



Progress Energy

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

Ref: ITS 5.7.1.1(b)

May 14, 2003
3F0503-02

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

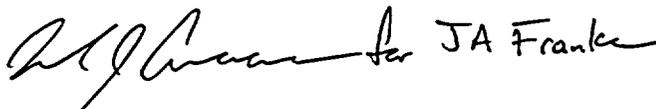
Subject: Crystal River Unit 3 – 2002 Annual Radiological Environmental Operating Report

Dear Sir:

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, 2002 through December 31, 2002.

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

J. A. Franke
Plant General Manager

JAF/ff

Attachment

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

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PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

2002

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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 2002 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 2002 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 - 2002

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 - 2002

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	80
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 - 2002
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	
Drinking Water	3	Quarterly	Tritium	2000 pCi/L	
		Quarterly	γ Spec :	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 - 2002

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

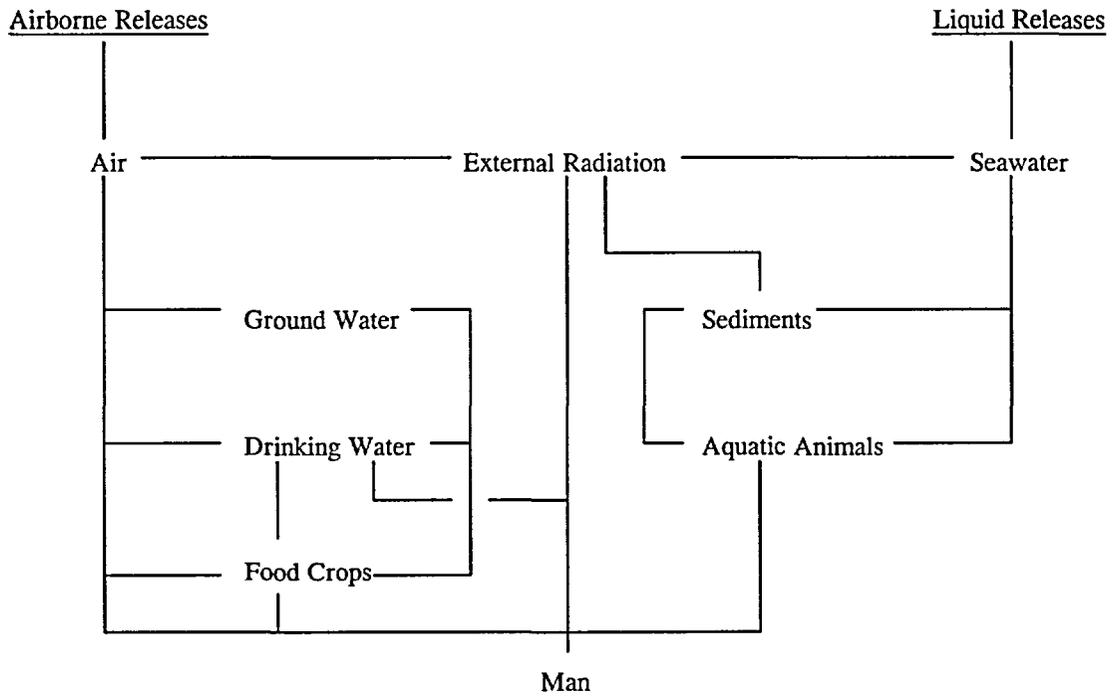


FIGURE I-1: Environmental Media and Exposure Pathways

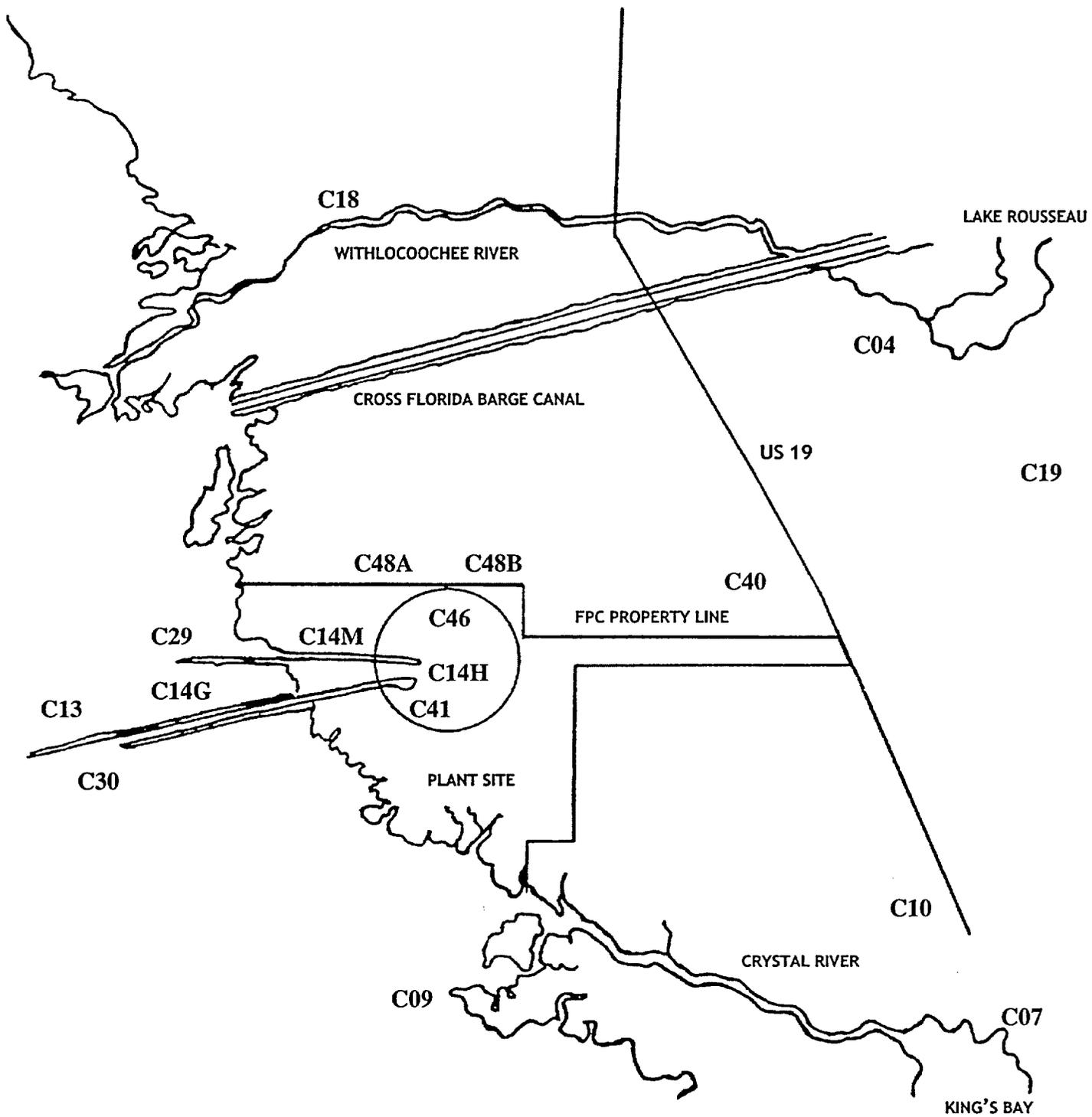
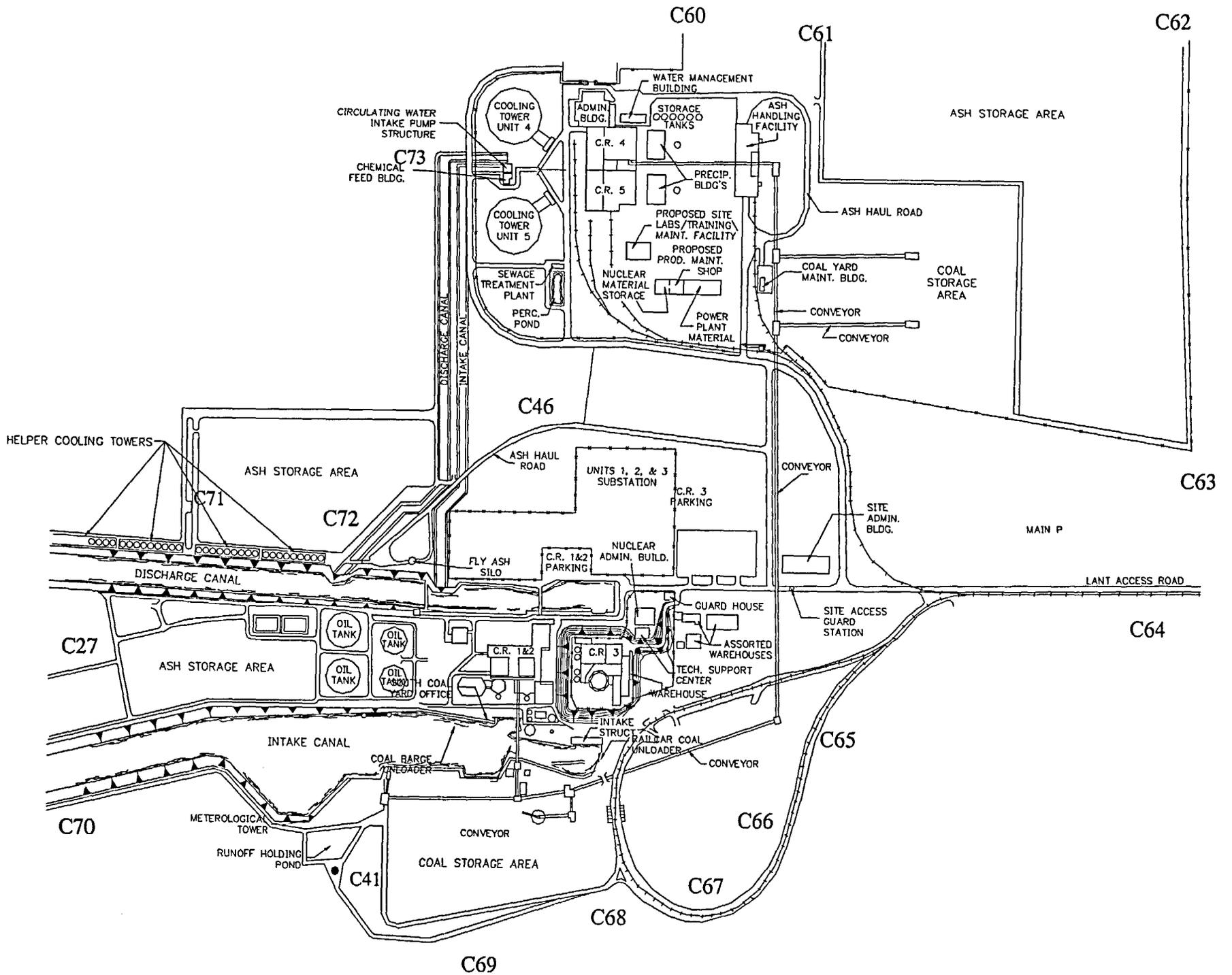


