1.4	<1.4	<1.4	<1.0
	Cs-137	<1.7	<1.5	<1.3	<0.9
C40	Be-7	116	123	91	127
	K-40	<22	<26	<18	<20
	Cs-134	<1.2	<1.8	<1.0	<1.4
	Cs-137	<1.2	<1.6	<0.9	<1.2
C41	Be-7	122	128	87	126
	K-40	<30	<27	<18	<15
	Cs-134	<1.8	<1.8	<1.2	<0.7
	Cs-137	<1.4	<1.4	<0.9	<0.7
C46	Be-7	136	143	96	140
	K-40	<20	<37	<35	8
	Cs-134	<0.9	<1.8	<1.9	<0.8
	Cs-137	<1.2	<1.5	<1.6	<0.7
C47	Be-7	150	151	123	154
	K-40	<30	<28	<21	<20
	Cs-134	<1.5	<1.5	<0.5	<1.4
	Cs-137	<1.5	<1.7	<1.1	<1.0

Airborne



IV-B. DIRECT RADIATION

Direct radiation measurements (using TLDs) were taken at seventeen locations (stations C60 through C73 and station C27) within one mile of the plant, at fifteen locations ranging from 2.8 to 6.3 miles from the plant, and at one control location 78 miles from the site. One-hundred and thirty-two TLDS were collected during 2003.

The highest on-site dose was 117 mrem/yr at station C71 (WNW at 3600 feet). Station C71 was relocated in 1992 due to construction of the helper cooling towers on the former site. The new location has a higher background radiation level due to being closer to the storage pond for Units 4 & 5 fly ash, which produces a higher external radiation component than normal levels of natural background. The second highest on-site dose was 82 mrem/yr at station C65 (ESE at 1740 feet).

The highest off-site dose was 61 mrem/yr at station C40 (east at 3.5 miles). The control station (C47) dose was 49 mrem/yr. The average for all stations (except control) was 58 mrem/yr for 2003 and 59 mrem/yr for 2002. Direct radiation results are similar to previous years and show no change of significance.

TABLE IV-B

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
DIRECT RADIATION (mrem/yr)	γ DOSE 132	15	58 (128/128) (35 - 124)	C71 0.6 @ 296°	117 (4/4) (110 - 124)	49 (4/4) (45 - 53)	0

TABLE IV-B.1

PROGRESS ENERGY FLORIDA, INC. - CR-3 - 2003

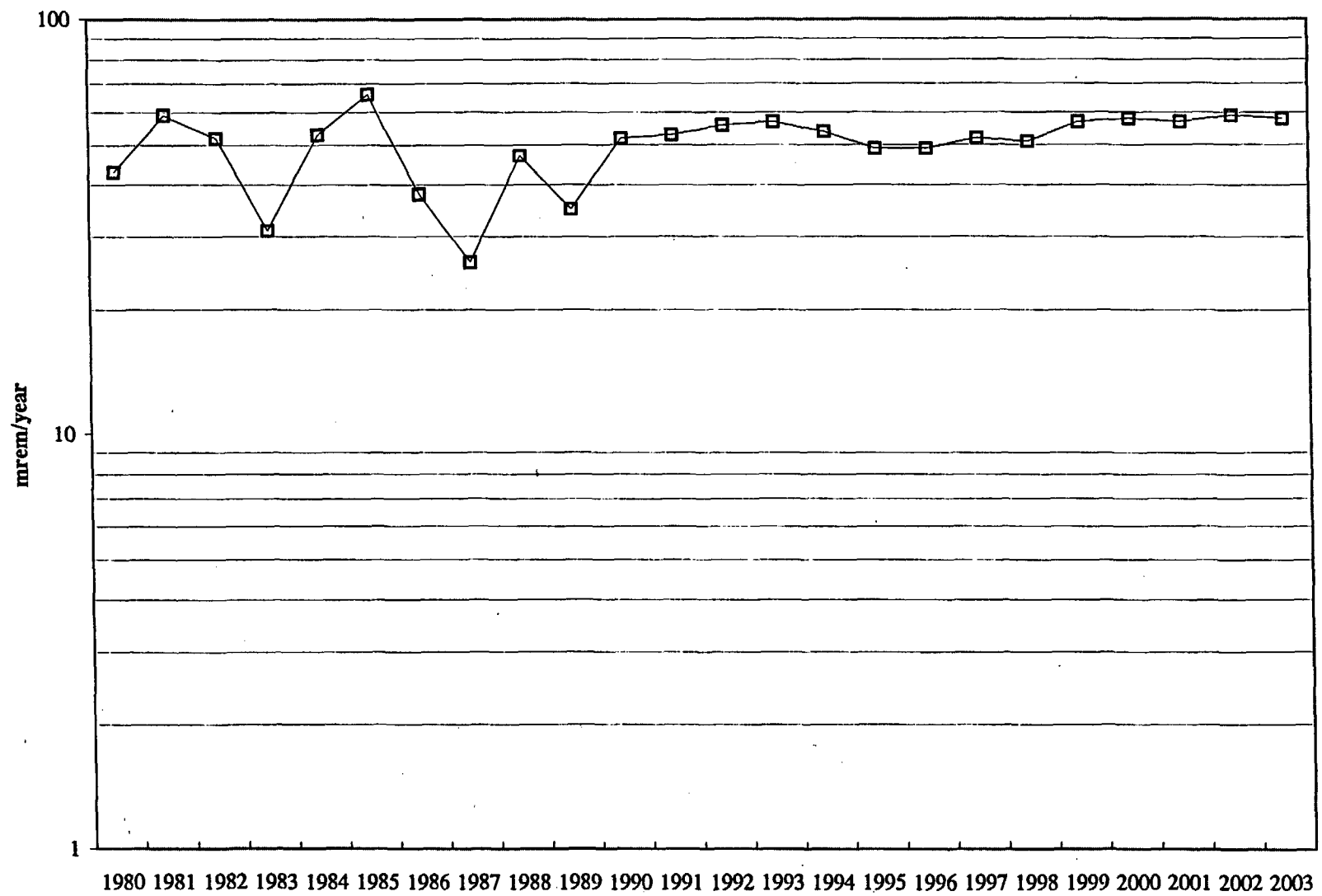
mrem/yr γ Dose

TLD STATION	Quarter	1	2	3	4
CO1		46	46	43	43
CO3		48	45	40	42
CO4		46	46	40	41
CO7*		44	45	40	40
CO8		46	43	39	39
CO9		44	43	39	40
C14G		54	54	53	53
C18		49	47	48	47
C27		67	67	66	61
C40*		64	60	60	57
C41		61	58	57	50
C46*		59	56	55	50
C47 (CONTROL)		53	48	49	45
C60		62	56	53	47
C61		65	61	57	56
C62		70	64	62	61
C63		59	60	58	56
C64		62	60	58	53
C65		84	83	81	80
C66		64	63	59	58
C67		63	59	58	55
C68		63	59	57	58
C69		64	60	54	57
C70		70	63	58	61
C71		124	116	120	110
C72		65	66	63	62
C73		57	53	52	47
C74		46	42	39	39
C75		58	57	53	48
C76		54	50	49	46
C77		40	38	37	35
C78		48	45	45	41
C79		50	48	46	46

*TLDs not required by the ODCM.

