



Florida Power

A Progress Energy Company

Crystal River Nuclear Plant

Docket No. 50-302

Operating License No. DPR-72

Ref: ITS 5.7.1.1(b)

May 13 , 2002

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U.S. Nuclear Regulatory Commission

Attn: Document Control Desk

Washington, DC 20555-0001

Subject: Crystal River Unit 3 – 2001 Annual Radiological Environmental
Operating Report

Dear Sir:

Florida Power Corporation hereby submits the 2001 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, 2001 through December 31, 2001.

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

Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428

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FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
2001

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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 2001 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 2001 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

FLORIDA POWER CORP. - CR3 - 2001

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)
FLORIDA POWER CORP. - CR3 - 2001
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
FLORIDA POWER CORP. - CR3 - 2001
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)
FLORIDA POWER CORP. - CR3 - 2001
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

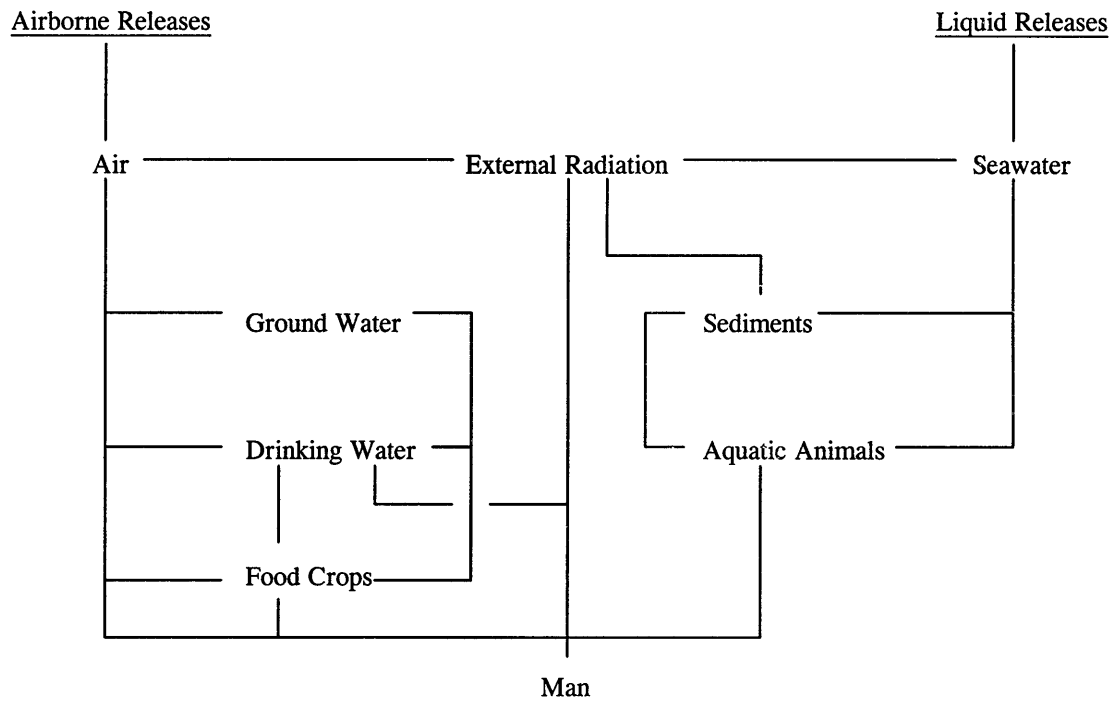


FIGURE I-1: Environmental Media and Exposure Pathways

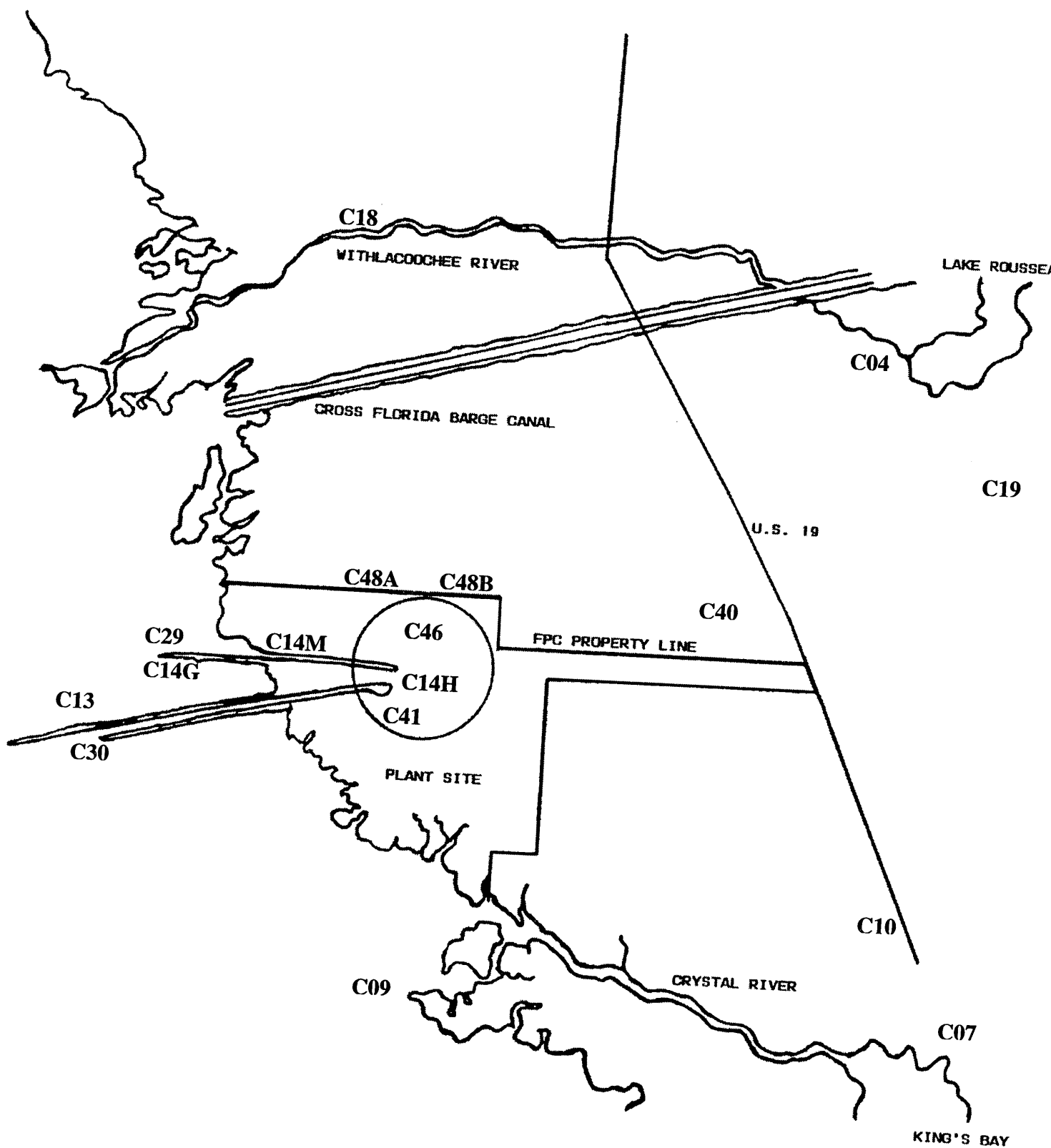
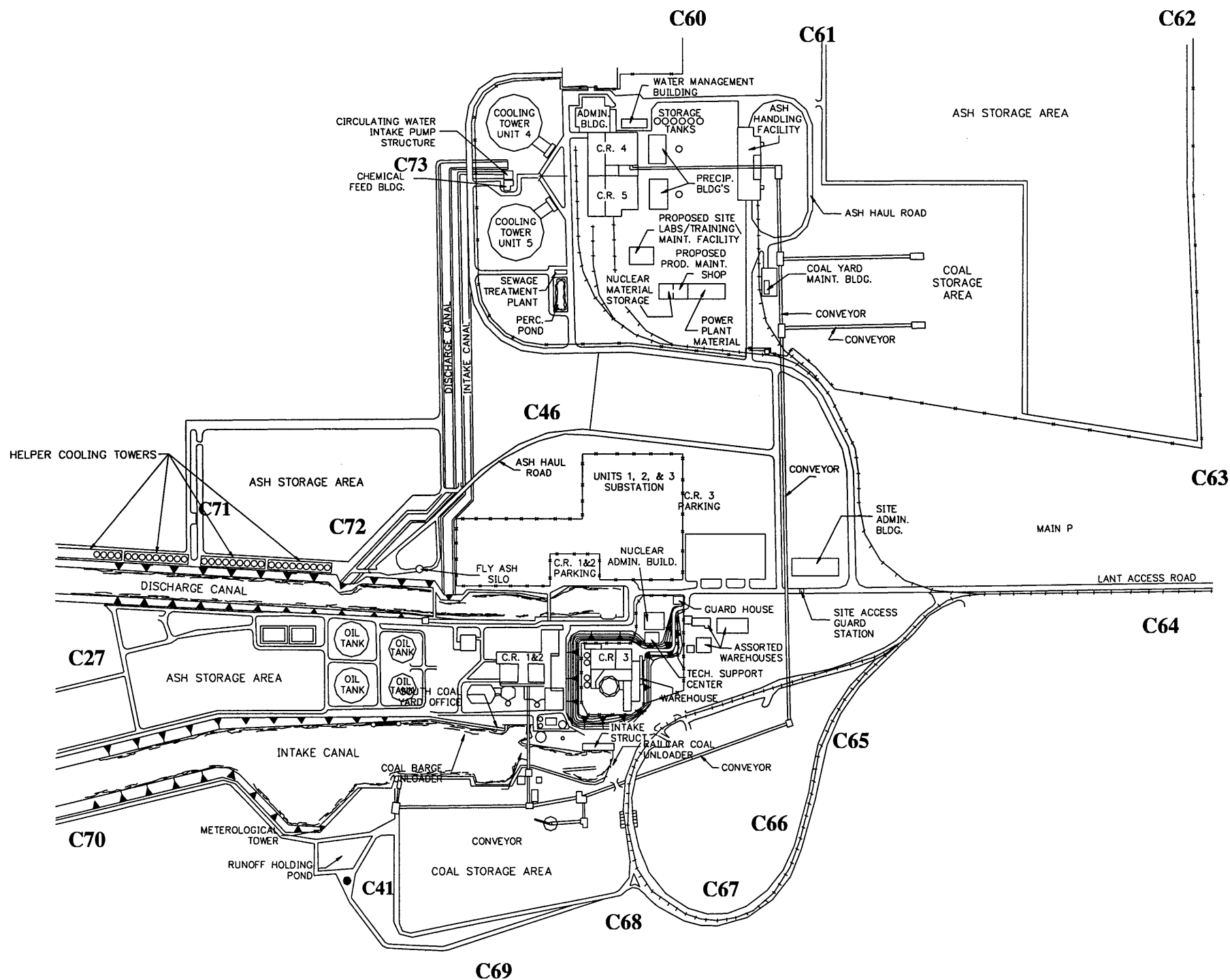


FIGURE I-2: Environmental Monitoring Sample Stations (non-TLDs)