FIGURE I-2: Environmental Monitoring Sample Stations (non-TLDs)

FIGURE I-3: Environmental Monitoring TLD Locations (on site)



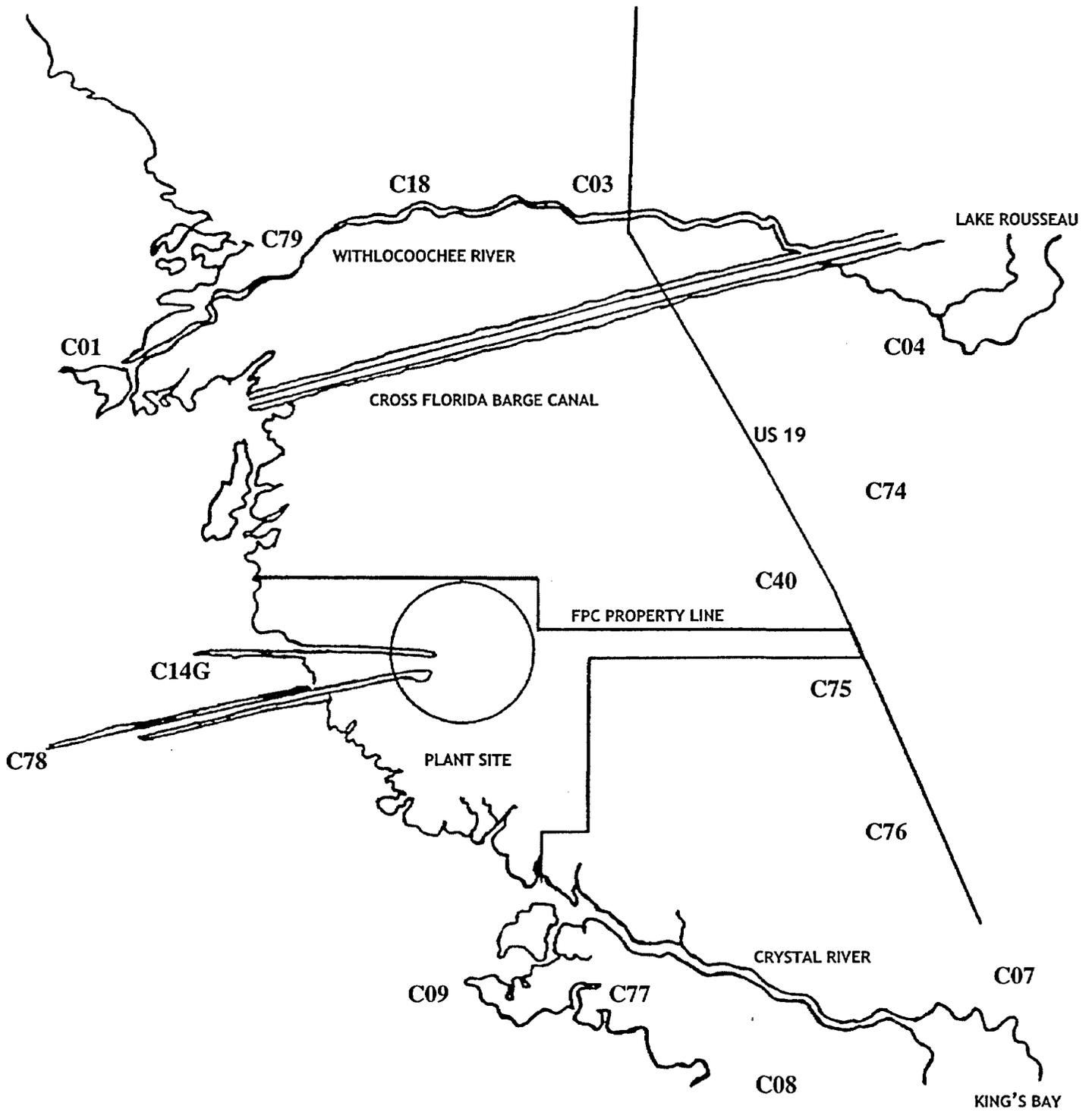


FIGURE I-4: Environmental Monitoring TLD Locations (off site)

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°	*	*
NNE	3.95 @ 15°	4.88 @ 17°	*
NE	3.84 @ 54°	*	*
ENE	3.43 @ 60°		*
E	2.40 @ 92°	*	*
ESE	4.24 @ 102°	4.24 @ 102°	*
SE	4.90 @ 133°	*	*
SSE	3.53 @ 149°	*	*
S	*	*	*
SSW	*	*	*
SW	*	*	*
WSW	*	*	*
W	*	*	*
WNW	*	*	*
NW	4.8 @ 323°	*	*
NNW	4.63 @ 341° 4.65 @ 347°	*	*

* 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.

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 2002:

Media	Nuclide	Reported Value	Reported Error	EML Value	EML Error	Reported/EML	Evaluation
Air	Co-60	34.37	0.180	30.52	0.652	1.126	W
Air	Cs-137	29.21	0.160	28.23	0.701	1.035	A
Air	Gross Beta	1.220	0.030	1.300	0.130	0.938	A
Soil	Cs-137	1327.00	4.00	1326.6	66.51	1.000	A
Soil	K-40	603.5	4.160	621.67	33.86	0.971	A
Vegetation	Co-60	1.092	0.027	11.23	0.677	0.097	N
Vegetation	Cs-137	30.770	0.220	313.667	15.910	0.098	N
Vegetation	K-40	82.940	1.480	864.330	47.220	0.096	N
Water	Co-60	345.10	0.420	347.33	12.40	0.994	A
Water	Cs-137	57.300	0.230	56.067	2.929	1.022	A
Water	H-3	301.560	5.140	283.70	3.380	1.063	A

Upon receipt of these results the HRS lab investigated the results that were not acceptable (evaluation code "N"). It was determined that an error was made in the calculation of the mass of the vegetation samples. With the corrected mass the reported values changed to 10.91 for Co-60, 306.3 for Cs-137, and 839.5 for K-40, all of which are well within the acceptable range of error.

Results for December 2002:

Media	Nuclide	Reported Value	Reported Error	EML Value	EML Error	Reported/ EML	Evaluation
Air	Co-60	24.650	3.100	23.00	0.059	1.072	A
Air	Cs-137	36.310	0.740	32.50	0.777	1.117	A
Soil	Cs-137	884.300	19.38	829.330	41.580	1.066	A
Soil	K-40	686.860	18.55	637.670	34.260	1.077	A
Vegetation	Co-60	9.200	0.300	9.660	0.630	0.952	A
Vegetation	Cs-137	294.00	6.000	300.670	15.25	0.978	A
Vegetation	K-40	1463.0	40.00	1480.00	77.800	0.989	A
Water	Co-60	276.300	0.590	268.67	9.710	1.028	A
Water	Cs-137	86.050	0.500	81.430	4.280	1.057	A
Water	H-3	255.080	4.760	227.30	5.615	1.122	A

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, all had measurable activity. The average indicator concentration was 17 pCi/1000 m³ with a range of 4 to 34 pCi/1000 m³. The average indicator concentration for 1996 through 2001 was 15 pCi/1000 m³. The control location concentration for 2002 averaged 18 pCi/1000 m³, with a range of 6 to 34 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 2.0 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 as complete samples were missed during two sample periods, beginning 9/3/02 and ending 9/18/02. The sample pump did not run for approximately 268 hours during this two week period due to a transformer failure on a nearby power pole.