Quarterly values are multiplied by 4 to obtain an equivalent yearly dose.

Direct Radiation



IV-C. WATERBORNE PATHWAY

To evaluate the waterborne pathway, samples are taken of seawater, ground water, drinking water, and shoreline sediment.

1. Monthly seawater grab samples are taken at two locations in the discharge canal (C14G and C14H) and at one control location (C13) near the mouth of the intake canal. Of twenty-four indicator samples, ten had measurable tritium at an average concentration of 778 pCi/L. The sample with the highest concentration of tritium, 4071 pCi/L, was obtained in April at station C14H near the head of the discharge canal. The seawater tritium activity is consistent with the concentration of tritium in the liquid waste stream. Two control station samples contained tritium at an average concentration of 91 pCi/L.

Gamma spectral analysis was performed on thirty-six samples, none of which showed measurable amounts of the gamma emitters of interest.

2. Semiannual ground water samples are taken at one location, station C40, located approximately 3.5 miles east of CR-3. Gamma spectral and tritium analyses are performed on both samples. All results were less than the detection limits. Since plant startup, all results, except for the results of one 1985 tritium analysis, have been less than LLD. The required sensitivity for measuring tritium in ground water is 2000 pCi/L. Analysis of ground water in the vicinity of CR-3 is done at a sensitivity of approximately 130 pCi/L for tritium and less than 10 pCi/L for select gamma emitters.
3. Quarterly drinking water samples are drawn from three locations: the Crystal River City Hall (C07), the Days Inn Motel (C10), and the Yankeetown City Well (C18). All samples were collected and analyzed for gamma emitters and tritium. None of the samples yielded measurable activities of tritium or the required gamma emitters. The measurement sensitivity for drinking water samples are the same as those for ground water samples.
4. Semiannual shoreline sediment samples are taken at three indicator locations in the discharge canal (C14H, C14M, C14G) and one control location (C09) at Fort Island Gulf Beach. Of the six indicator samples, three had measurable amounts of cobalt-60 or cesium-137. The average cobalt-60 concentration at the indicator locations was 126 pCi/L for 2003, as compared to 54 pCi/L for 2002, 30 pCi/L for 2001, 98 pCi/L for 2000, 118 pCi/L for 1999, and 389 pCi/L for 1998. The average cesium-137 concentration at the indicator locations was 37 pCi/L for 2003, as compared to 53 pCi/L for 2002, 28 pCi/L for 2001, 49 pCi/L for 2000 and 65 pCi/L for 1999. None of the samples taken at Fort Island Gulf Beach, the control location, indicated measurable amounts of cobalt or cesium. These results are similar to previous years' results.

TABLE IV-C.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
SEAWATER (pCi/L)	Tritium 36	131	778 (10/24) (65-4071)	C14H 0.12 @ 325°	923 (5/12) (110-4071)	91 (2/12)	0
	γ Spec 36						
	Mn-54	3	<LLD	-	-	<LLD	0
	Fe-59	6	<LLD	-	-	<LLD	0
	Co-58	3	<LLD	-	-	<LLD	0
	Co-60	4	<LLD	-	-	<LLD	0
	Zn-65	7	<LLD	-	-	<LLD	0
	Zr-Nb-95	6	<LLD	-	-	<LLD	0
	I-131	4	<LLD	-	-	<LLD	0
	Cs-134	4	<LLD	-	-	<LLD	0
	Cs-137	4	<LLD	-	-	<LLD	0
	Ba-La-140	9	<LLD	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-C.1.a

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/L γ EMITTERS AND TRITIUM IN SEAWATER

STATION	MONTH	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-Nb-95	I-131	Cs-134	Cs-137	Ba-La-140
C13	JAN	<129	235 \pm 29	<3	<4	<7	<5	<9	<6	<4	<3	<4	<7
	FEB	<129	230 \pm 29	<4	<3	<8	<4	<7	<6	<6	<4	<4	<5
	MAR	<127	219 \pm 46	<6	<5	<11	<6	<10	<9	<6	<6	<6	<12
	APR	95 \pm 39	212 \pm 16	<2	<2	<4	<2	<4	<3	<5	<2	<2	<4
	MAY	87 \pm 39	198 \pm 39	<7	<6	<14	<6	<11	<11	<6	<6	<5	<13
	JUN	<122	201 \pm 33	<3	<4	<7	<5	<6	<6	<4	<4	<3	<8
	JUL	<115	179 \pm 36	<4	<5	<9	<6	<9	<8	<5	<5	<4	<9
	AUG	<121	242 \pm 32	<3	<3	<6	<4	<8	<6	<5	<4	<3	<9
	SEP	<117	210 \pm 31	<3	<3	<7	<4	<7	<6	<4	<4	<3	<7
	OCT	<120	239 \pm 32	<3	<4	<8	<4	<7	<6	<5	<4	<4	<7
	NOV	<126	281 \pm 31	<3	<4	<7	<4	<8	<6	<5	<5	<4	<7
	DEC	<114	270 \pm 45	<5	<5	<13	<6	<11	<12	<6	<7	<5	<14
C14G	JAN	<126	182 \pm 40	<7	<6	<14	<6	<12	<12	<7	<7	<5	<12
	FEB	<129	149 \pm 43	<5	<6	<13	<7	<15	<11	<9	<6	<6	<6
	MAR	759 \pm 32	223 \pm 31	<3	<3	<6	<3	<8	<5	<4	<3	<4	<8
	APR	1497 \pm 65	185 \pm 35	<6	<5	<12	<6	<12	<10	<10	<6	<6	<11
	MAY	673 \pm 30	233 \pm 39	<6	<5	<11	<7	<13	<10	<6	<7	<5	<13
	JUN	<122	192 \pm 40	<5	<5	<11	<7	<13	<10	<6	<6	<7	<14
	JUL	172 \pm 23	221 \pm 21	<2	<3	<5	<3	<5	<5	<3	<3	<2	<5
	AUG	<121	249 \pm 30	<4	<4	<8	<3	<8	<8	<6	<4	<4	<7
	SEP	<117	250 \pm 21	<3	<3	<4	<3	<5	<4	<3	<3	<2	<4
	OCT	<120	236 \pm 30	<3	<4	<7	<4	<8	<6	<4	<4	<4	<9
	NOV	<126	172 \pm 25	<4	<3	<7	<4	<7	<7	<4	<3	<4	<5
	DEC	65 \pm 21	230 \pm 30	<4	<4	<6	<4	<8	<7	<5	<3	<3	<9

TABLE IV-C.1a (CONT'D)
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003
pCi/L γ EMITTERS AND TRITIUM IN SEAWATER