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



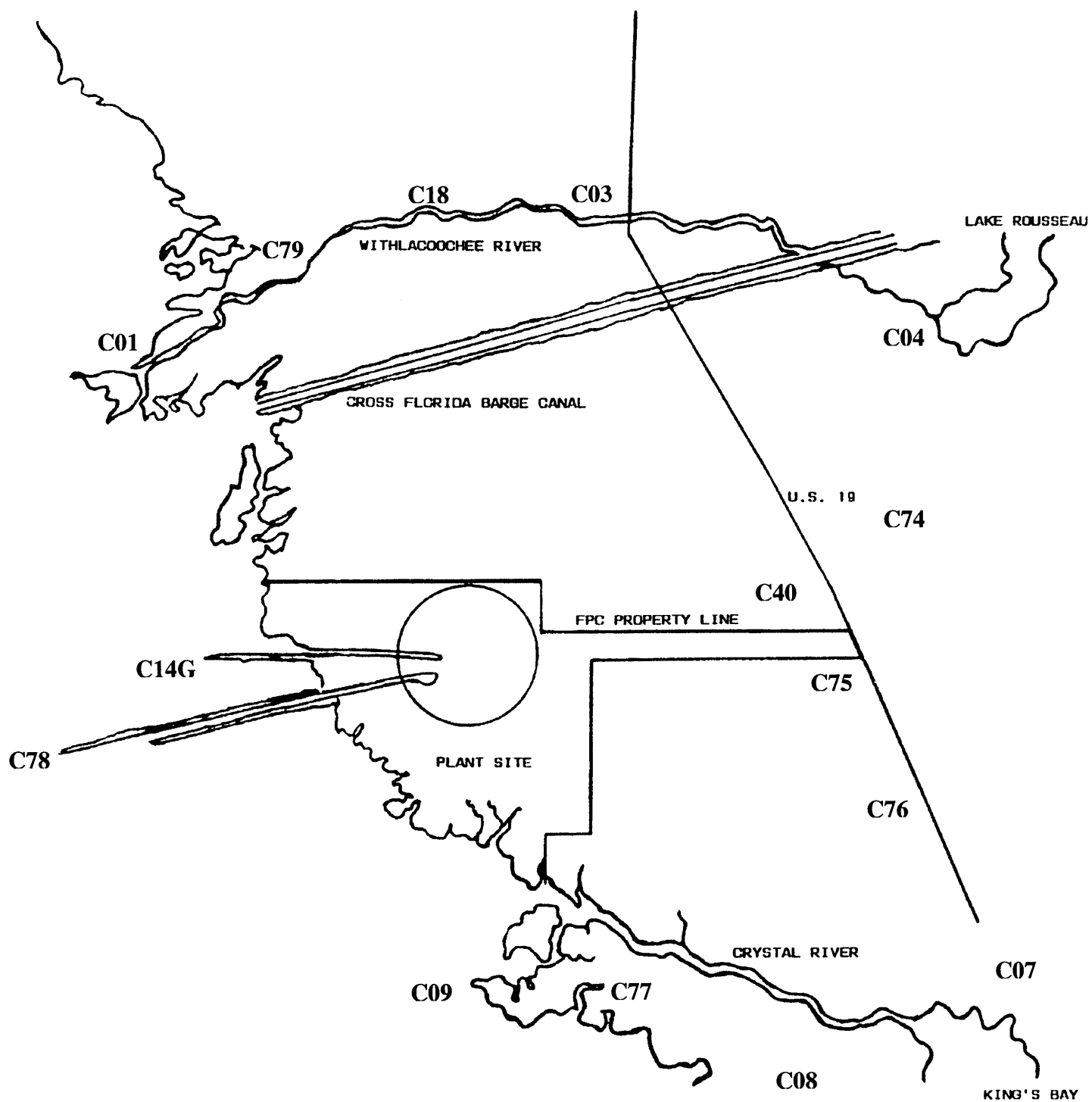


FIGURE I-4: Environmental Monitoring TLD Locations (off site)

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	4.5 @ 5°	*	*
NNE	4.6 @ 18°	4.8 @ 19°	*
NE	3.8 @ 56°	*	*
ENE	3.4 @ 63°		*
E	2.4 @ 96°	*	*
ESE	4.3 @ 105°	4.3 @ 105°	*
SE	4.7 @ 136°	*	*
SSE	3.5 @ 152°	*	*
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

1 pCi = 0.027 Bq

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 2001:

Media	Nuclide	Reported Value	Reported Error	EML Value	EML Error	Reported/EML	Evaluation
Air	Co-60	20.49	0.320	19.44	0.50	1.054	A
Air	Cs-134	2.510	0.060	2.830	0.160	0.887	A
Air	Cs-137	9.950	0.100	8.760	0.340	1.136	A
Air	Gross Beta	3.218	0.083	2.580	0.150	1.247	A
Soil	Cs-137	1915.78	16.97	1740.0	90.00	1.101	A
Soil	K-40	489.68	6.980	468.00	25.00	1.046	A
Vegetation	Co-60	29.32	0.700	30.40	1.200	0.964	A
Vegetation	Cs-137	846.20	3.210	842.0	42.00	1.005	A
Vegetation	K-40	631.46	2.470	603.00	32.00	1.047	A
Water	Co-60	101.13	0.300	98.20	3.600	1.030	A
Water	Cs-137	78.270	0.240	73.00	3.700	1.072	A
Water	H-3	91.58	3.040	79.30	2.000	1.155	A

Results for December 2001:

Media	Nuclide	Reported Value	Reported Error	EML Value	EML Error	Reported/ EML	Evaluation
Air	Co-60	20.93	0.100	17.50	0.470	1.196	W
Air	Cs-134	15.050	0.130	12.950	0.362	1.162	W
Air	Cs-137	23.480	0.150	17.100	0.580	1.373	N
Air	Gross Beta	11.820	0.090	12.770	1.277	0.926	A
Air	Mn-54	109.50	0.580	81.150	4.760	1.349	W
Soil	Cs-137	676.450	2.080	612.330	30.620	1.105	A
Soil	K-40	669.010	4.500	623.330	33.040	1.073	A
Vegetation	Co-60	33.930	0.590	35.300	1.436	0.961	A
Vegetation	Cs-137	1027.6	5.550	1030.0	51.80	0.998	A
Vegetation	K-40	900.600	16.350	898.67	48.23	1.002	A
Water	Co-60	211.12	0.720	209.00	7.590	1.010	A
Water	Cs-137	48.560	0.580	45.133	2.467	1.076	A
Water	H-3	240.230	4.710	207.00	2.690	1.161	A
Water	Ni-63	39.030	0.490	45.250	4.530	0.863	A

An evaluation of the results prompted a review of the calibration of the gamma spectrometer used for analyzing air filters. It was determined that placement of a detector end cap, subsequent to a repair of the detector, biased the efficiency such that QA results were consistently high. This did not affect the results of samples analyzed for Florida Power as none of the filters contained measurable quantities of byproduct material. And although the LLDs for these filters were reported as higher than they would otherwise have been, they were still well within the required LLDs.

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 317 gross beta samples and 317 iodine samples.

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

Of 317 particulate samples analyzed for gross beta activity, 313 had measurable activity. The average indicator concentration was 15 pCi/1000 m³ with a range of 4 to 34 pCi/1000 m³. The average indicator concentration for 1996 through 2000 was 15 pCi/1000 m³. The control location concentration for 2001 averaged 16 pCi/1000 m³, with a range of 3 to 31 pCi/1000 m³.

Three hundred and seventeen 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 C46 during the period 6/11 through 6/19 due to a breaker being opened subsequent to a 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, 2001

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 317 I-131	0.012	<LLD	-	-	<LLD	0
AIRBORNE PARTICULATES (pCi/1000m ³ for Gross β , pCi/1000m ³ for γ Spec)	Gross β 317 γ Spec 24 Cs-134 Cs-137	6.4	15 (260/264) (4 - 34)	C18 5.2 @ 359°	17 (53/53) (4 - 34)	16 (53/53) (3 - 31)	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

FLORIDA POWER CORP. - CR3 - 2001

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
01-02	< .02	< .02	< .02	< .02	< .02	< .02
01-09	< .02	< .01	< .02	< .01	< .02	< .01
01-17	< .01	< .01	< .01	< .01	< .01	< .01
01-23	< .02	< .02	< .02	< .02	< .02	< .02
01-29	< .02	< .02	< .02	< .02	< .02	< .02
02-06	< .01	< .01	< .01	< .01	< .01	< .01
02-13	< .02	< .02	< .02	< .02	< .02	< .01
02-19	< .02	< .02	< .02	< .02	< .02	< .02
02-26	< .02	< .03	< .03	< .02	< .02	< .02
03-05	< .03	< .03	< .03	< .03	< .03	< .03
03-13	< .03	< .03	< .03	< .03	< .03	< .03
03-19	< .03	< .03	< .03	< .02	< .03	< .03
03-26	< .02	< .02	< .02	< .02	< .02	< .02
04-03	< .04	< .01	< .01	< .01	< .01	< .01
04-10	< .03	< .02	< .01	< .01	< .01	< .01
04-17	< .02	< .02	< .02	< .02	< .02	< .02
04-24	< .02	< .02	< .02	< .02	< .02	< .02