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, 2002

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	6.4	17 (260/260) (4 - 34)	C46 0.37 @ 357°	18 (52/52) (5 - 31)	18 (52/52) (6 - 34)	0
	Cs-134	0.8	<LLD	-	-	<LLD	0
	Cs-137	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 - 2002

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
01-07	<.03	<.03	<.03	<.03	<.03	<.03
01-15	<.03	<.03	<.03	<.03	<.03	<.03
01-21	<.03	<.03	<.03	<.03	<.03	<.03
01-28	<.02	<.02	<.02	<.02	<.02	<.02
02-05	<.02	<.02	<.02	<.02	<.02	<.02
02-12	<.02	<.02	<.02	<.02	<.02	<.02
02-18	<.03	<.03	<.03	<.03	<.03	<.03
02-26	<.01	<.01	<.01	<.01	<.01	<.01
03-05	<.03	<.03	<.03	<.03	<.03	<.04
03-11	<.04	<.04	<.04	<.04	<.04	<.04
03-19	<.02	<.02	<.02	<.02	<.02	<.02
03-26	<.03	<.03	<.03	<.03	<.03	<.03
04-01	<.03	<.03	<.03	<.03	<.03	<.03
04-09	<.01	<.01	<.01	<.01	<.01	<.01
04-16	<.03	<.03	<.03	<.03	<.03	<.03
04-23	<.03	<.03	<.03	<.03	<.03	<.03
04-30	<.01	<.01	<.01	<.01	<.01	<.01

TABLE IV-A.2 (Cont'd)
 PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
05-07	<.02	<.02	<.02	<.02	<.02	<.02
05-14	<.02	<.02	<.02	<.02	<.02	<.02
05-21	<.02	<.02	<.02	<.02	<.02	<.02
05-28	<.01	<.01	<.01	<.01	<.01	<.01
06-04	<.02	<.01	<.01	<.01	<.01	<.01
06-11	<.01	<.01	<.01	<.01	<.01	<.01
06-17	<.02	<.02	<.02	<.02	<.02	<.02
06-25	<.01	<.01	<.01	<.01	<.01	<.01
07-02	<.02	<.02	<.02	<.02	<.02	<.02
07-09	<.03	<.03	<.03	<.03	<.03	<.02
07-16	<.03	<.03	<.03	<.03	<.03	<.03
07-23	<.03	<.03	<.03	<.03	<.03	<.03
07-30	<.02	<.02	<.02	<.02	<.02	<.02
08-06	<.02	<.02	<.02	<.02	<.02	<.02
08-13	<.01	<.01	<.01	<.01	<.01	<.01
08-20	<.01	<.01	<.01	<.01	<.01	<.01
08-28	<.02	<.02	<.01	<.01	<.02	<.01

TABLE IV-A.2 (Cont'd)
 PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
09-03	<.03	<.03	<.03	<.03	<.03	<.03
09-11	<.02	<.02	<.01	<.02	<.02	<.02
09-18	<.02	<.02	<.02	<.02	<.02	<.02
09-25	<.02	<.02	<.02	<.02	<.02	<.02
10-01	<.03	<.03	<.03	<.03	<.03	<.03
10-08	<.03	<.03	<.03	<.03	<.03	<.03
10-15	<.02	<.02	<.02	<.02	<.02	<.02
10-22	<.02	<.02	<.02	<.02	<.02	<.02
10-30	<.02	<.02	<.02	<.02	<.02	<.02
11-05	<.02	<.02	<.02	<.02	<.02	<.02
11-12	<.02	<.02	<.02	<.02	<.02	<.02
11-18	<.02	<.02	<.02	<.02	<.02	<.02
11-26	<.03	<.03	<.03	<.03	<.03	<.03
12-02	<.02	<.02	<.02	<.02	<.02	<.02
12-09	<.04	<.04	<.04	<.04	<.04	<.04
12-16	<.02	<.02	<.02	<.02	<.02	<.02
12-23	<.03	<.03	<.03	<.03	<.03	<.03
12-31	<.01	<.01	<.01	<.01	<.01	<.01

TABLE IV-A.3
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002

pCi/1000m³ GROSS β IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
01-07	24	24	27	25	25	26
01-15	24	34	29	18	26	27
01-21	23	22	29	24	29	21
01-28	8	14	16	9	9	10
02-05	14	13	17	15	11	13
02-12	17	22	23	19	31	17
02-18	30	26	28	23	30	28
02-26	22	25	28	24	20	23
03-05	24	25	20	22	27	27
03-11	17	20	19	18	19	17
03-19	19	22	24	15	25	23
03-26	21	21	18	19	23	23
04-01	23	22	21	14	19	15
04-09	19	21	20	17	18	20
04-16	15	15	22	18	17	19
04-23	11	10	10	11	9	12
04-30	18	21	22	20	23	22

TABLE IV-A.3 (Cont'd)

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002

pCi/1000m³ GROSS β IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
05-07	15	15	12	15	16	14
05-14	18	15	20	15	19	17
05-21	14	17	13	14	18	17
05-28	11	10	11	12	13	15
06-04	11	14	10	11	14	13
06-11	12	17	14	17	17	19
06-17	10	13	10	11	9	9
06-25	7	10	9	11	10	8
07-02	4	11	6	11	9	7
07-09	12	12	11	12	13	9
07-16	10	10	8	14	12	14
07-23	16	14	16	13	14	20
07-30	10	10	12	13	12	15
08-06	9	12	9	12	12	14
08-13	15	14	16	13	12	13
08-20	9	5	6	5	8	11
08-28	6	11	10	11	14	17

TABLE IV-A.3 (Cont'd)

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002

pCi/1000m³ GROSS β IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
09-03	6	7	5	6	5	6
09-11	8	10	11	10	11	9
09-18	11	14	24	13	11	8
09-25	11	12	12	12	15	12
10-01	14	12	13	15	11	11
10-08	22	25	27	22	22	27
10-15	18	11	17	16	12	15
10-22	22	19	22	28	30	29
10-30	12	11	13	15	12	6
11-05	28	29	20	21	27	26
11-12	17	24	20	19	21	20
11-18	17	20	12	21	20	18
11-26	17	24	19	15	19	26
12-02	21	26	23	24	26	34
12-09	9	16	12	14	20	17
12-16	13	17	11	9	18	17
12-23	29	25	21	24	27	34
12-31	16	19	20	19	24	24

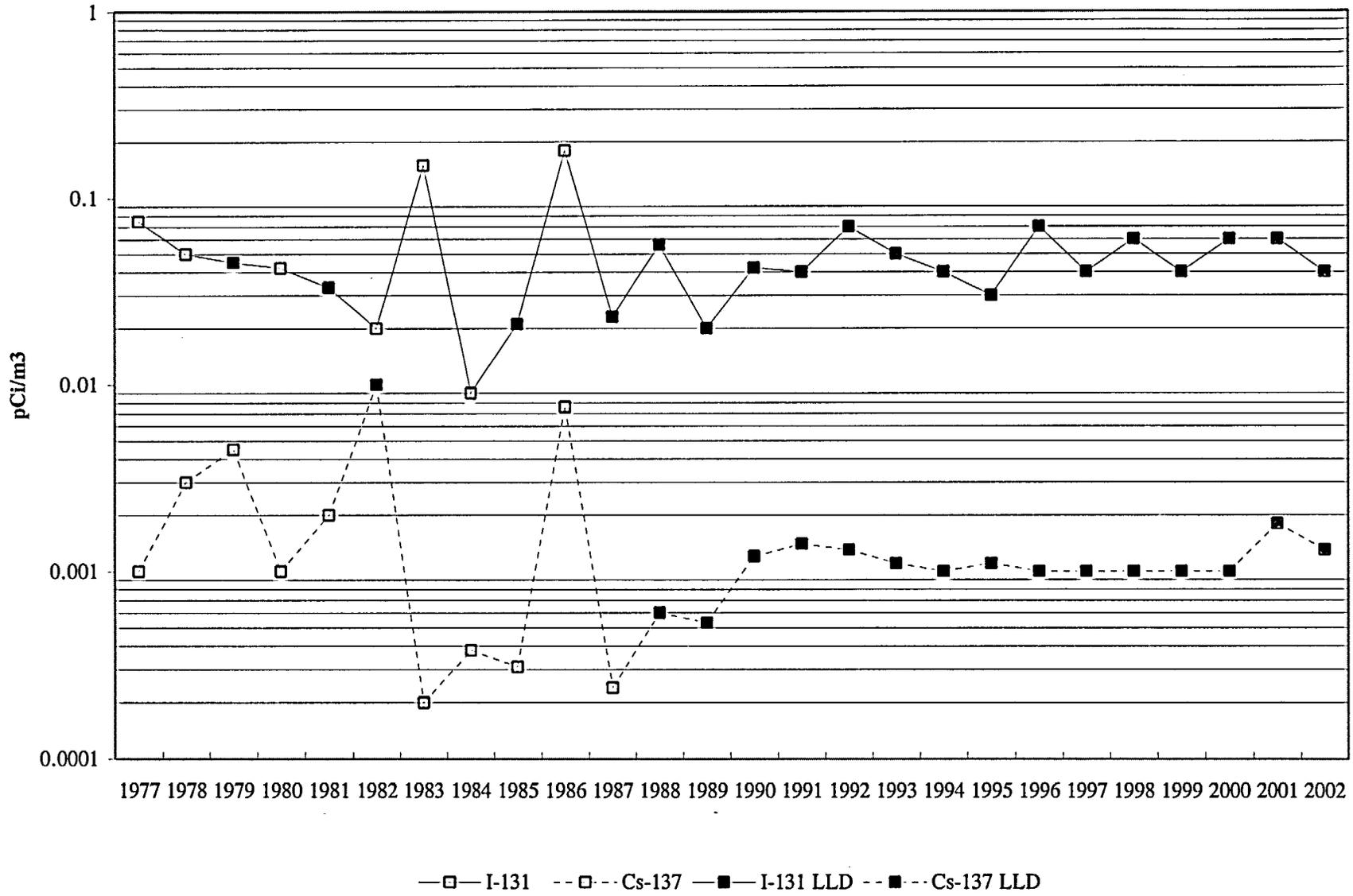
TABLE IV-A.4

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002

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

STATION	NUCLIDE	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
C07	Be-7	179	98	88	116
	K-40	<21	<16	<32	<16
	Cs-134	<1.3	<0.9	<2.0	<0.9
	Cs-137	<0.8	<0.8	<1.3	<0.9
C18	Be-7	191	110	89	120
	K-40	<19	<16	<34	<22
	Cs-134	<1.2	<0.9	<1.4	<1.8
	Cs-137	<1.0	<0.7	<1.1	<1.0
C40	Be-7	191	122	77	119
	K-40	<11	<14	<28	<12
	Cs-134	<1.1	<0.7	<1.5	<0.9
	Cs-137	<1.2	<0.9	<1.3	<1.0
C41	Be-7	166	122	96	123
	K-40	<18	<12	<32	<25
	Cs-134	<1.0	<0.5	<1.9	<1.6
	CS-137	<1.2	<0.6	<0.7	<1.3
C46	Be-7	200	142	106	124
	K-40	<16	<15	<31	<15
	Cs-134	<1.2	<1.0	<1.4	<1.0
	Cs-137	<1.2	<0.9	<1.0	<0.8
C47	Be-7	187	128	110	134
	K-40	<16	<17	<31	<16
	Cs-134	<1.3	<0.8	<1.9	<1.0
	Cs-137	<1.0	<0.6	<1.2	<1.1

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 2002; the third quarter TLD from station C78 was wet at the time of collection, invalidating its results.