STATION	MONTH	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-Nb-95	I-131	Cs-134	Cs-137	Ba-La-140
C14H	JAN	<129	212 \pm 28	<4	<3	<7	<4	<7	<7	<4	<5	<3	<6
	FEB	<129	211 \pm 43	<6	<6	<10	<6	<8	<9	<10	<7	<6	<10
	MAR	86 \pm 41	213 \pm 44	<5	<5	<13	<8	<13	<11	<7	<7	<5	<11
	APR	4071 \pm 96	282 \pm 29	<3	<4	<7	<3	<9	<6	<7	<3	<4	<4
	MAY	110 \pm 23	232 \pm 27	<3	<4	<6	<3	<8	<5	<5	<4	<3	<8
	JUN	<122	200 \pm 16	<2	<2	<4	<2	<4	<3	<6	<2	<2	<3
	JUL	<115	194 \pm 38	<4	<4	<9	<4	<10	<8	<5	<5	<5	<11
	AUG	129 \pm 23	194 \pm 5	<3	<4	<7	<4	<8	<6	<4	<3	<4	<9
	SEP	219 \pm 24	251 \pm 23	<3	<2	<5	<3	<5	<4	<3	<3	<2	<5
	OCT	<120	234 \pm 40	<6	<5	<13	<8	<12	<10	<7	<6	<6	<13
	NOV	<126	254 \pm 27	<4	<4	<8	<4	<9	<6	<5	<4	<4	<6
	DEC	<114	279 \pm 32	<3	<3	<8	<4	<7	<7	<4	<4	<4	<6

Seawater

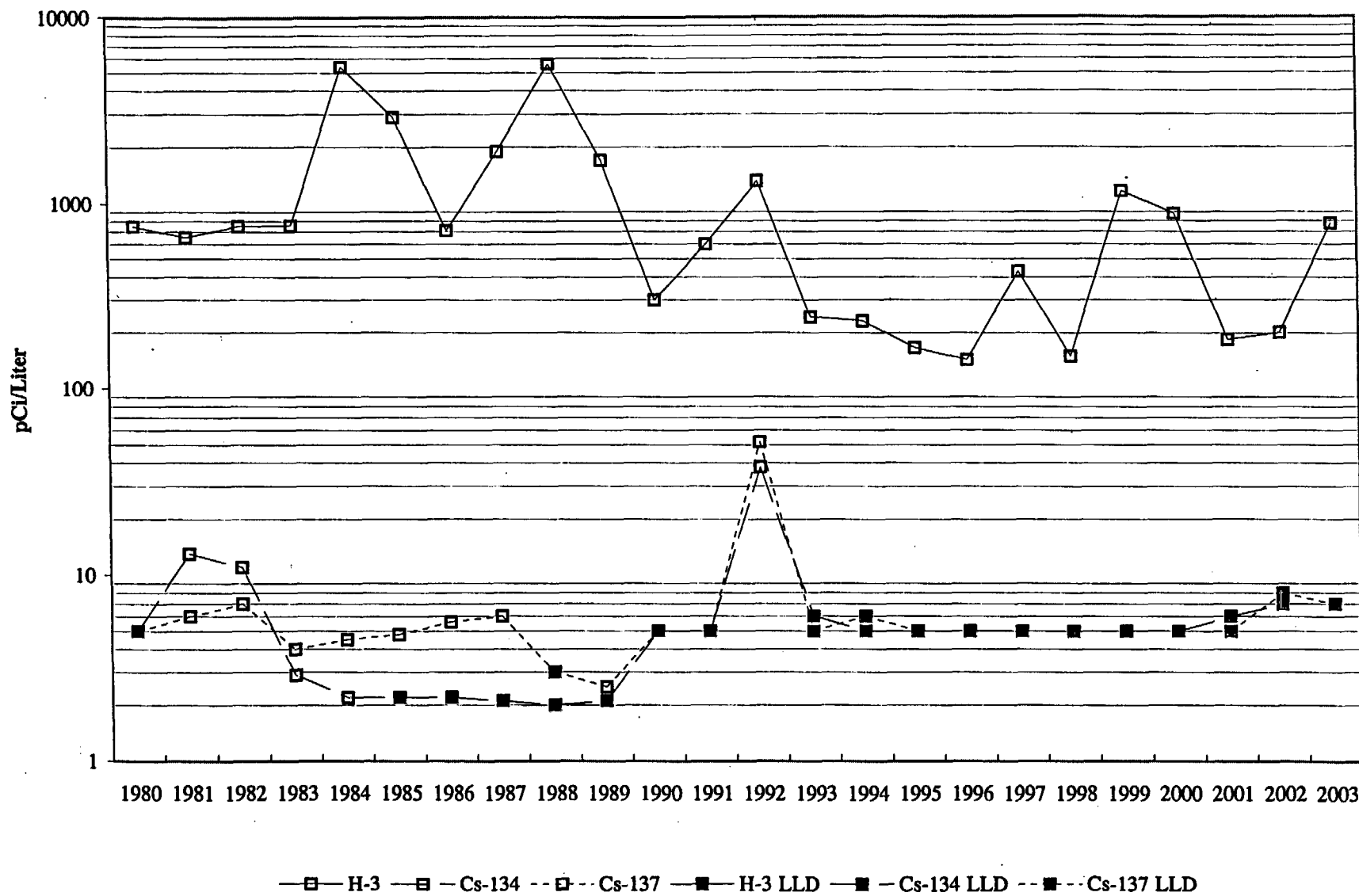


TABLE IV-C.2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
GROUND WATER (pCi/L)	Tritium 2	131	None	-	-	<LLD	0
	γ Spec 2						
	Mn-54	3	None	-	-	<LLD	0
	Fe-59	6	None	-	-	<LLD	0
	Co-58	3	None	-	-	<LLD	0
	Co-60	4	None	-	-	<LLD	0
	Zn-65	7	None	-	-	<LLD	0
	Zr-Nb-95	6	None	-	-	<LLD	0
	I-131	4	None	-	-	<LLD	0
	Cs-134	4	None	-	-	<LLD	0
	Cs-137	4	None	-	-	<LLD	0
	Ba-La-140	9	None	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-C.2.a

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/L γ EMITTERS AND TRITIUM IN GROUND WATER

STATION	NUCLIDE	FIRST HALF	SECOND HALF
C40	H-3	<129	<117
	Mn-54	<4	<4
	Fe-59	<7	<6
	Co-58	<4	<4
	Co-60	<5	<4
	Zn-65	<8	<9
	Zr-Nb-95	<6	<7
	I-131	<5	<5
	Cs-134	<4	<4
	Cs-137	<4	<4
	Ba-La-140	<5	<7
	K-40	<59	<56