TABLE IV-A.2 (Cont'd)
FLORIDA POWER CORP. - CR3 - 2001

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
05-01	< .04	< .04	< .04	< .04	< .04	< .04
05-07	< .03	< .03	< .03	< .03	< .03	< .03
05-14	< .04	< .03	< .03	< .04	< .04	< .03
05-22	< .04	< .04	< .04	< .04	< .04	< .04
05-29	< .02	< .02	< .02	< .02	< .02	< .02
06-04	< .03	< .03	< .03	< .03	< .03	< .03
06-11	< .03	< .03	< .03	< .03	< .06	< .03
06-19	< .02	< .02	< .02	< .02	---	< .02
06-26	< .03	< .03	< .03	< .03	< .04	< .03
07-02	< .05	< .05	< .05	< .05	< .05	< .05
07-09	< .02	< .02	< .02	< .02	< .02	< .02
07-17	< .02	< .02	< .02	< .02	< .02	< .02
07-23	< .03	< .03	< .03	< .03	< .03	< .03
07-30	< .03	< .03	< .03	< .03	< .03	< .03
08-07	< .01	< .01	< .01	< .01	< .01	< .01
08-14	< .02	< .02	< .01	< .01	< .01	< .02
08-21	< .02	< .02	< .02	< .02	< .02	< .01
08-27	< .02	< .02	< .02	< .02	< .02	< .03

TABLE IV-A.2 (Cont'd)
FLORIDA POWER CORP. - CR3 - 2001

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
09-04	< .02	< .02	< .02	< .02	< .02	< .02
09-11	< .02	< .02	< .02	< .02	< .02	< .02
09-18	< .03	< .03	< .03	< .03	< .03	< .03
09-25	< .02	< .02	< .02	< .02	< .02	< .02
10-02	< .02	< .02	< .02	< .02	< .02	< .02
10-09	< .03	< .03	< .03	< .03	< .03	< .03
10-16	< .02	< .02	< .02	< .02	< .02	< .02
10-22	< .02	< .02	< .02	< .02	< .02	< .02
10-30	< .01	< .01	< .01	< .01	< .01	< .01
11-06	< .04	< .04	< .04	< .04	< .04	< .04
11-14	< .02	< .02	< .02	< .02	< .02	< .02
11-20	< .04	< .04	< .04	< .04	< .04	< .04
11-27	< .03	< .03	< .03	< .03	< .03	< .03
12-04	< .02	< .02	< .02	< .02	< .02	< .02
12-11	< .02	< .02	< .02	< .02	< .02	< .02
12-18	< .02	< .02	< .02	< .02	< .02	< .02
12-24	< .03	< .03	< .03	< .03	< .03	< .03
12-31	< .03	< .03	< .03	< .03	< .03	< .03

TABLE IV-A.3
FLORIDA POWER CORP. - CR3 - 2001

pCi/1000m³ GROSS β IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
01-02	16	17	10	18	15	15
01-09	22	23	13	21	19	15
01-17	10	15	09	13	17	15
01-23	16	15	10	14	10	17
01-29	20	26	23	22	19	26
02-06	17	16	17	22	18	21
02-13	14	15	11	15	12	15
02-19	10	14	15	11	16	15
02-26	17	17	14	22	16	19
03-05	12	10	8	7	7	6
03-13	20	21	15	14	22	20
03-19	16	17	8	16	13	16
03-26	12	14	10	9	11	16
04-03	14	11	14	14	12	16
04-10	14	16	16	12	16	17
04-17	13	14	14	13	17	18
04-24	16	14	14	18	14	18

TABLE IV-A.3 (Cont'd)
FLORIDA POWER CORP. - CR3 - 2001

pCi/1000m³ GROSS β IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
05-01	19	21	17	17	23	19
05-07	25	27	20	23	23	23
05-14	13	13	17	13	13	15
05-22	12	25	23	24	20	24
05-29	22	20	19	16	20	24
06-04	15	15	18	18	19	17
06-11	13	15	9	15	8	16
06-19	18	22	20	25	--	17
06-26	12	17	14	13	10	11
07-02	6	7	5	10	6	4
07-09	10	10	16	13	11	10
07-17	12	14	11	14	11	11
07-23	9	11	6	10	9	7
07-30	10	7	12	8	11	9
08-07	9	8	8	11	10	11
08-14	11	12	5	7	10	8
08-21	6	10	10	8	10	12
08-27	13	19	15	20	18	19

TABLE IV-A.3 (Cont'd)
FLORIDA POWER CORP. - CR3 - 2001

pCi/1000m³ GROSS β IN AIR

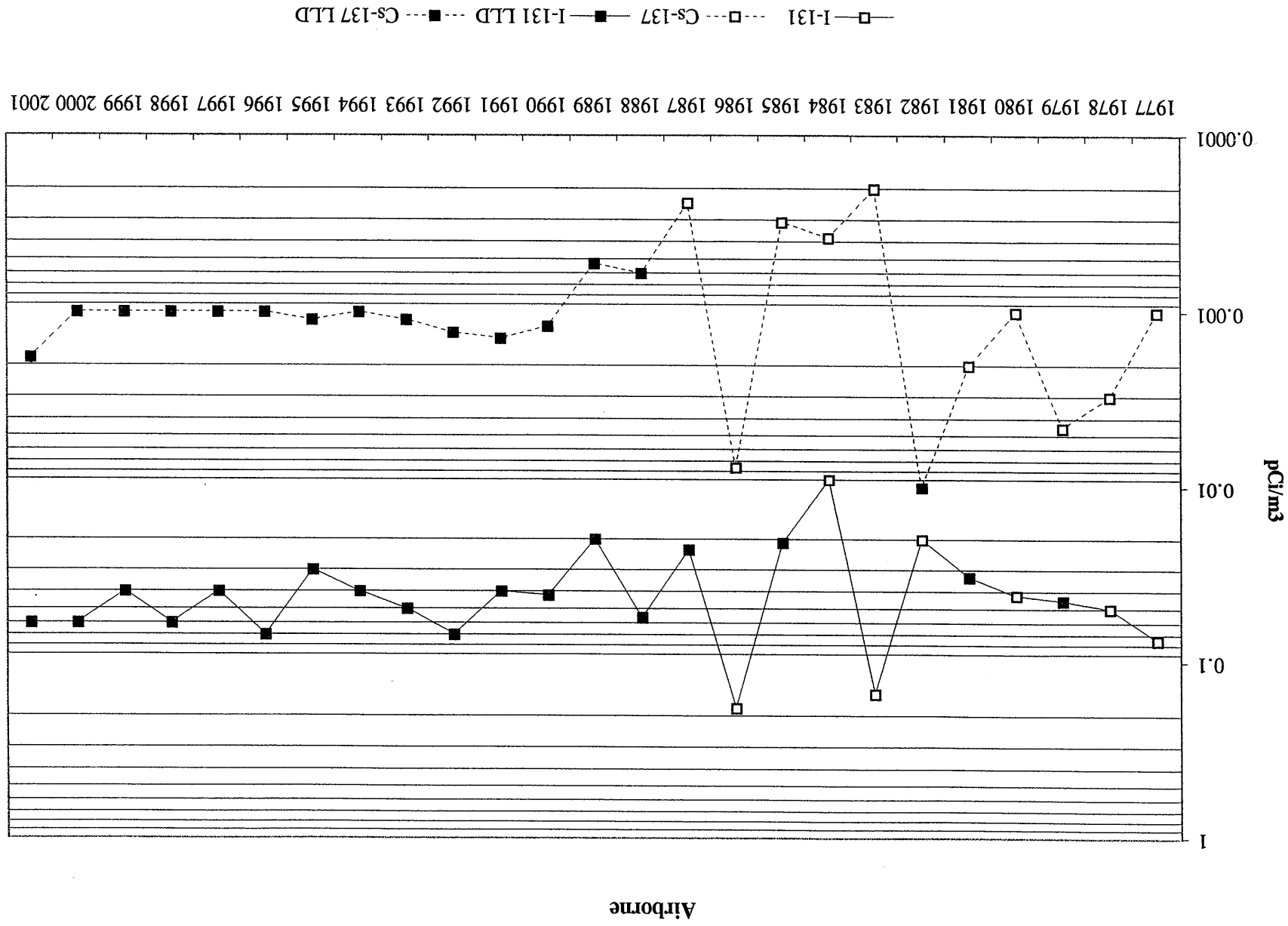
COLLECTION DATE	C07	C18	C40	C41	C46	C47
09-04	15	15	10	15	12	13
09-11	5	4	<7	<7	<7	3
09-18	7	10	9	11	10	10
09-25	6	16	11	13	14	17
10-02	17	17	18	20	22	16
10-09	16	19	18	19	16	14
10-16	12	14	10	16	11	8
10-22	6	11	4	12	11	10
10-30	11	13	10	14	12	10
11-06	21	20	13	23	14	14
11-14	29	28	22	34	23	31
11-20	22	27	20	25	24	18
11-27	18	28	16	27	18	27
12-04	18	24	16	17	19	19
12-11	11	13	6	12	6	7
12-18	5	11	8	9	8	11
12-24	22	29	28	26	28	30
12-31	28	34	32	31	34	28