The highest on-site dose was 124 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 80 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 50 mrem/yr. The average for all stations was 59 mrem/yr for 2002 and 57 mrem/yr for 2001. 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, 2002

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)	ALL INDICATOR LOCATIONS MEAN RANGE	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
				NAME DISTANCE & BEARING	MEAN RANGE		
DIRECT RADIATION (mrem/yr)	γ DOSE 132	15	59 (128/128) (37 - 132)	C71 0.6 @ 296°	124 (4/4) (110 - 132)	50 (4/4) (48 - 52)	0

TABLE IV-B.1

PROGRESS ENERGY FLORIDA, INC. - CR-3 - 2002

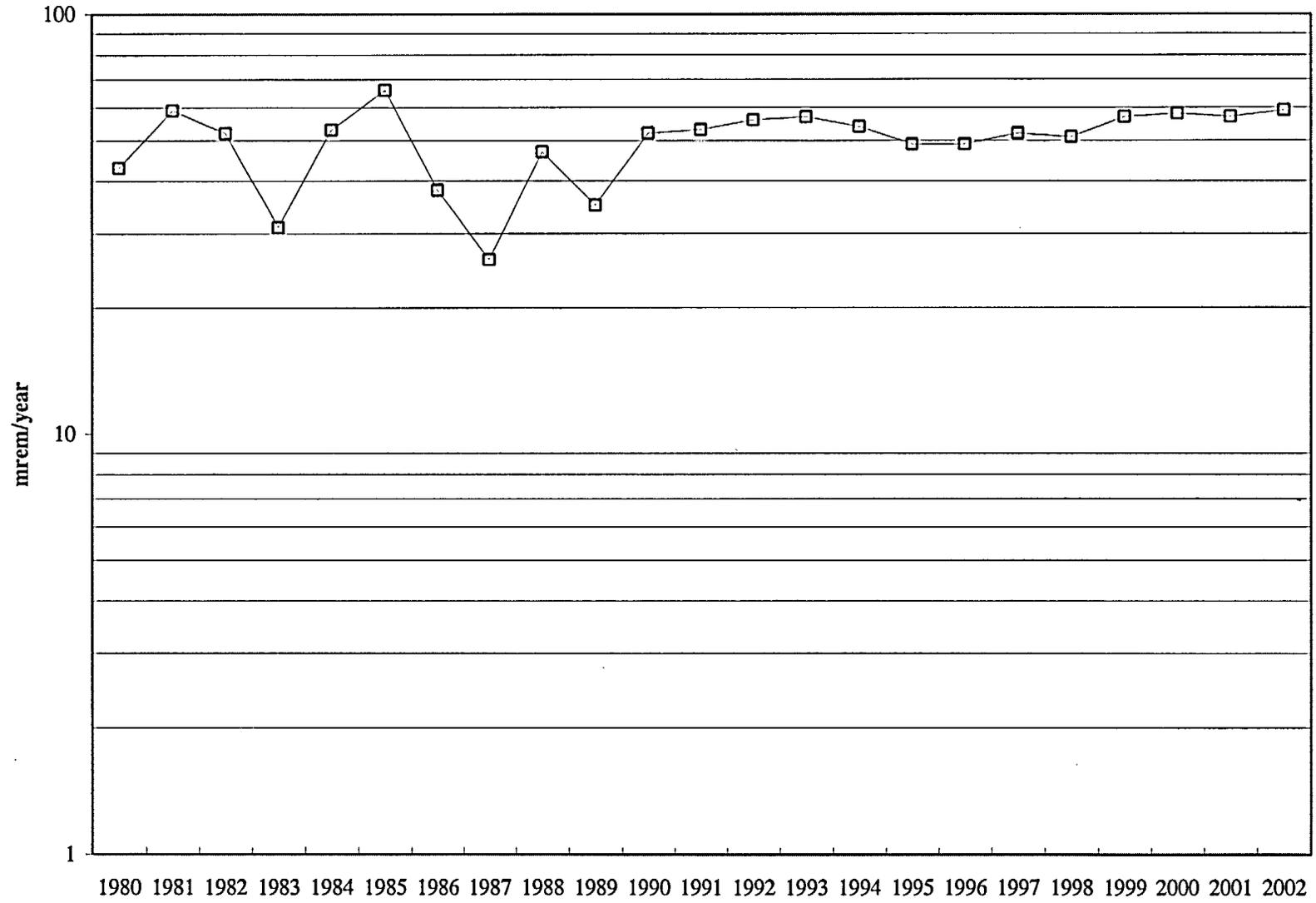
mrem/yr γ Dose

TLD STATION	Quarter	1	2	3	4
CO1		46	46	49	48
CO3		46	48	50	46
CO4		45	46	53	50
CO7*		45	46	46	44
CO8		41	42	41	45
C09		43	44	39	46
C14G		53	54	49	55
C18		47	51	47	55
C27		69	74	67	74
C40*		55	66	58	64
C41		58	61	54	61
C46*		57	60	56	58
C47 (CONTROL)		49	52	48	52
C60		55	60	51	60
C61		59	64	56	61
C62		65	69	63	70
C63		61	65	54	64
C64		56	65	56	63
C65		73	86	75	87
C66		63	68	59	67
C67		59	63	56	63
C68		59	60	58	62
C69		62	63	56	64
C70		64	70	61	69
C71		128	132	110	127
C72		61	65	59	71
C73		56	60	51	58
C74		44	46	39	46
C75		56	57	52	58
C76		50	53	51	53
C77		39	40	37	39
C78		45	49	43	49
C79		46	52	45	50

*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, four had measurable tritium at an average concentration of 202 pCi/L. The sample with the highest concentration of tritium, 253 pCi/L, was obtained in January 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. One control station sample contained tritium at a concentration of 257 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, four had measurable amounts of cobalt-60 and cesium-137. The average cobalt-60 concentration at the indicator locations was 54 pCi/L for 2002, as compared to 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 53 pCi/L for 2002, as compared to 28 pCi/L for 2001, 49 pCi/L for 2000, 65 pCi/L for 1999 and 50 pCi/L for 1998. 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, although the amount of cobalt-60 is somewhat less, and is likely due to improved liquid radwaste processing methods which were implemented in September 1999, prior to refueling outage 11.

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, 2002

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	NUMBER OF NONROUTINE REPORTED MEASUREMENTS	
			MEAN RANGE	NAME DISTANCE & BEARING			MEAN RANGE
SEAWATER (pCi/L)	Tritium 36	131	202 (4/24) (151-253)	C14H 0.12 @ 325°	213 (2/12) (172-253)	257 (1/12)	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 - 2002

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	<120	258 \pm 25	<2	<3	<6	<3	<5	<5	<4	<3	<3	<4
	FEB	<120	351 \pm 49	<7	<6	<10	<6	<14	<10	<6	<7	<5	<13
	MAR	<121	261 \pm 39	<5	<6	<12	<7	<10	<9	<9	<6	<5	<8
	APR	<118	256 \pm 40	<6	<6	<11	<7	<14	<10	<6	<6	<6	<9
	MAY	<123	313 \pm 48	<5	<6	<10	<5	<10	<9	<6	<5	<5	<12
	JUN	<123	323 \pm 22	<3	<2	<5	<3	<5	<5	<3	<3	<3	<5
	JUL	<123	293 \pm 46	<5	<6	<12	<6	<13	<10	<6	<7	<5	<11
	AUG	<117	358 \pm 42	<5	<6	<12	<5	<13	<9	<8	<6	<6	<9
	SEP	<122	316 \pm 52	<6	<6	<11	<6	<10	<9	<7	<6	<7	<11
	OCT	<127	251 \pm 24	<3	<3	<6	<3	<4	<6	<3	<4	<3	<6
	NOV	<125	279 \pm 46	<5	<5	<12	<7	<12	<8	<6	<3	<6	<12
	DEC	257 \pm 25	263 \pm 41	<6	<5	<14	<7	<12	<11	<6	<8	<6	<10
C14G	JAN	<120	296 \pm 39	<6	<5	<10	<6	<9	<10	<9	<5	<6	<10
	FEB	151 \pm 40	282 \pm 35	<3	<4	<9	<5	<8	<7	<4	<4	<5	<8
	MAR	<121	249 \pm 44	<5	<5	<11	<8	<10	<10	<8	<7	<6	<5
	APR	<118	301 \pm 29	<3	<3	<6	<4	<7	<6	<5	<4	<4	<5
	MAY	<123	221 \pm 35	<4	<5	<9	<5	<11	<9	<6	<7	<5	<11
	JUN	<123	270 \pm 42	<5	<6	<12	<6	<10	<10	<7	<5	<6	<6
	JUL	<123	306 \pm 41	<6	<5	<12	<8	<9	<10	<7	<7	<4	<11
	AUG	<117	248 \pm 56	<5	<5	<11	<6	<10	<11	<7	<6	<6	<9
	SEP	<122	322 \pm 44	<6	<6	<13	<7	<13	<10	<8	<6	<6	<8
	OCT	<127	339 \pm 47	<5	<6	<12	<6	<13	<8	<7	<6	<6	<14
	NOV	<125	341 \pm 44	<6	<3	<14	<6	<14	<11	<7	<6	<7	<9
	DEC	230 \pm 24	265 \pm 34	<3	<4	<6	<4	<8	<7	<5	<4	<4	<6