Ground Water

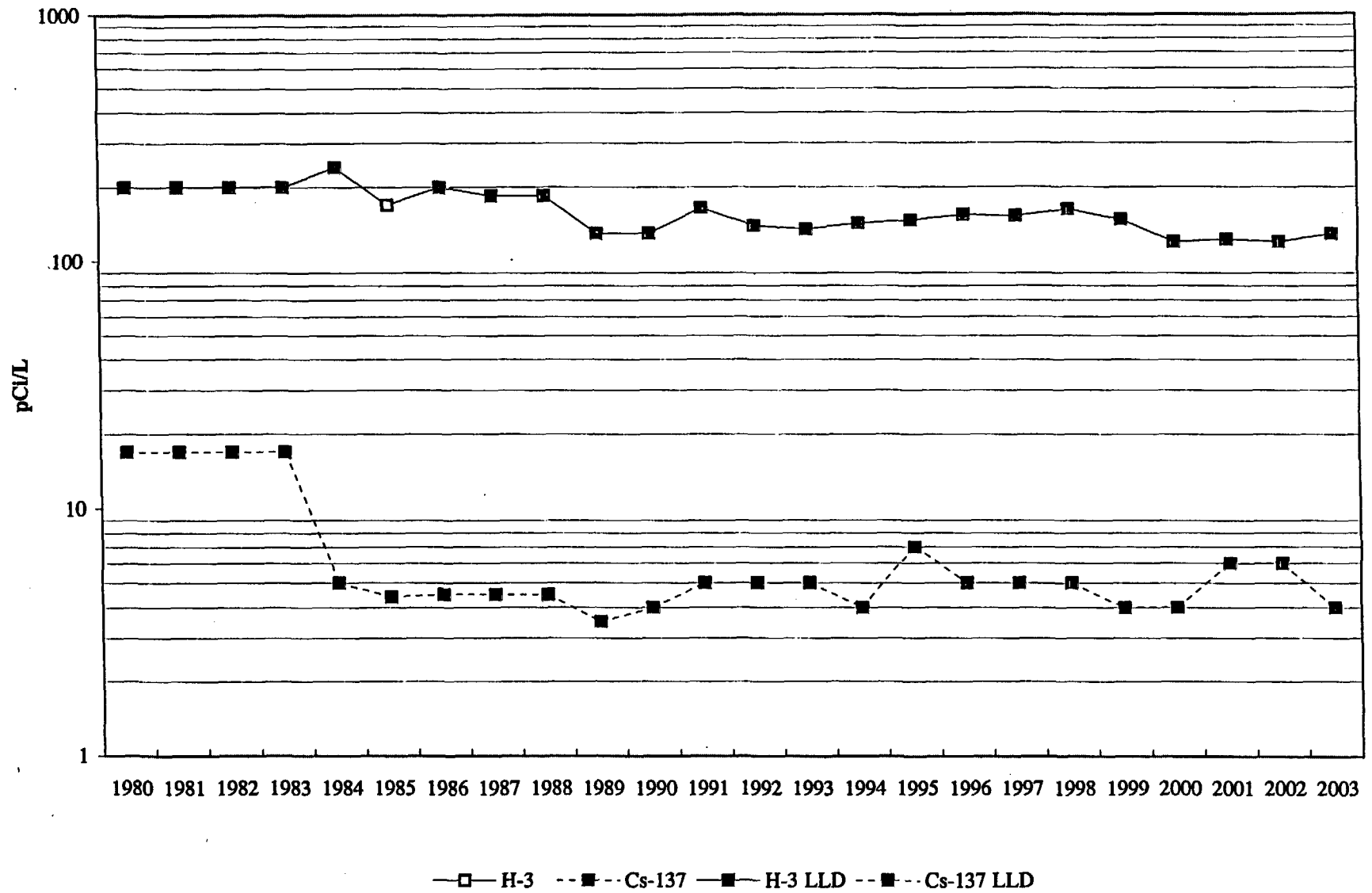


TABLE IV-C.3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
DRINKING WATER (pCi/L)	Tritium 12	131	None	-	-	<LLD	0
	γ Spec 12						
	Mn-54	3	None	-	-	<LLD	0
	Fe-59	6	None	-	-	<LLD	0
	Co-58	3	None	-	-	<LLD	0
	Co-60	4	None	-	-	<LLD	0
	Zn-65	7	None	-	-	<LLD	0
	Zr-Nb-95	6	None	-	-	<LLD	0
	I-131	4	None	-	-	<LLD	0
	Cs-134	4	None	-	-	<LLD	0
	Cs-137	4	None	-	-	<LLD	0
	Ba-La-140	9	None	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-C.3.a

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/L γ EMITTERS AND TRITIUM IN DRINKING WATER

STATION	DATE	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zn-Nb-95	I-131	Cs-134	Cs-137	Ba-La-140
C07	01-07	<126	<93	<6	<5	<13	<7	<13	<11	<7	<7	<6	<10
	04-01	<121	<13	<6	<5	<14	<5	<12	<10	<10	<5	<6	<10
	07-01	<115	<106	<6	<6	<12	<6	<11	<11	<6	<6	<6	<14
	10-13	<119	<37	<3	<3	<7	<3	<6	<5	<4	<4	<3	<6
C10	01-07	<129	<38	<2	<2	<5	<3	<5	<4	<3	<3	<3	<5
	04-01	<121	<96	<5	<5	<12	<6	<12	<10	<11	<7	<5	<10
	07-01	<115	<42	<2	<3	<6	<2	<6	<5	<10	<3	<3	<6
	10-13	<119	<57	<4	<4	<7	<3	<6	<5	<4	<4	<4	<9
C18	01-07	<129	<92	<5	<5	<13	<7	<12	<9	<8	<7	<4	<13
	04-01	<121	<62	<3	<4	<8	<5	<7	<5	<7	<4	<4	<4
	07-01	<115	<90	<5	<4	<11	<4	<10	<8	<5	<5	<5	<12
	10-13	<119	<21	<4	<4	<8	<2	<8	<5	<4	<4	<4	<8