TABLE IV-A.4

FLORIDA POWER CORP. - CR3 - 2001

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

STATION	NUCLIDE	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
C07	Be-7	125	158	117	118
	K-40	<22	<26	<30	<28
	Cs-134	<1.1	<1.6	<1.6	<1.2
	Cs-137	<0.9	<1.8	<1.2	<1.2
C18	Be-7	109	159	117	119
	K-40	<18	<28	<26	<28
	Cs-134	<0.9	<1.7	<1.1	<1.6
	Cs-137	<0.8	<1.4	<1.3	<1.2
C40	Be-7	88	146	100	134
	K-40	<18	<23	<28	<26
	Cs-134	<1.2	<1.5	<1.3	<1.4
	Cs-137	<1.0	<1.4	<0.9	<1.7
C41	Be-7	106	170	150	177
	K-40	<20	<27	<23	<27
	Cs-134	<1.0	<1.8	<1.2	<1.3
	CS-137	<0.9	<1.3	<1.1	<1.3
C46	Be-7	90	152	107	144
	K-40	<20	<24	<26	<25
	Cs-134	<1.0	<2.0	<1.2	<1.2
	Cs-137	<0.9	<1.6	<0.8	<1.0
C47	Be-7	108	165	135	164
	K-40	<21	<29	<31	<25
	Cs-134	<1.0	<1.3	<0.8	<1.8
	Cs-137	<0.8	<1.7	<1.5	<1.1



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 2001; the third quarter TLD from station C78 was wet at the time of collection, invalidating its results.

The highest on-site dose was 125 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 72 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 48 mrem/yr. The average for all stations was 57 mrem/yr for 2001 and 58 mrem/yr for 2000. 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, 2001

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)	<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		
DIRECT RADIATION (mrem/yr)	γ DOSE 131	15	57 (127/128) (39 - 128)	C71 0.7 @ 280°	125 (4/4) (121 - 128)	48 (4/4) (45 - 50)	0