TABLE IV-C.1a (CONT'D)

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002

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	<120	278 \pm 46	<7	<5	<10	<6	<12	<13	<11	<5	<8	<5	
	FEB	172 \pm 41	293 \pm 51	<5	<5	<14	<5	<10	<9	<5	<7	<5	<11	
	MAR	<121	318 \pm 47	<6	<6	<10	<6	<13	<10	<9	<6	<6	<7	
	APR	<118	265 \pm 38	<6	<4	<13	<7	<11	<10	<7	<6	<6	<6	
	MAY	<123	268 \pm 46	<5	<5	<12	<6	<10	<10	<6	<6	<6	<12	
	JUN	<123	307 \pm 18	<1	<2	<3	<2	<4	<3	<2	<2	<2	<2	<3
	JUL	<123	257 \pm 33	<4	<4	<7	<4	<8	<6	<5	<4	<4	<4	<6
	AUG	<117	264 \pm 46	<6	<6	<11	<6	<15	<9	<8	<7	<6	<6	<6
	SEP	<122	231 \pm 38	<5	<6	<11	<6	<13	<11	<9	<6	<6	<6	<7
	OCT	<127	317 \pm 44	<5	<5	<12	<7	<11	<8	<7	<7	<6	<6	<13
	NOV	<125	262 \pm 32	<3	<3	<7	<5	<8	<6	<6	<5	<4	<4	<7
	DEC	253 \pm 25	276 \pm 44	<6	<4	<12	<6	<6	<15	<11	<7	<6	<6	<9

Seawater

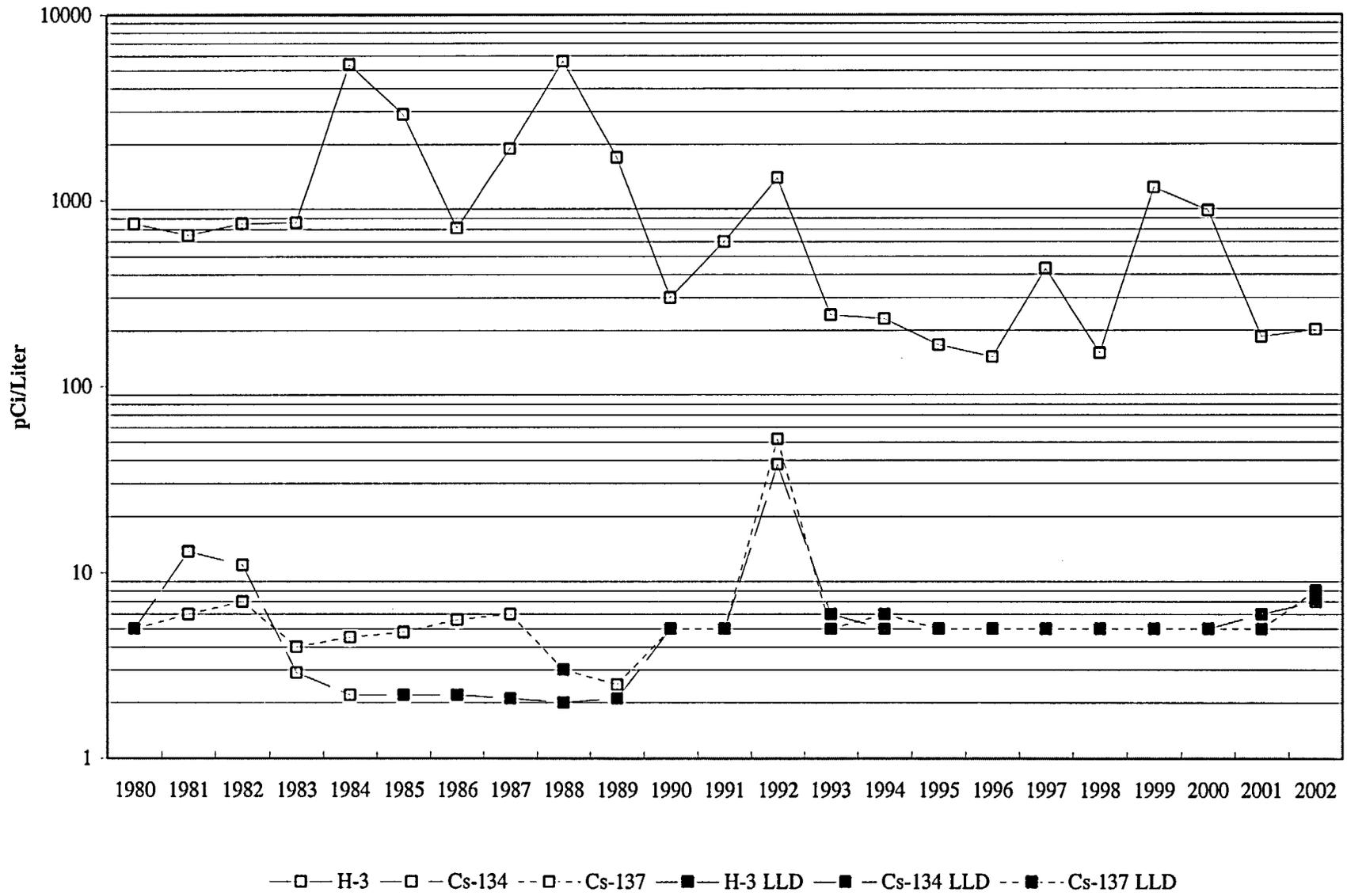


TABLE IV-C.2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2002

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	Tritium 2	131	None	-	-	<LLD	0
WATER (pCi/L)	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 - 2002

pCi/L γ EMITTERS AND TRITIUM IN GROUND WATER

STATION	NUCLIDE	FIRST HALF	SECOND HALF
C40	H-3	<120	<117
	Mn-54	<6	<5
	Fe-59	<12	<11
	Co-58	<6	<5
	Co-60	<6	<5
	Zn-65	<13	<10
	Zr-Nb-95	<10	<11
	I-131	<7	<7
	Cs-134	<6	<6
	Cs-137	<6	<6
	Ba-La-140	<13	<9
	K-40	<90	<91,