Drinking Water

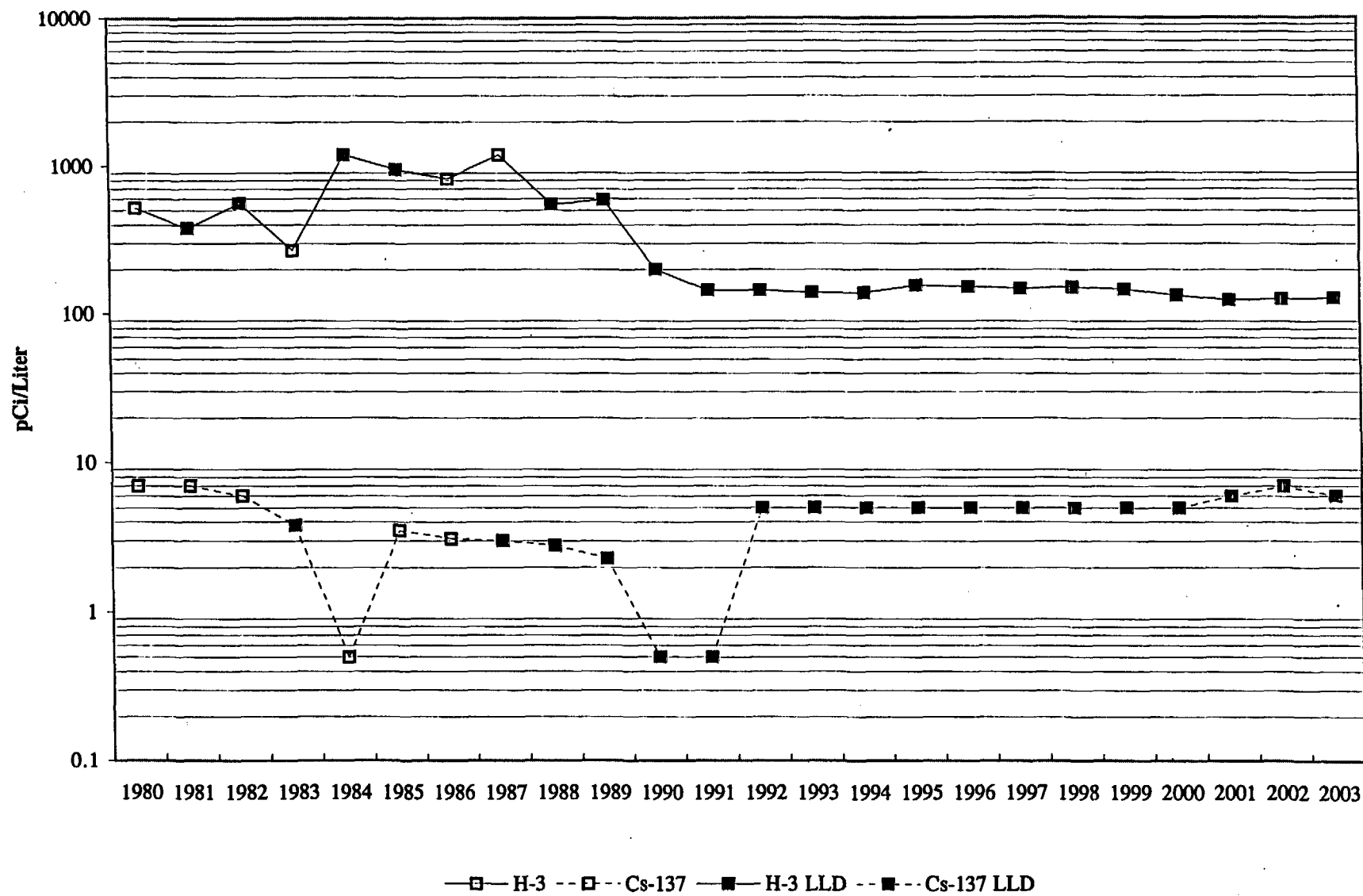


TABLE IV-C.4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	<u>ALL INDICATOR LOCATIONS</u>	<u>LOCATION WITH HIGHEST MEAN</u>		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
SHORELINE SEDIMENT (pCi/kg)	γ Spec 8 Cs-134 Cs-137	7 7	<LLD 37 (3/6) (21 - 59)	— C14M 1.2 @ 276°	— 40 (2/2)	<LLD <LLD	0 0

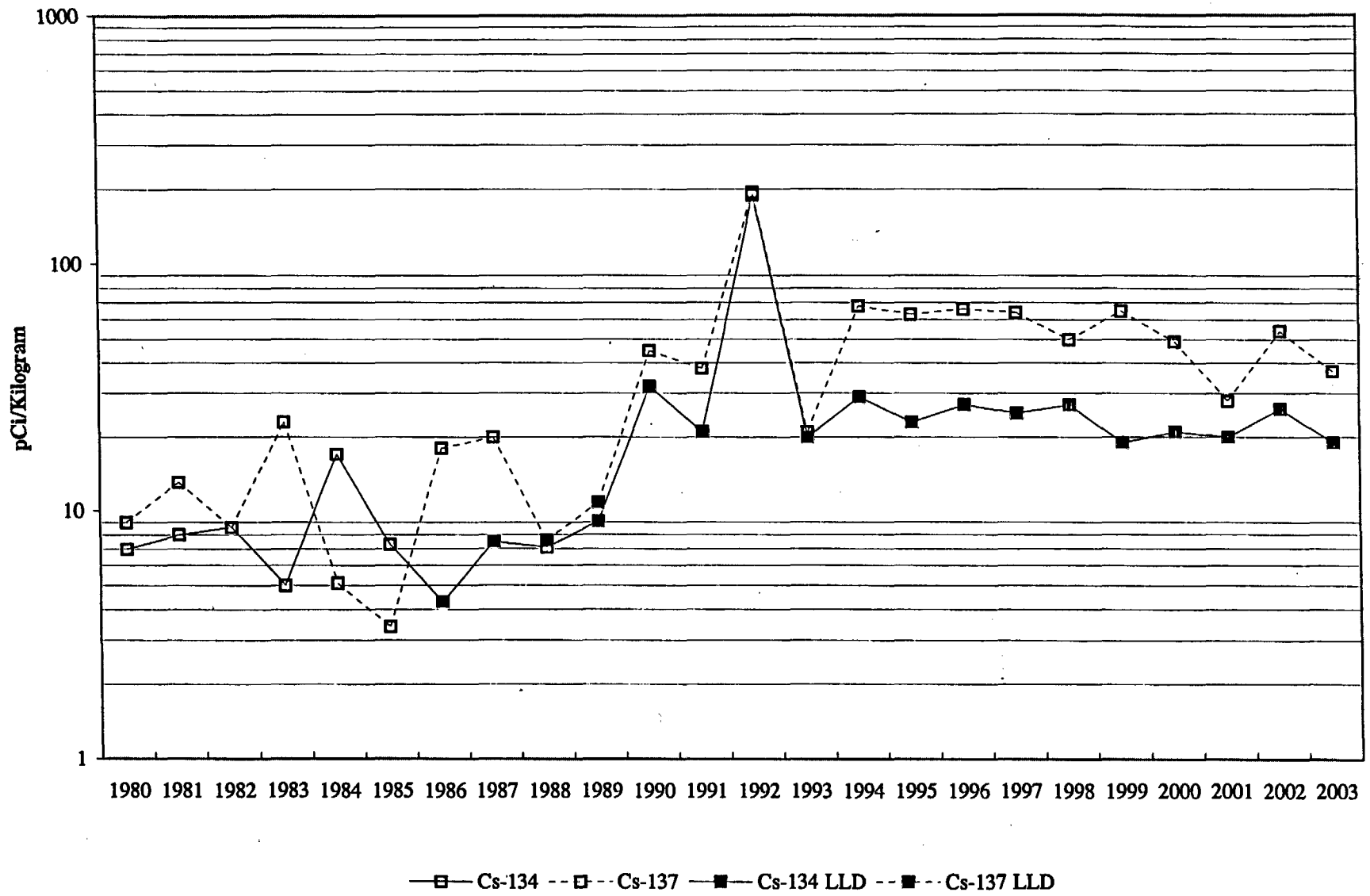
¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-C.4.a
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003
pCi/kg γ EMITTERS IN SHORELINE SEDIMENT

STATION	PERIOD	Co-58	Co-60	Cs-134	Cs-137	K-40	Ra-226
C09	First Half	<9	<9	<12	<10	284 \pm 57	312 \pm 11
	Second Half	<13	<10	<16	<12	415 \pm 74	349 \pm 16
C14H	First Half	<14	105 \pm 3	<15	31 \pm 3	1158 \pm 58	867 \pm 18
	Second Half	<13	<21	<17	<18	1002 \pm 108	1059 \pm 20
C14M	First Half	<18	146 \pm 8	<19	59 \pm 10	1346 \pm 101	1148 \pm 22
	Second Half	<12	<12	<15	21 \pm 8	1042 \pm 91	947 \pm 20
C14G	First Half	<11	<13	<13	<11	159 \pm 60	709 \pm 16
	Second Half	<14	<22	<15	<16	499 \pm 59	1155 \pm 21

C09 is the control station at Ft. Island Beach. C14H, C14M, & C14G are discharge canal stations.