TABLE IV-B.1

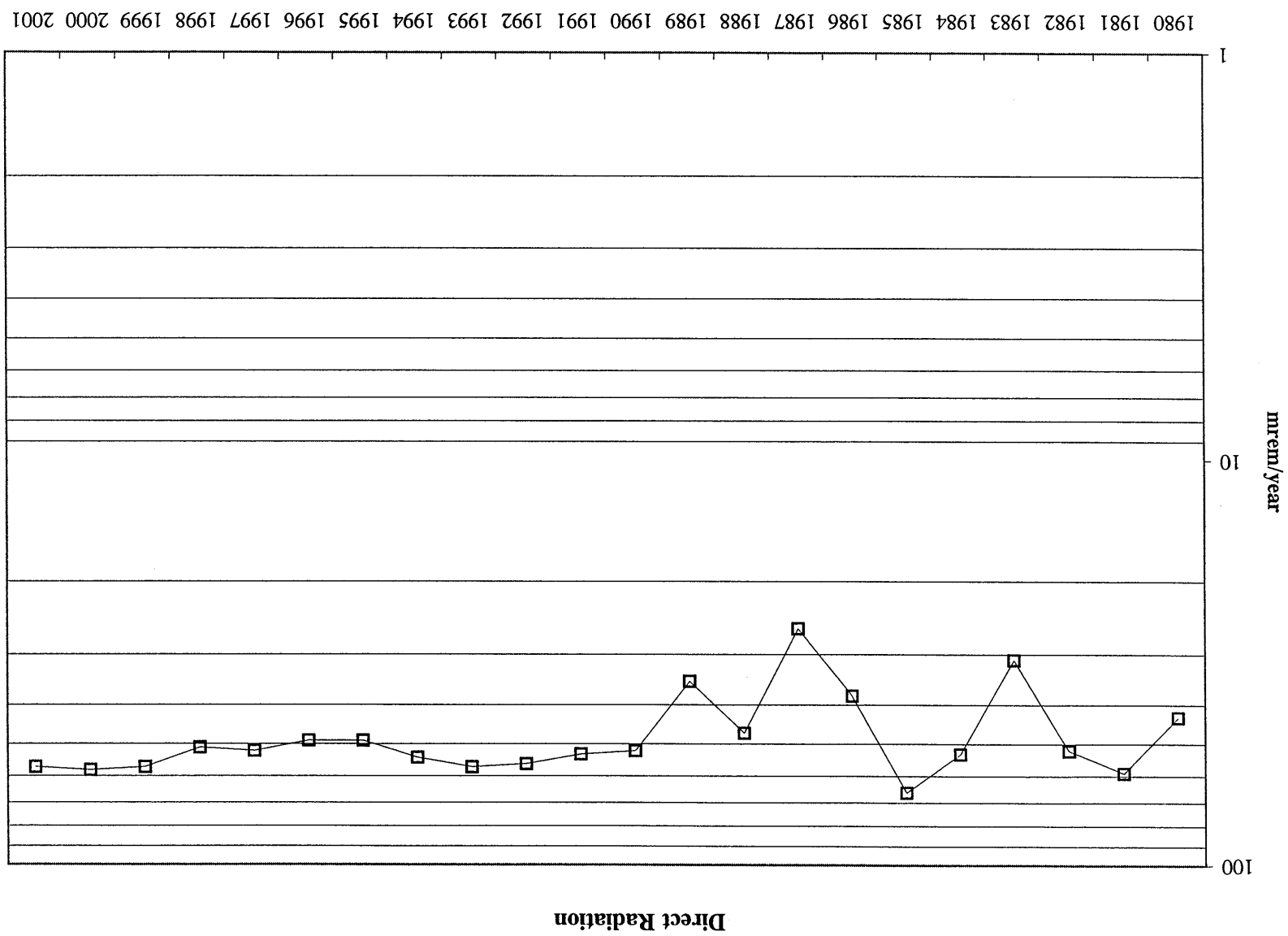
FLORIDA POWER CORP. - CR-3 - 2001

mrem/yr γ Dose

TLD STATION	Quarter	1	2	3	4
CO1		44	46	45	46
CO3		45	45	47	44
CO4		44	50	46	46
CO7*		45	45	43	42
CO8		44	44	44	42
C09		43	43	44	39
C14G		53	54	54	52
C18		48	49	49	46
C27		67	68	67	67
C40*		60	61	62	60
C41		54	58	60	57
C46*		55	57	52	55
C47 (CONTROL)		45	50	49	46
C60		54	56	56	53
C61		58	59	64	59
C62		67	68	67	65
C63		60	62	54	60
C64		58	61	59	60
C65		67	78	77	66
C66		60	63	65	60
C67		59	60	60	58
C68		58	62	59	55
C69		61	65	60	60
C70		63	68	66	64
C71		121	128	127	123
C72		60	60	60	61
C73		55	57	55	53
C74		43	46	43	41
C75		56	57	55	54
C76		53	53	52	55
C77		40	39	41	39
C78		46	48	--	43
C79		51	49	47	49

*TLDs not required by the ODCM.

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



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, five had measurable tritium at an average concentration of 185 pCi/L. The sample with the highest concentration of tritium, 379 pCi/L, was obtained in January at station C14G near the end of the discharge canal. The seawater tritium activity is consistent with concentration of tritium in the liquid waste stream. Four control station sample contained tritium at a concentration of 179 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 160 pCi/L for tritium and 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 30 pCi/L for 2001, as compared to 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 28 pCi/L for 2001, as compared to 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, 2001

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		
SEAWATER (pCi/L)	Tritium 36	131	185 (5/24) (108-379)	C14G 2.8 @ 270°	218 (3/12) (121-379)	179 (4/12) (82 - 339)	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

FLORIDA POWER CORP. - CR3 - 2001

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	208 \pm 24	340 \pm 35	<4	<4	<10	<3	<8	<7	<8	<5	<5	<5
	FEB	339 \pm 26	310 \pm 30	<3	<4	<8	<4	<8	<6	<5	<4	<4	<5
	MAR	<122	308 \pm 16	<2	<2	<3	<2	<4	<3	<2	<2	<2	<4
	APR	82 \pm 40	278 \pm 33	<3	<3	<7	<4	<6	<7	<6	<4	<4	<6
	MAY	88 \pm 39	274 \pm 43	<5	<6	<11	<7	<12	<9	<5	<6	<5	<12
	JUN	<120	252 \pm 42	<6	<6	<12	<6	<11	<12	<8	<6	<5	<8
	JUL	<119	295 \pm 53	<5	<4	<8	<6	<11	<11	<9	<7	<6	<5
	AUG	<122	289 \pm 33	<3	<5	<7	<4	<9	<6	<4	<4	<4	<9
	SEP	<121	245 \pm 35	<4	<4	<6	<5	<9	<6	<6	<5	<4	<6
	OCT	<123	315 \pm 32	<4	<5	<9	<4	<9	<8	<8	<5	<4	<6
	NOV	<120	252 \pm 35	<3	<4	<9	<6	<10	<6	<8	<5	<4	<5
	DEC	<119	267 \pm 31	<2	<3	<8	<4	<8	<7	<4	<4	<4	<7
C14G	JAN	379 \pm 26	298 \pm 30	<3	<3	<7	<3	<8	<6	<8	<5	<4	<6
	FEB	153 \pm 24	278 \pm 16	<2	<2	<3	<2	<3	<3	<3	<2	<2	<2
	MAR	<122	291 \pm 29	<3	<4	<6	<4	<9	<7	<5	<5	<4	<9
	APR	121 \pm 41	303 \pm 30	<3	<4	<7	<4	<6	<6	<6	<4	<4	<5
	MAY	<121	305 \pm 23	<2	<2	<5	<3	<5	<4	<3	<3	<3	<5
	JUN	<120	321 \pm 23	<2	<3	<6	<3	<5	<5	<4	<3	<3	<4
	JUL	<119	359 \pm 33	<4	<4	<8	<5	<9	<6	<6	<5	<4	<6
	AUG	<122	239 \pm 32	<4	<4	<6	<5	<7	<7	<4	<4	<5	<7
	SEP	<121	301 \pm 15	<2	<2	<3	<2	<4	<3	<2	<2	<2	<3
	OCT	<123	305 \pm 30	<4	<4	<8	<4	<7	<9	<8	<4	<4	<6
	NOV	<120	281 \pm 34	<4	<3	<8	<4	<10	<8	<6	<4	<4	<6
	DEC	<119	313 \pm 37	<3	<5	<8	<4	<8	<7	<5	<4	<4	<8

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

FLORIDA POWER CORP. - CR3 - 2001

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	166 \pm 42	296 \pm 30	<4	<4	<8	<3	<10	<8	<11	<4	<4	<6
	FEB	<123	289 \pm 31	<3	<4	<7	<3	<9	<6	<6	<5	<4	<4
	MAR	<122	266 \pm 15	<2	<2	<3	<2	<4	<3	<2	<2	<2	<3
	APR	108 \pm 40	258 \pm 30	<4	<4	<7	<4	<8	<6	<6	<5	<4	<5
	MAY	<121	250 \pm 41	<7	<4	<14	<6	<12	<9	<8	<6	<5	<9
	JUN	<120	284 \pm 22	<3	<2	<6	<3	<5	<4	<3	<3	<3	<4
	JUL	<119	315 \pm 39	<5	<4	<14	<6	<11	<9	<9	<6	<5	<9
	AUG	<122	235 \pm 31	<3	<4	<7	<4	<8	<7	<5	<3	<4	<5
	SEP	<121	246 \pm 32	<4	<4	<9	<4	<8	<7	<4	<5	<4	<7
	OCT	<123	319 \pm 16	<2	<2	<4	<2	<3	<3	<4	<2	<2	<3
	NOV	<120	240 \pm 32	<4	<4	<8	<4	<9	<6	<9	<4	<4	<6
	DEC	<119	290 \pm 35	<4	<4	<10	<4	<8	<7	<5	<5	<4	<5