Ground Water

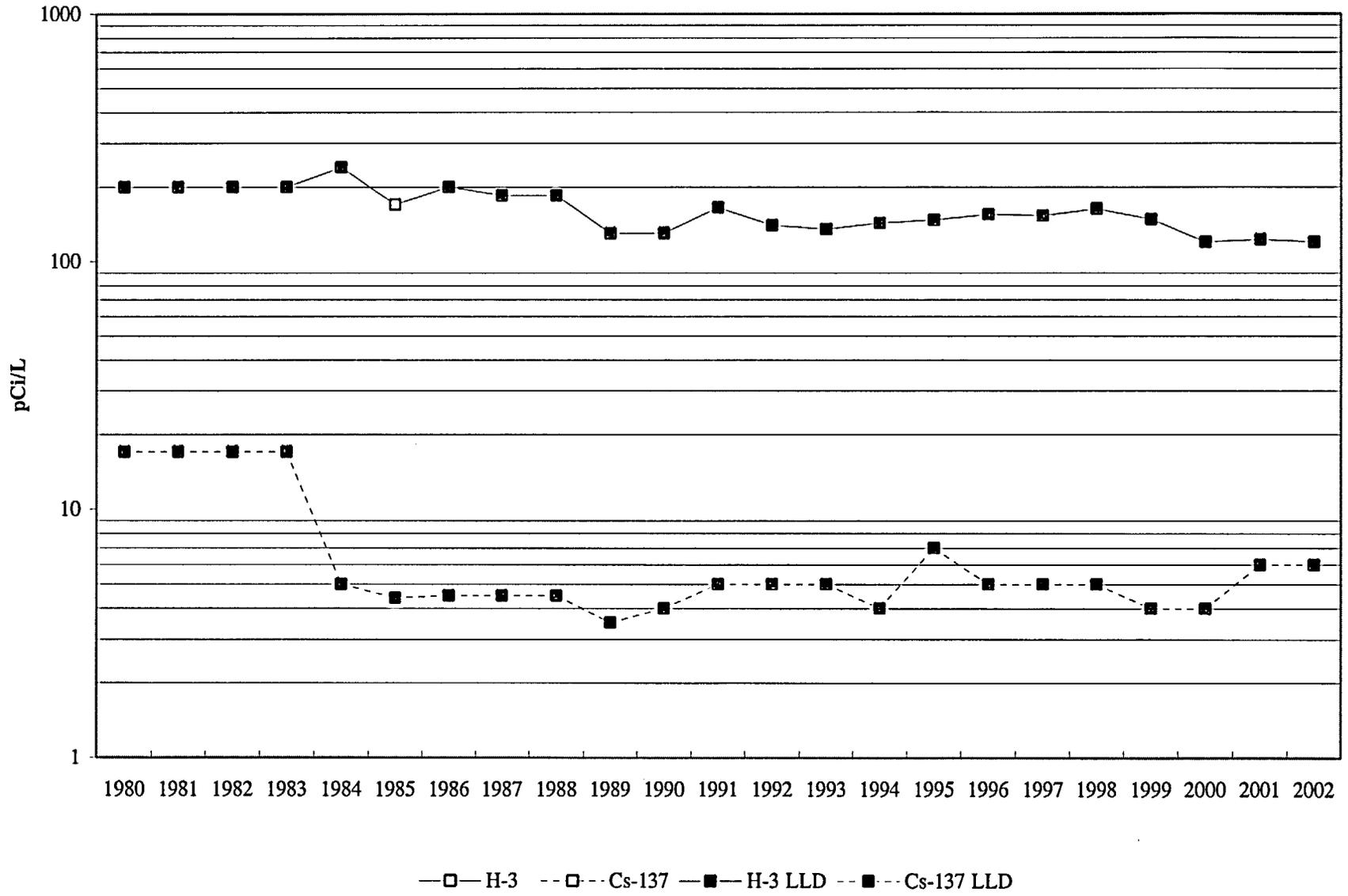


TABLE IV-C.3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2002

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 - 2002

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	01-08	<120	<94	<4	<6	<10	<6	<12	<9	<9	<6	<7	<9
	04-02	<118	33±9	<2	<2	<3	<2	<3	<3	<2	<2	<2	<3
	07-09	<123	<71	<5	<4	<8	<6	<8	<9	<6	<6	<5	<13
	10-01	<127	<86	<5	<4	<10	<5	<8	<10	<6	<4	<7	<14
C10	01-08	<120	<87	<5	<5	<10	<5	<12	<10	<8	<6	<6	<8
	04-02	<118	<82	<6	<6	<12	<5	<12	<9	<6	<6	<5	<8
	07-09	<123	<89	<5	<5	<11	<5	<12	<10	<6	<7	<5	<14
	10-01	<127	<37	<2	<3	<4	<2	<6	<5	<4	<4	<3	<5
C18	01-07	<120	<84	<6	<5	<11	<5	<12	<10	<10	<6	<6	<11
	04-01	<118	<104	<5	<6	<11	<6	<8	<8	<8	<7	<7	<10
	07-09	<123	<38	<2	<2	<5	<3	<5	<4	<3	<3	<3	<6
	10-01	<127	<42	<4	<3	<7	<3	<5	<6	<3	<4	<3	<6

Drinking Water

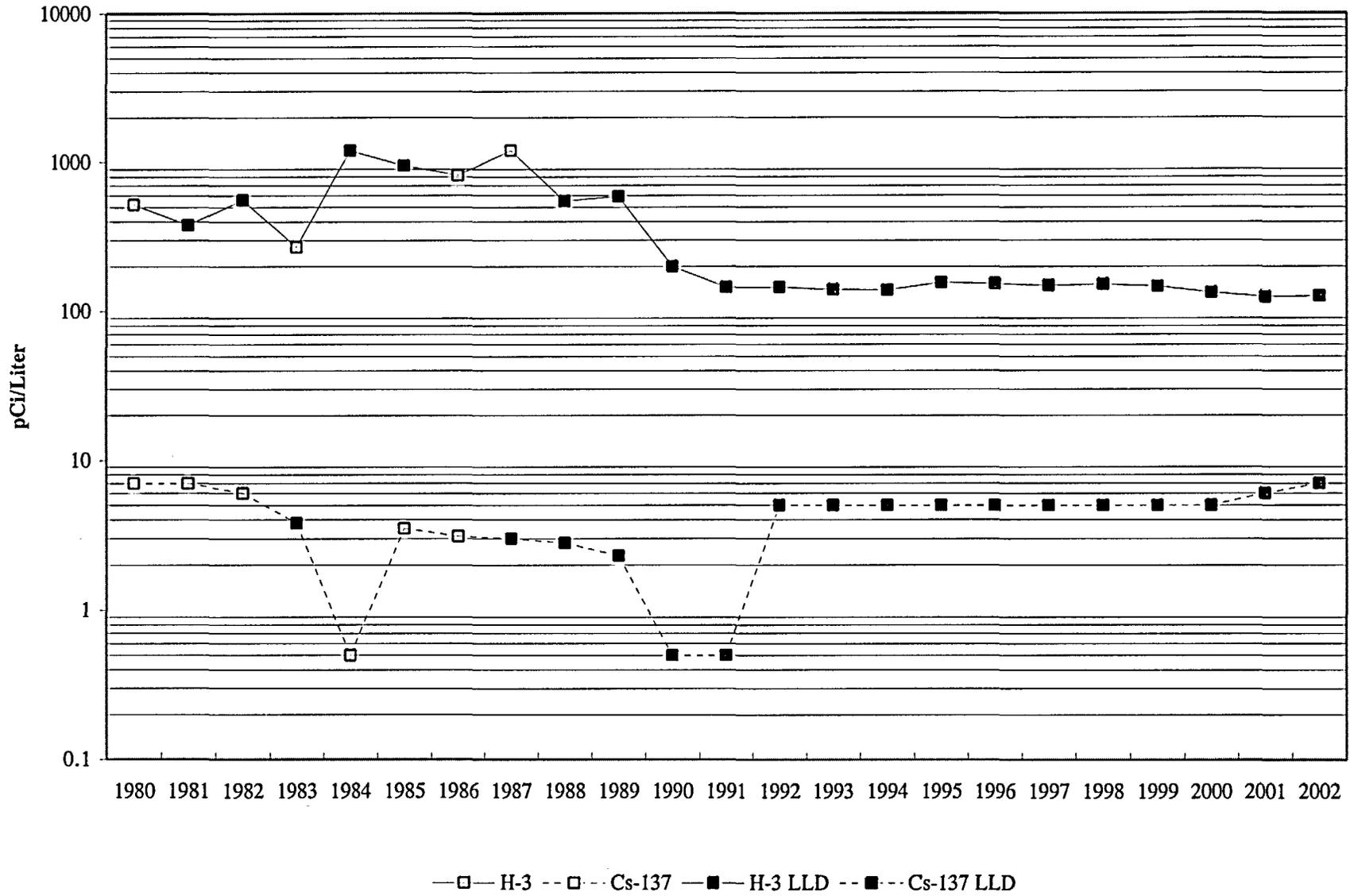


TABLE IV-C.4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2002

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 53 (2/6) (21 - 85)	— C14H 0.1 @ 325°	— 85 (1/2)	<LLD <LLD	0 0	

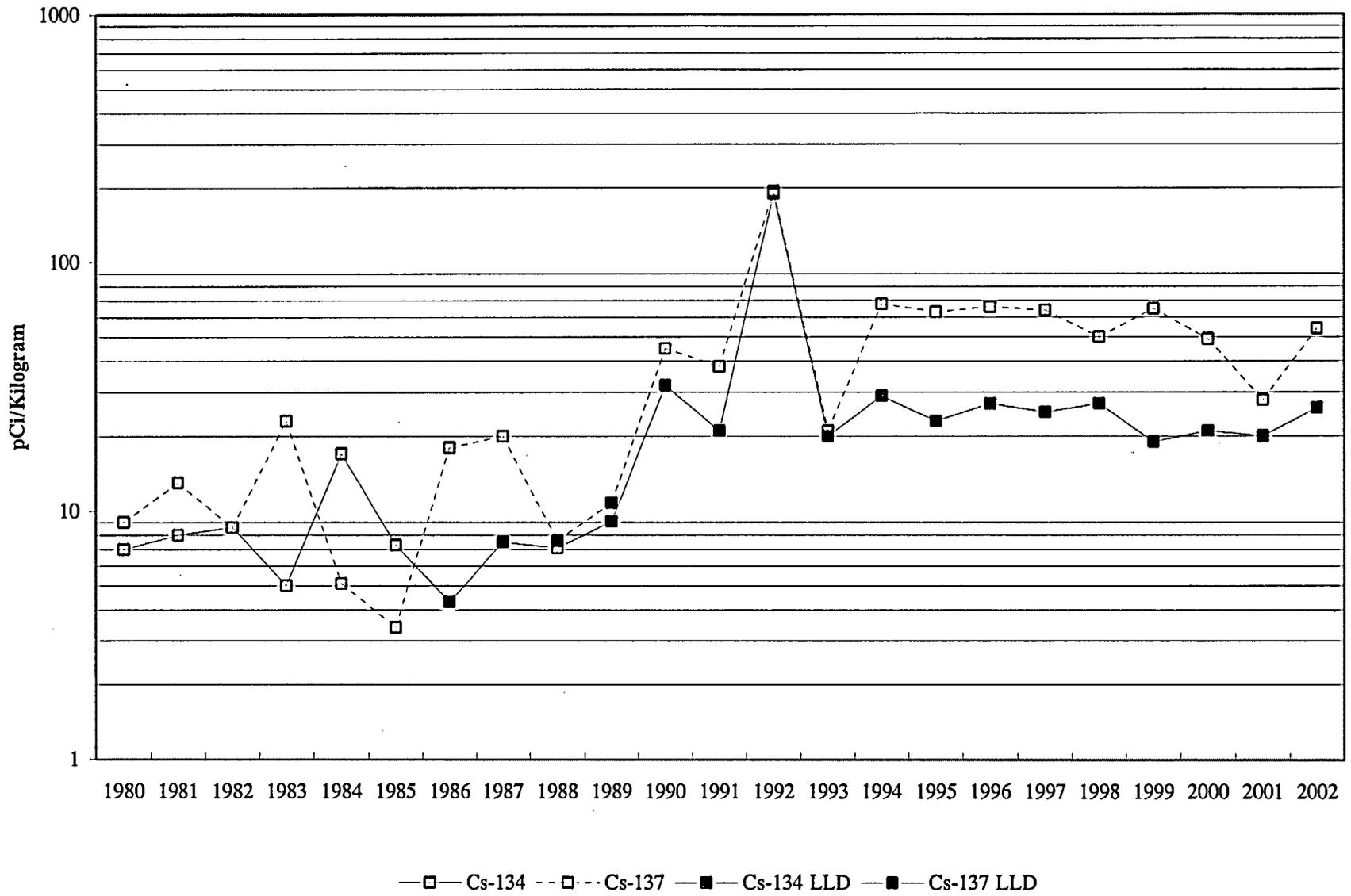
¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-C.4.a
PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002
pCi/kg γ EMITTERS IN SHORELINE SEDIMENT