Shoreline Sediment



IV-D. INGESTION PATHWAY

To evaluate the ingestion pathway, samples are taken of fish, oysters, broad leaf vegetation, citrus, and watermelon.

1. Quarterly carnivorous fish samples were taken at two locations: C29 at the end of the discharge canal, and C30, the control location near the mouth of the intake canal. None of the required radionuclides were found in measurable quantities. The highest cesium-137 LLD for station C29 was 31 pCi/kg. Naturally occurring potassium-40 was quantified in all eight samples at concentrations near 3000 pCi/kg.
2. Quarterly oyster samples were taken at the same locations as fish samples, C29 and C30. Of the isotopes required to be evaluated, none indicated measurable amounts of radioactivity. However, silver-110m was quantified in three samples at C29, with concentrations of 545 pCi/kg, 314 pCi/kg, and 37 pCi/kg. This is similar to 2002 and somewhat lower than 2001, during which silver-110m was identified in four samples, with activity ranging from 628 pCi/kg to 3509 pCi/kg. Silver-110m in 2001 was associated with higher than normal releases of silver-110m in liquid effluents in late January. The elevated silver-110m in liquid effluents was in turn due to a release of radioactive material from a plant demineralizer (ref. NCR 46245).
3. Monthly broad leaf vegetation samples were taken at two indicator locations, C48A and C48B, and one control location, C47. Eight of twenty-four indicator samples had measurable amounts of cesium-137 with an average concentration of 31 pCi/kg and a range of 19 to 53 pCi/kg. This is similar to recent years results. Six of twelve control station samples had measurable amounts of cesium-137 with an average of 41 pCi/kg and a range of 6 to 137 pCi/kg.
4. Citrus samples are taken at station C19 and watermelon samples were obtained at station C04. None of the required radionuclides were found in measurable quantities in watermelon, but Cs-137 was quantified at 20 pCi/kg in the citrus sample.

TABLE IV-D.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
CARNIVOROUS	γ Spec 8						
FISH							
(pCi/kg)	Mn-54	16	<LLD	-	-	<LLD	0
	Fe-59	28	<LLD	-	-	<LLD	0
	Co-58	15	<LLD	-	-	<LLD	0
	Co-60	16	<LLD	-	-	<LLD	0
	Zn-65	32	<LLD	-	-	<LLD	0
	Cs-134	16	<LLD	-	-	<LLD	0
	Cs-137	18	<LLD	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-D.1.a

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/kg γ EMITTERS IN CARNIVOROUS FISH

STATION	QUARTER	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	K-40
C29	1	<29	<24	<67	<37	<70	<35	<28	2034 \pm 238
	2	<13	<13	<28	<15	<31	<14	<15	2396 \pm 147
	3	<14	<12	<28	<16	<32	<17	<16	2666 \pm 148
	4	<26	<38	<81	<36	<77	<41	<31	2867 \pm 294
C30	1	<19	<22	<39	<22	<43	<20	<17	2896 \pm 207
	2	<21	<21	<53	<28	<55	<25	<22	3160 \pm 208
	3	<29	<29	<62	<36	<71	<31	<33	2031 \pm 232
	4	<16	<17	<43	<25	<41	<25	<19	2531 \pm 206