Seawater

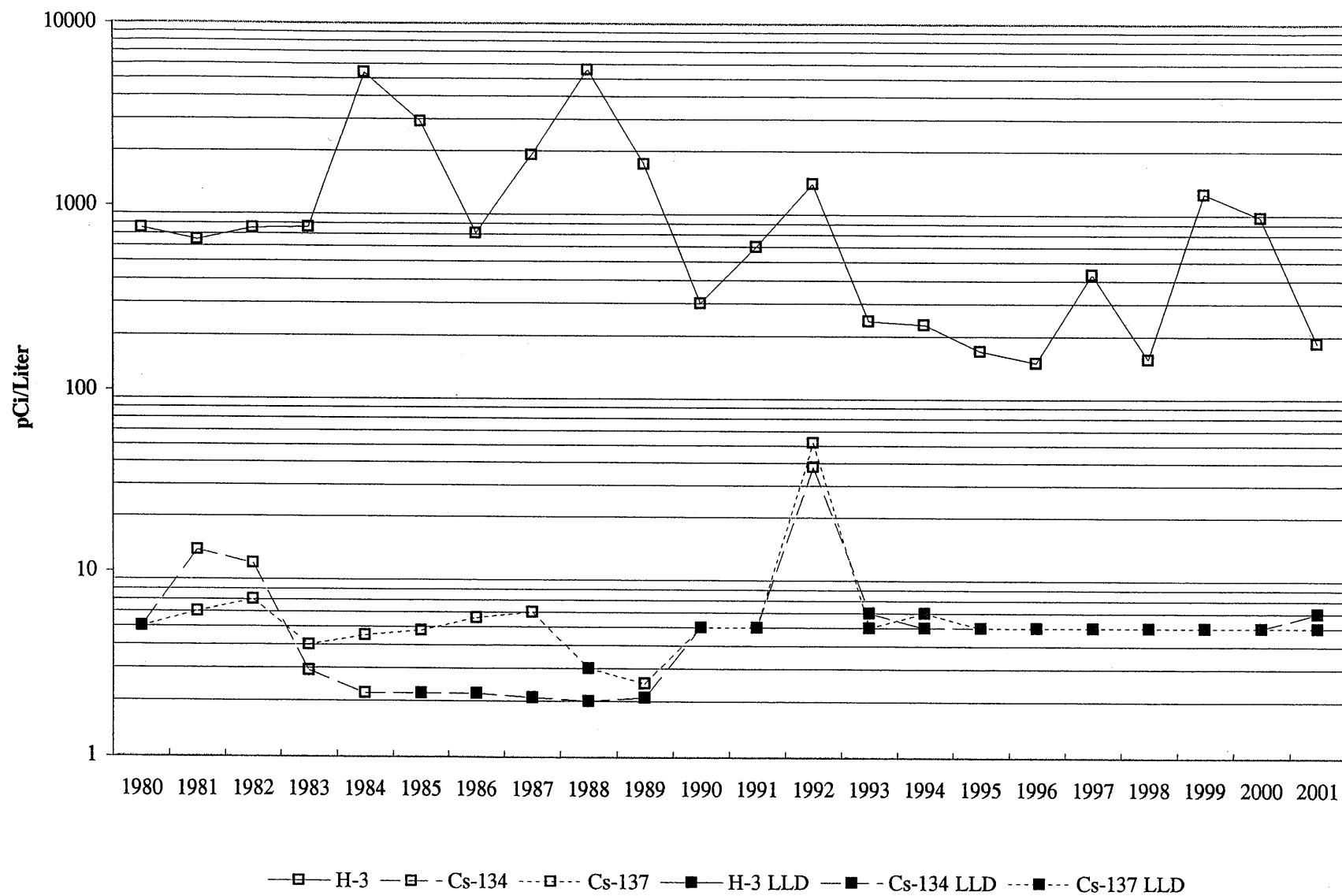


TABLE IV-C.2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2001

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		
GROUND	Tritium 2	155	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

FLORIDA POWER CORP. - CR3 - 2001

pCi/L γ EMITTERS AND TRITIUM IN GROUND WATER

STATION	NUCLIDE	FIRST HALF	SECOND HALF
C40	H-3	<123	<122
	Mn-54	<3	<6
	Fe-59	<8	<11
	Co-58	<4	<5
	Co-60	<3	<6
	Zn-65	<5	<11
	Zr-Nb-95	<7	<6
	I-131	<5	<4
	Cs-134	<3	<7
	Cs-137	<4	<6
	Ba-La-140	<5	<10
	K-40	96 \pm 18	<96