STATION	PERIOD	Cs-134	Cs-137	Co-58	Co-60	K-40	Ra-226
C09	First Half	<13	<10	<9	<10	236 \pm 51	296 \pm 27
	Second Half	<4	<4	<3	<3	95 \pm 25	146 \pm 4
C14H	First Half	<9	<10	<6	<10	304 \pm 52	557 \pm 25
	Second Half	<26	85 \pm 11	<19	57 \pm 9	1830 \pm 189	897 \pm 25
C14M	First Half	<15	<17	<13	82 \pm 6	290 \pm 74	505 \pm 38
	Second Half	<14	<13	<10	<17	626 \pm 88	460 \pm 15
C14G	First Half	<10	<12	<8	34 \pm 3	349 \pm 54	795 \pm 31
	Second Half	<11	21 \pm 2	<11	44 \pm 2	397 \pm 27	963 \pm 17

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 46 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 two samples at C29, with concentrations of 243 pCi/kg and 65 pCi/kg. This is lower than 2001, during which silver-110m was identified in four samples, with activity ranging from 628 pCi/kg to 3509 pCi/kg. The 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. Six of twenty-four indicator samples had measurable amounts of cesium-137 with an average concentration of 57 pCi/kg and a range of 11 to 111 pCi/kg. This is similar to 2001 results. Four of twelve control station samples had measurable amounts of cesium-137 with an average of 37 pCi/kg and a range of 17 to 68 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.

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, 2002

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>		<u>CONTROL LOCATION</u>	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE	MEAN RANGE	
CARNIVOROUS FISH (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.1.a

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002

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	<21	<22	<45	<27	<45	<25	<28	2899 \pm 248
	2	<32	<28	<60	<36	<67	<29	<32	2618 \pm 238
	3	<42	<46	<82	<49	<100	<48	<46	1970 \pm 210
	4	<19	<19	<39	<22	<39	<18	<22	2284 \pm 197
C30	1	<17	<15	<37	<18	<35	<19	<16	2721 \pm 175
	2	<19	<19	<40	<23	<65	<20	<20	2995 \pm 216
	3	<58	<47	<90	<47	<125	<53	<54	2112 \pm 224
	4	<22	<33	<61	<33	<61	<34	<34	2886 \pm 291

Carnivorous Fish

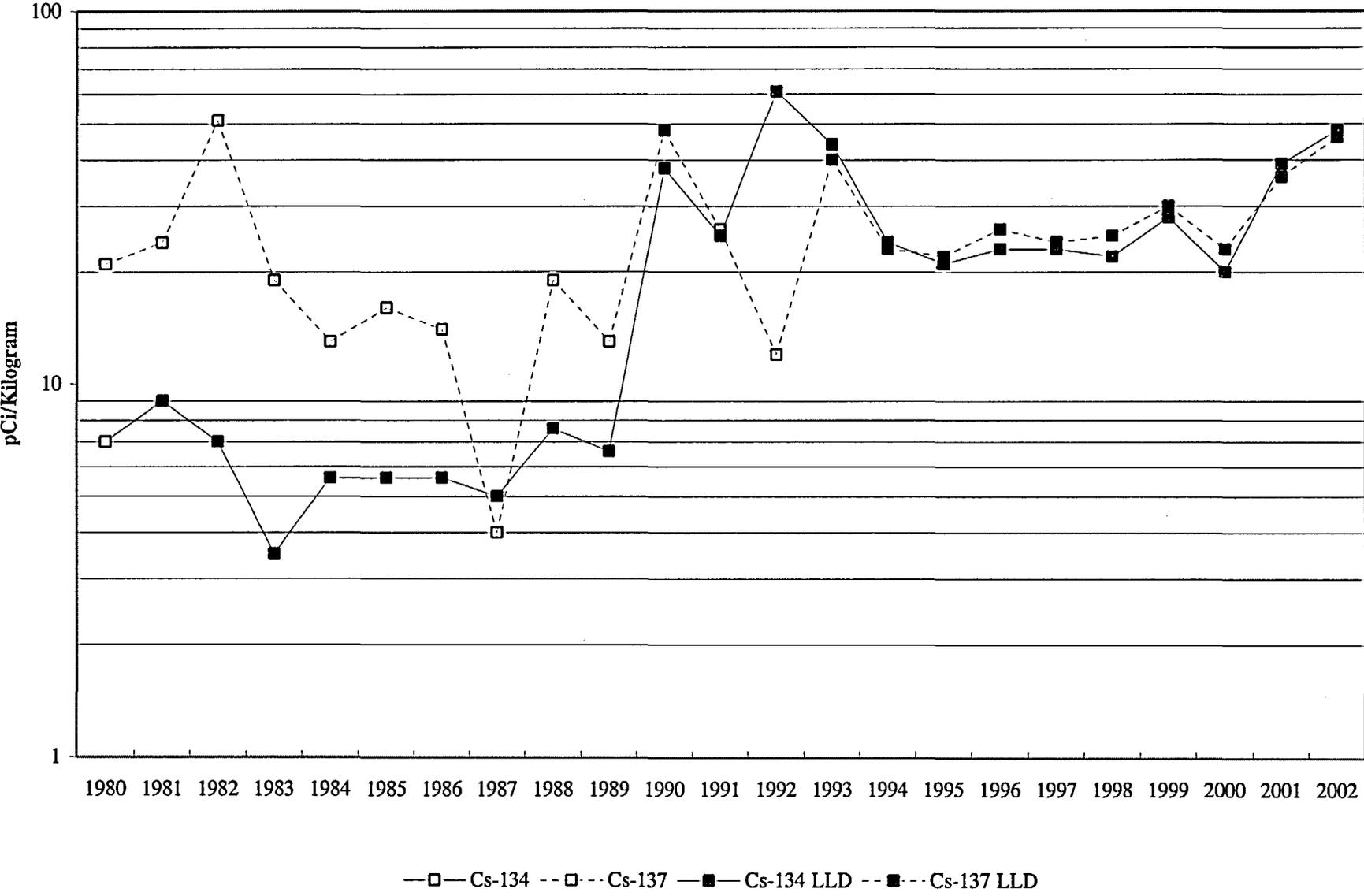


TABLE IV-D.2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2002

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	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE	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 - 2002

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	<22	<29	<49	<29	<67	<26	<34	882 \pm 190
	2	<8	<8	<17	<10	<20	<10	<10	1880 \pm 71
	3	<26	<28	<62	<24	<52	<26	<25	1118 \pm 148
	4	<20	<18	<43	<22	<46	<20	<23	960 \pm 140
C30	1	<24	<21	<40	<19	<42	<25	<24	1129 \pm 155
	2	<13	<11	<26	<17	<36	<14	<15	1954 \pm 131
	3	<47	<44	<78	<46	<100	<45	<52	981 \pm 168
	4	<17	<18	<38	<22	<38	<20	<23	1344 \pm 169

Ag-110m was quantified in two samples taken at station C29, near the end of the discharge canal. Concentrations were 243 pCi/kg (May 14) and 65 pCi/kg (November 6).