Carnivorous Fish

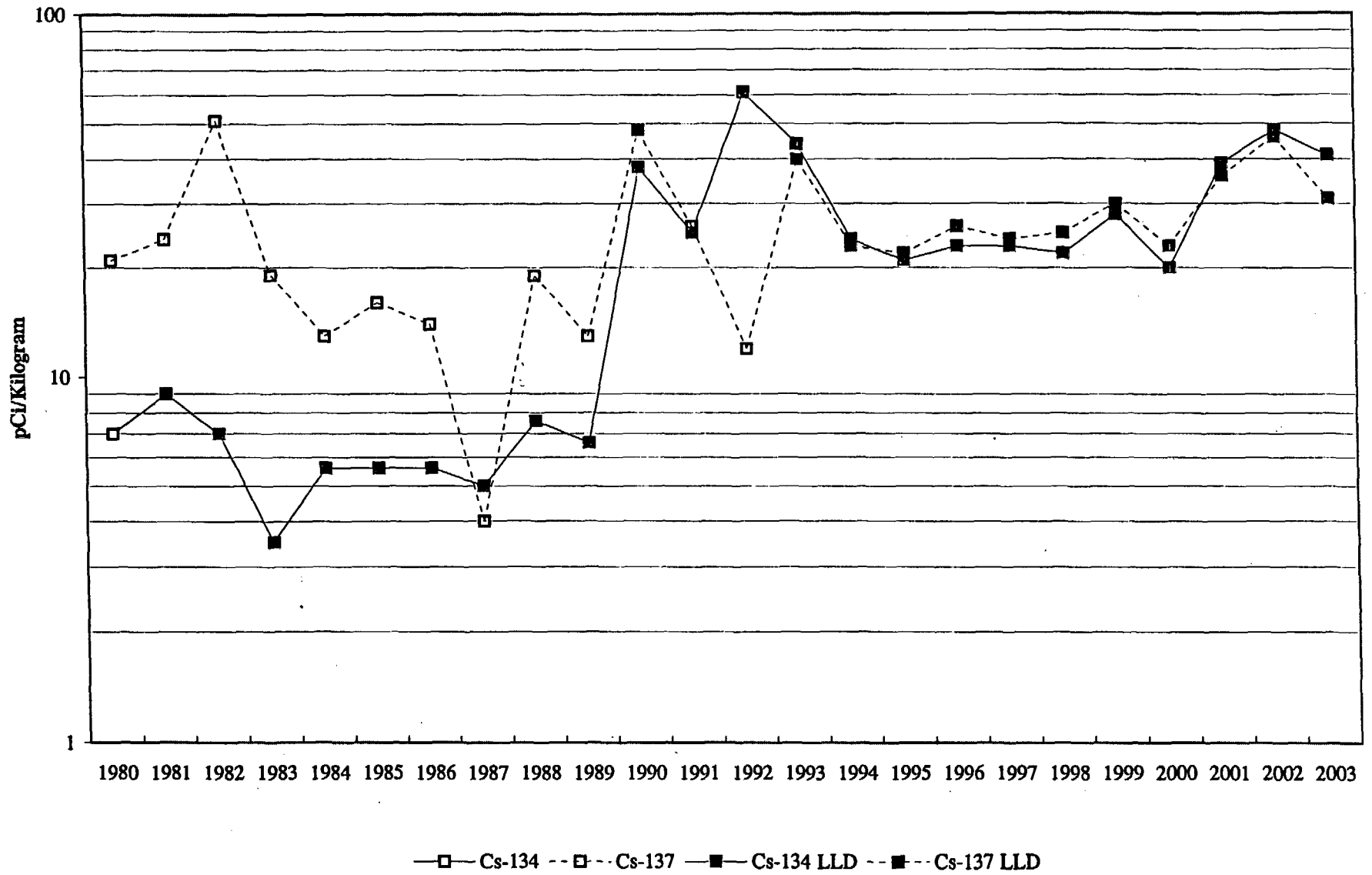


TABLE IV-D.2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
OYSTERS (pCi/kg)	γ Spec 8						
	Mn-54	16	<LLD	-	-	<LLD	0
	Fe-59	28	<LLD	-	-	<LLD	0
	Co-58	15	<LLD	-	-	<LLD	0
	Co-60	16	<LLD	-	-	<LLD	0
	Zn-65	32	<LLD	-	-	<LLD	0
	Cs-134	16	<LLD	-	-	<LLD	0
	Cs-137	18	<LLD	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-D.2.a

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/kg γ EMITTERS IN OYSTERS

STATION	QUARTER	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	K-40
C29	1	<33	<31	<72	<31	<68	<27	<34	1238 \pm 188
	2	<6	<6	<13	<7	<15	<7	<7	507 \pm 57
	3	<12	<16	<35	<16	<32	<15	<17	804 \pm 80
	4	<34	<35	<68	<27	<89	<38	<39	1001 \pm 141
C30	1	<9	<10	<21	<12	<21	<11	<10	1311 \pm 74
	2	<6	<6	<13	<7	<13	<7	<6	960 \pm 60
	3	<19	<20	<52	<22	<37	<21	<19	989 \pm 125
	4	<19	<20	<44	<25	<39	<21	<21	316 \pm 147

Ag-110m was quantified in three samples taken at station C29, near the end of the discharge canal. Concentrations were 37 pCi/kg (May 13), 545 pCi/kg (August 6), and 314 pCi/kg (November 13).

Ag-110m was not quantified in samples taken at control station C30.

Oysters

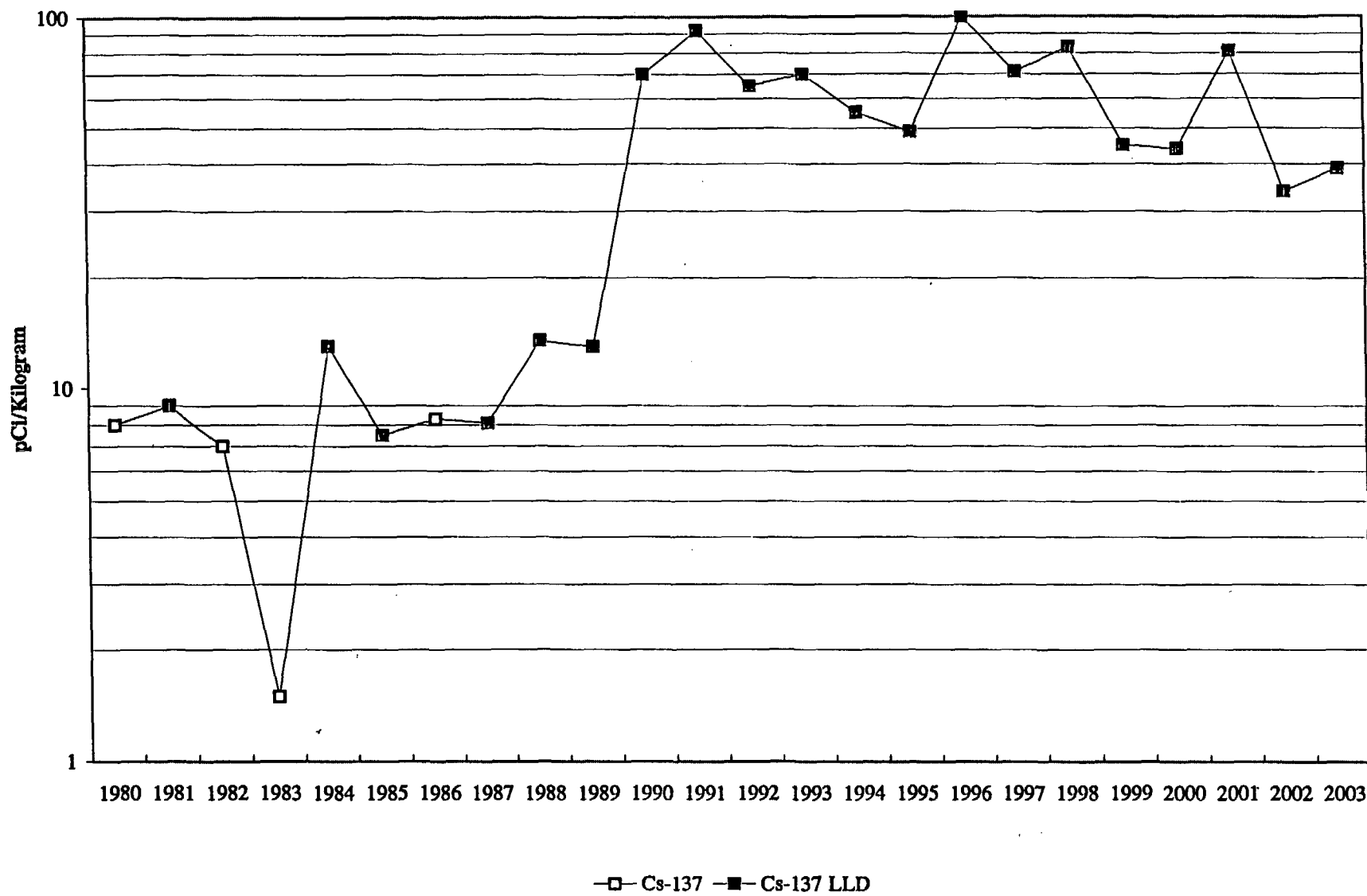


TABLE IV-D.3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	<u>ALL INDICATOR LOCATIONS</u>	<u>LOCATION WITH HIGHEST MEAN</u>		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
BROAD LEAF VEGETATION (pCi/kg)	γ Spec 36						
	I-131	8	<LLD	-	-	<LLD	0
	Cs-134	8	<LLD	-	-	<LLD	0
	Cs-137	8	31 (8/24) (19 - 53)	C48B 0.8 @ 34°	53 (1/12)	41 (6/12) (6 - 137)	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-D.3.a

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/kg OF γ EMITTERS IN BROAD LEAF VEGETATION