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

Oysters

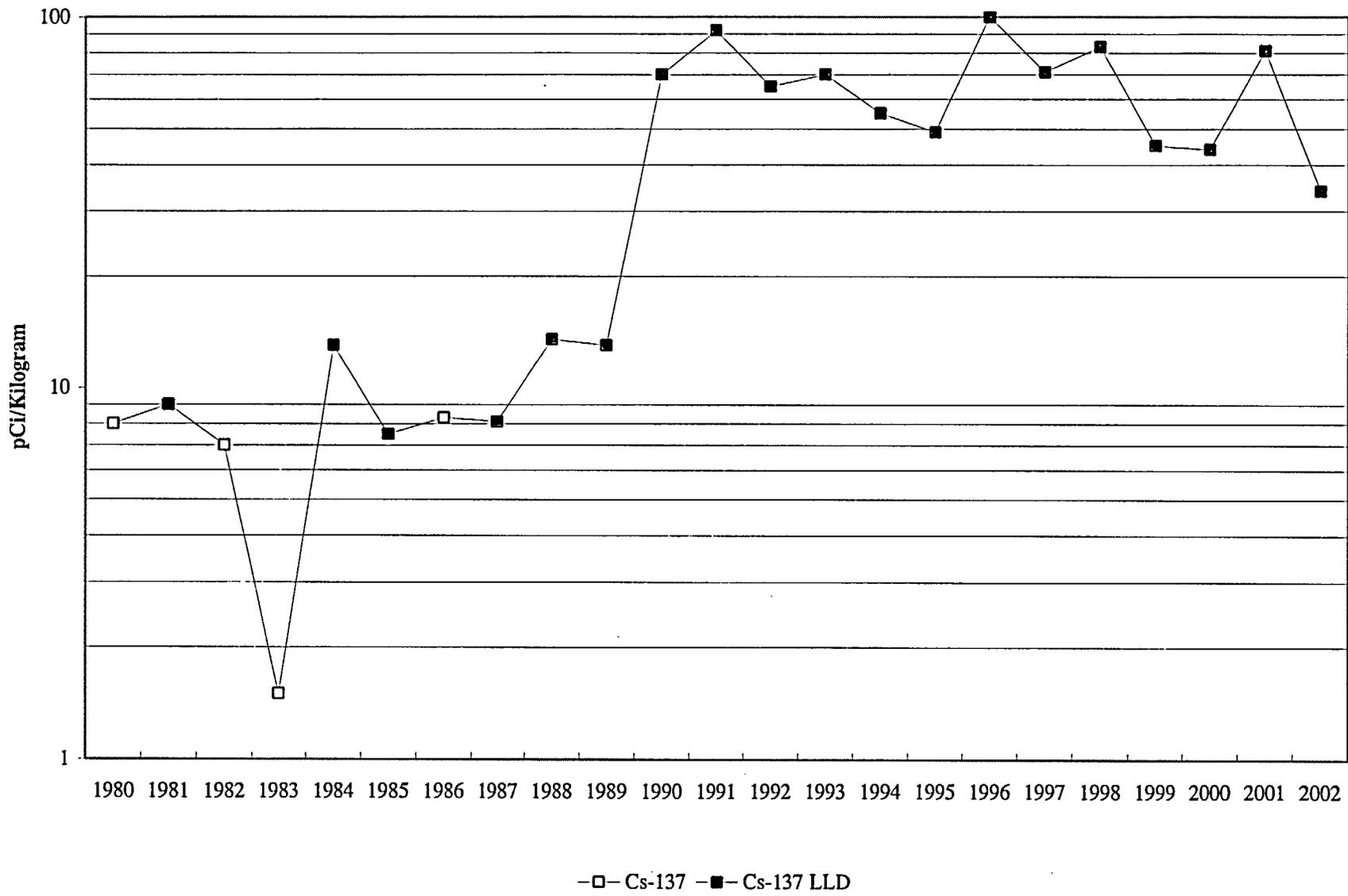


TABLE IV-D.3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2002

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS MEAN RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE & BEARING	MEAN RANGE	CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
BROAD LEAF VEGETATION (pCi/kg)	γ Spec 36						
	I-131	8	<LLD	-	-	<LLD	0
	Cs-134	8	<LLD	-	-	<LLD	0
	Cs-137	8	57 (6/24) (11 - 117)	C48A 0.8 @ 30°	55 (5/12) (11 - 117)	37 (4/12) (17 - 68)	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 - 2002

pCi/kg OF γ EMITTERS IN BROAD LEAF VEGETATION

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C47	JAN	<24	<23	<16	4033 \pm 223
	FEB	<14	<16	<19	5916 \pm 206
	MAR	<22	<14	<13	3571 \pm 154
	APR	<15	<12	68 \pm 8	3306 \pm 145
	MAY	<12	<14	45 \pm 6	3315 \pm 146
	JUN	<14	<16	<13	3638 \pm 187
	JUL	<12	<12	17 \pm 4	2949 \pm 131
	AUG	<16	<14	<17	2933 \pm 174
	SEP	<29	<25	<19	4769 \pm 220
	OCT	<9	<8	<9	2798 \pm 119
	NOV	<15	<17	17 \pm 6	5625 \pm 228
	DEC	<18	<16	<16	2848 \pm 137
C48A	JAN	<27	<18	29 \pm 8	1433 \pm 155
	FEB	<14	<14	<12	1384 \pm 104
	MAR	<20	<13	<12	1772 \pm 117
	APR	<15	<11	<12	1834 \pm 116
	MAY	<12	<12	<13	2266 \pm 128
	JUN	<10	<9	117 \pm 8	3118 \pm 137
	JUL	<11	<11	11 \pm 4	2312 \pm 120
	AUG	<17	<19	26 \pm 6	4240 \pm 200
	SEP	<18	<17	<15	1495 \pm 132
	OCT	<10	<10	92 \pm 9	2041 \pm 102
	NOV	<12	<9	<12	1572 \pm 102
	DEC	<18	<17	<24	4032 \pm 197

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

PROGRESS ENERGY FLORIDA, INC. - CR3 - 2002

pCi/kg OF γ EMITTERS IN BROAD LEAF VEGETATION

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C48B	JAN	<23	<25	53 \pm 16	3555 \pm 278
	FEB	<20	<15	<16	2178 \pm 178
	MAR	<17	<12	<12	1709 \pm 103
	APR	<13	<12	<11	2748 \pm 127
	MAY	<6	<6	<6	3637 \pm 71
	JUN	<5	<6	<7	8300 \pm 103
	JUL	<18	<17	<17	3102 \pm 188
	AUG	<8	<8	<7	3831 \pm 98
	SEP	<21	<16	<21	1986 \pm 162
	OCT	<10	<13	<12	5359 \pm 155
	NOV	<6	<6	<6	4720 \pm 82
	DEC	<11	<12	<11	6195 \pm 189

Broad Leaf Vegetation

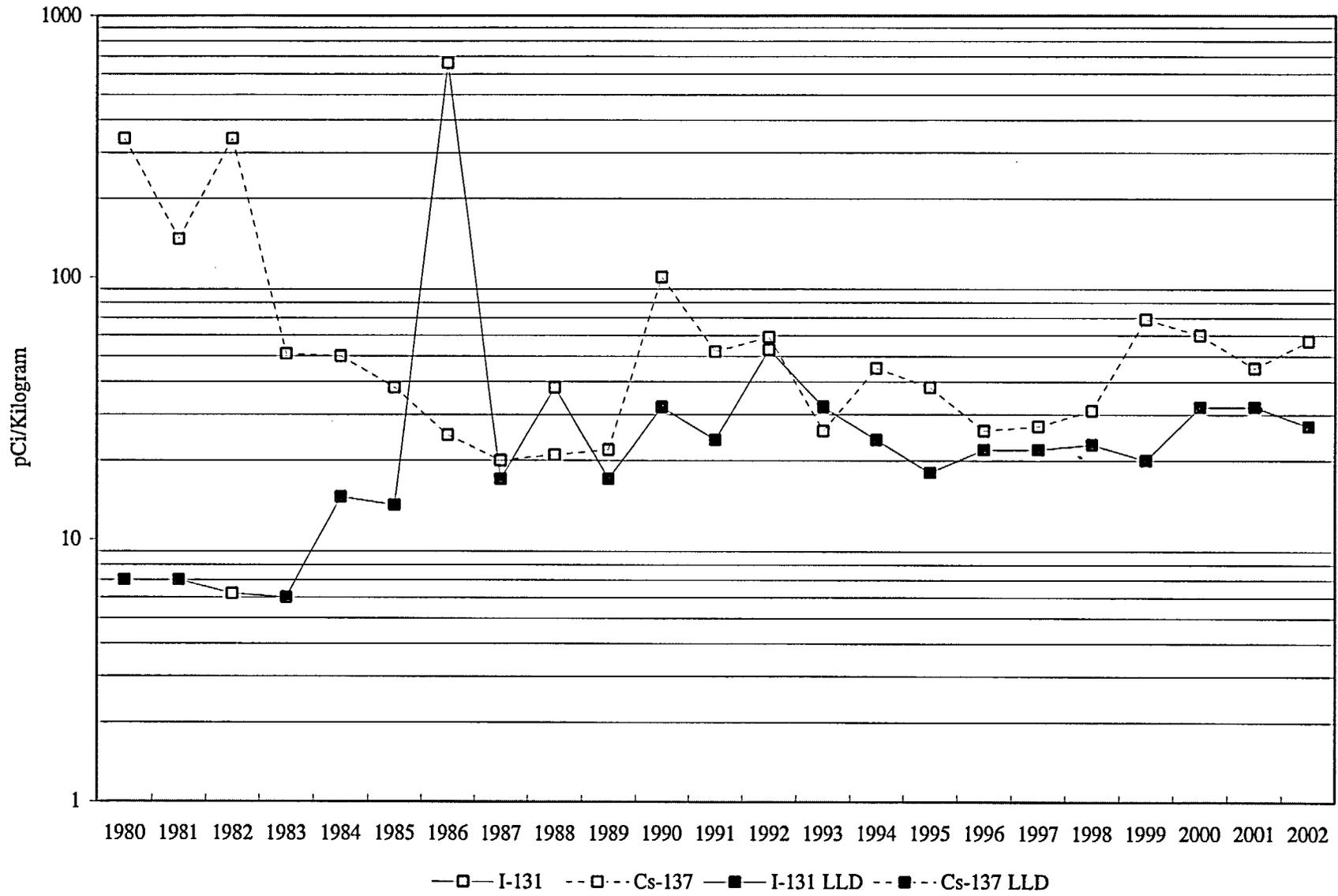


TABLE IV-D.4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2002

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS MEAN RANGE	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
				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	<LLD	-	-	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 - 2002

pCi/kg OF γ EMITTERS IN WATERMELON AND CITRUS

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C04 - Watermelon	June	<5	<6	<7	1424 \pm 69
C19 - Citrus	January	<16	<9	<10	2234 \pm 127