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C47	JAN	<17	<14	<13	4781 \pm 183
	FEB	<8	<6	<6	5402 \pm 87
	MAR	<5	<6	6 \pm 2	2550 \pm 59
	APR	<20	<15	<14	2729 \pm 135
	MAY	<13	<13	<19	2751 \pm 137
	JUN	<9	<10	31 \pm 4	2830 \pm 129
	JUL	<11	<15	30 \pm 7	3258 \pm 181
	AUG	<5	<5	9 \pm 2	3060 \pm 64
	SEP	<10	<13	33 \pm 6	2930 \pm 142
	OCT	<17	<17	<16	4200 \pm 208
	NOV	<18	<18	137 \pm 10	2899 \pm 177
	DEC	<18	<22	<18	5907 \pm 258
C48A	JAN	<13	<11	<11	1169 \pm 98
	FEB	<16	<10	25 \pm 6	2921 \pm 141
	MAR	<7	<8	<7	1519 \pm 76
	APR	<27	<13	<16	2279 \pm 165
	MAY	<12	<10	<10	2558 \pm 136
	JUN	<12	<10	19 \pm 7	4276 \pm 156
	JUL	<16	<18	44 \pm 7	3238 \pm 182
	AUG	<7	<8	29 \pm 5	2972 \pm 94
	SEP	<8	<8	22 \pm 4	2702 \pm 91
	OCT	<5	<5	20 \pm 3	3005 \pm 61
	NOV	<15	<19	37 \pm 7	3537 \pm 187
	DEC	<9	<9	<8	5010 \pm 118

TABLE IV-D.3.a (CONT'D)

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/kg OF γ EMITTERS IN BROAD LEAF VEGETATION

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C48B	JAN	<14	<12	<13	2962 \pm 140
	FEB	<17	<10	53 \pm 6	995 \pm 89
	MAR	<17	<15	<19	3136 \pm 176
	APR	<26	<18	<16	3369 \pm 208
	MAY	<13	<18	<17	2266 \pm 174
	JUN	<10	<11	<12	3374 \pm 143
	JUL	<7	<8	<8	3193 \pm 93
	AUG	<16	<16	<17	1922 \pm 158
	SEP	<6	<6	<6	6159 \pm 89
	OCT	<13	<12	<13	3395 \pm 143
	NOV	<8	<8	<8	2985 \pm 92
	DEC	<18	<15	<21	2950 \pm 197

Broad Leaf Vegetation

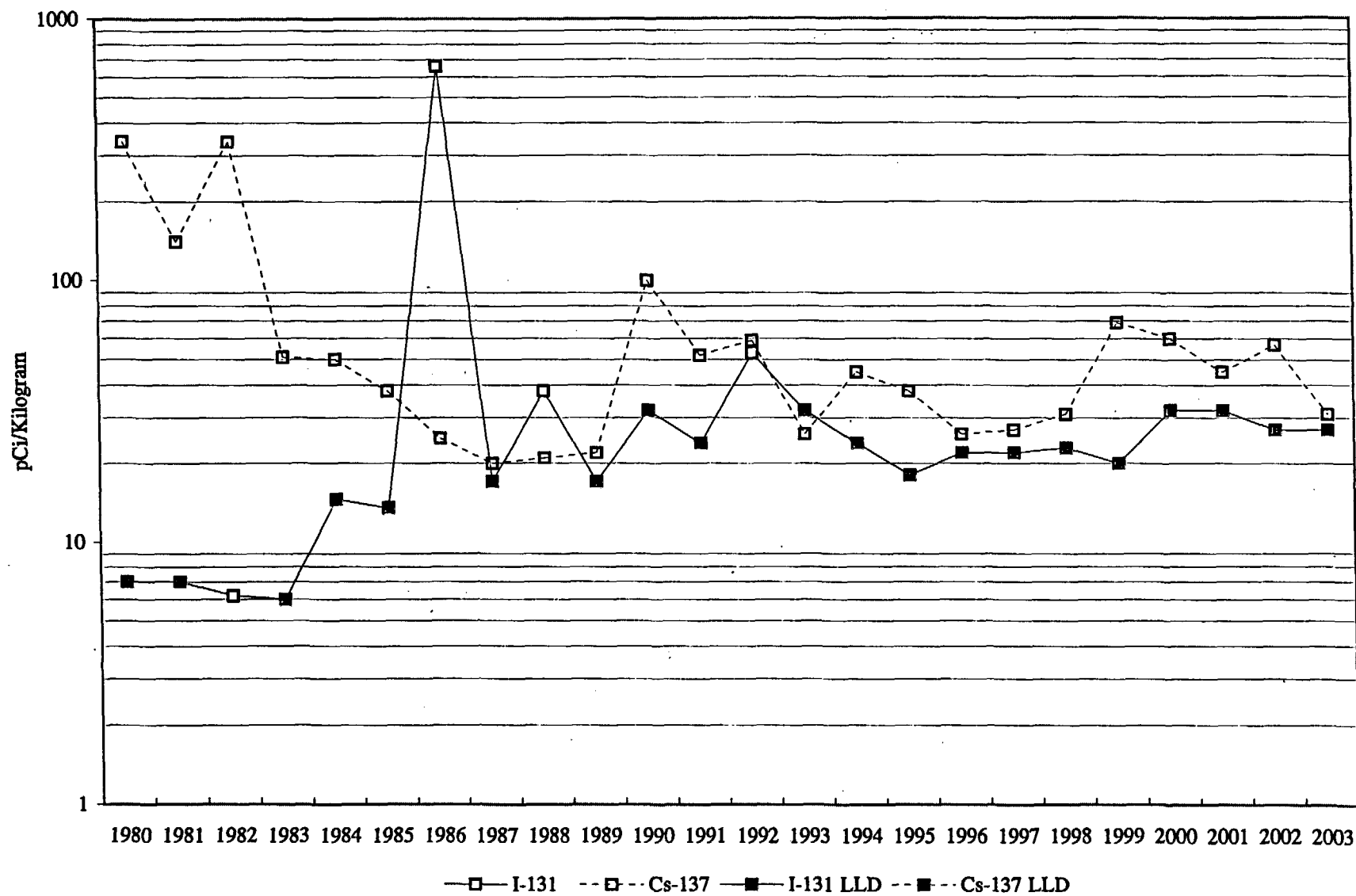


TABLE IV-D.4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2003

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
WATERMELON (pCi/kg)	γ Spec 1						
	I-131	8	<LLD	-	-	None	0
	Cs-134	8	<LLD	-	-	None	0
	Cs-137	8	<LLD	-	-	None	0
CITRUS (pCi/kg)	γ Spec 1						
	I-131	8	<LLD	-	-	None	0
	Cs-134	8	<LLD	-	-	None	0
	Cs-137	8	20 (1/1)	C19 9.6 @ 57°	20 (1/1)	None	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-D.4.a

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2003

pCi/kg OF γ EMITTERS IN WATERMELON AND CITRUS

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C04 - Watermelon	June	<6	<6	<7	1467 \pm 70
C19 - Citrus	January	<10	<7	20 \pm 4	1635 \pm 83