Ground Water

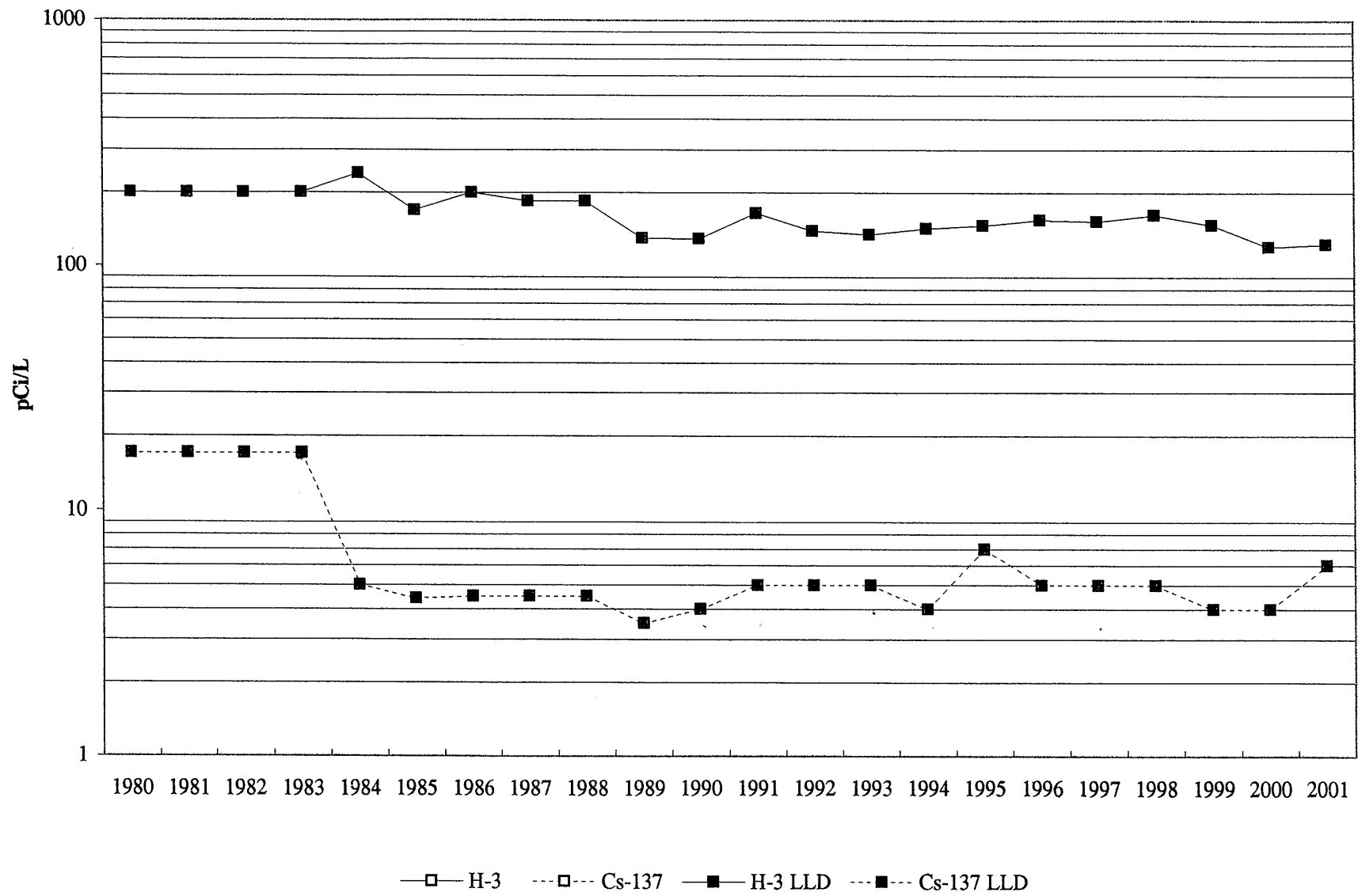


TABLE IV-C.3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2001

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		
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

FLORIDA POWER CORP. - CR3 - 2001

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	01-04	<125	<56	<4	<4	<6	<3	<8	<6	<11	<3	<4	<6
	04-03	<124	<55	<2	<2	<3	<2	<3	<3	<3	<2	<2	<2
	07-05	<119	<80	<5	<5	<11	<5	<10	<10	<9	<4	<6	<7
	10-09	<123	<55	<5	<4	<7	<4	<8	<7	<5	<5	<4	<9
C10	01-04	<125	<55	<4	<4	<6	<3	<8	<6	<11	<3	<4	<6
	04-03	<124	<55	<3	<3	<6	<3	<7	<6	<6	<4	<3	<5
	07-05	<119	<60	<4	<4	<9	<4	<9	<9	<7	<3	<5	<8
	10-09	<123	<28	<2	<2	<3	<2	<4	<3	<2	<2	<2	<4
C18	01-04	<125	<12	<2	<2	<4	<1	<3	<3	<4	<2	<1	<3
	04-03	<124	<21	<1	<1	<3	<1	<3	<3	<3	<1	<2	<2
	07-05	<119	<52	<3	<4	<6	<4	<9	<6	<6	<5	<4	<6
	10-09	<123	<57	<3	<4	<6	<4	<7	<5	<5	<5	<4	<10

Drinking Water

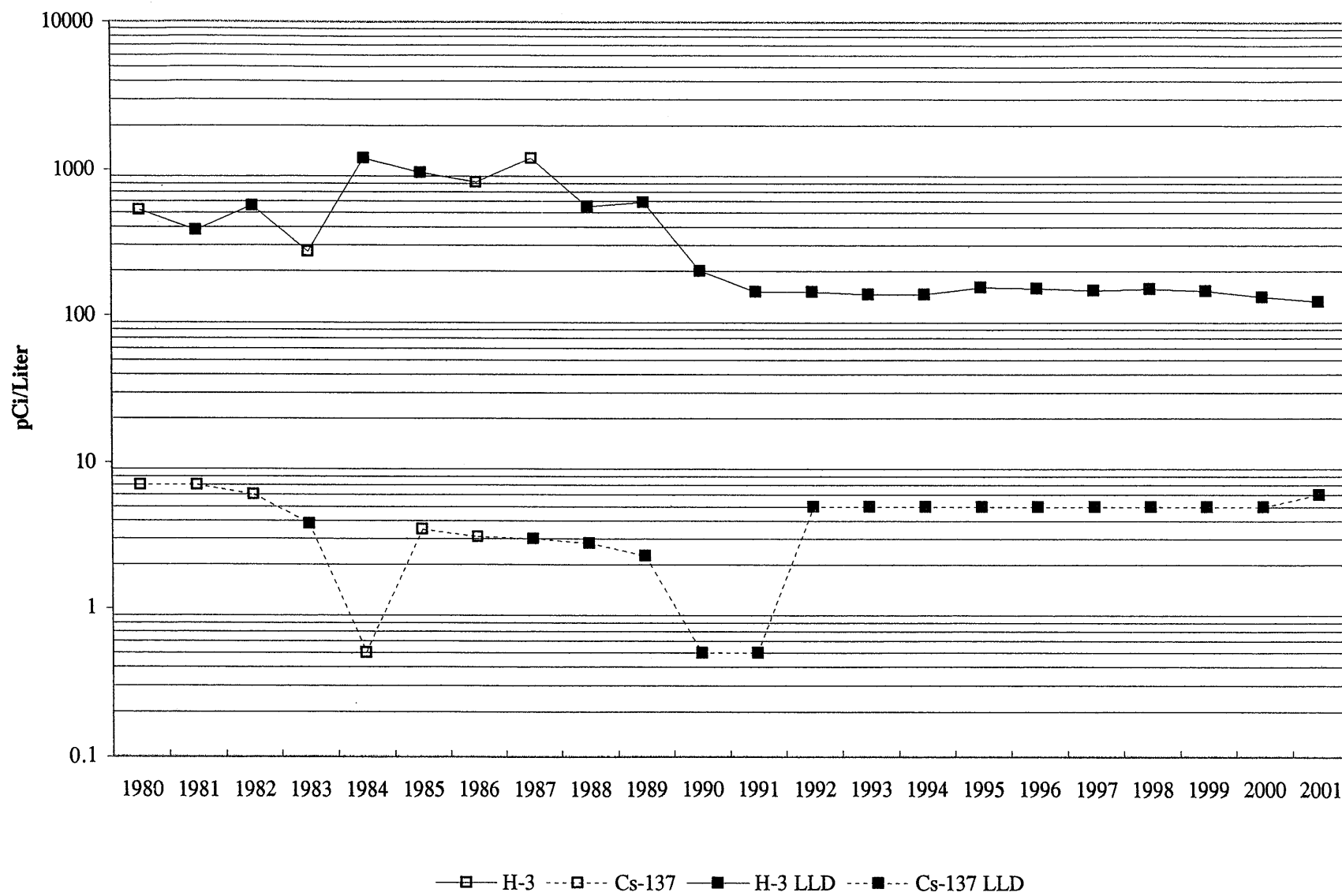


TABLE IV-C.4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2001

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	γ Spec 8						
SEDIMENT							
(pCi/kg)	Cs-134	7	<LLD	—	—	<LLD	0
	Cs-137	7	28 (4/6)	C14H	78 (2/2)	<LLD	0
			(6 - 64)	0.1 @ 315°	(12 - 64)		

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

TABLE IV-C.4.a

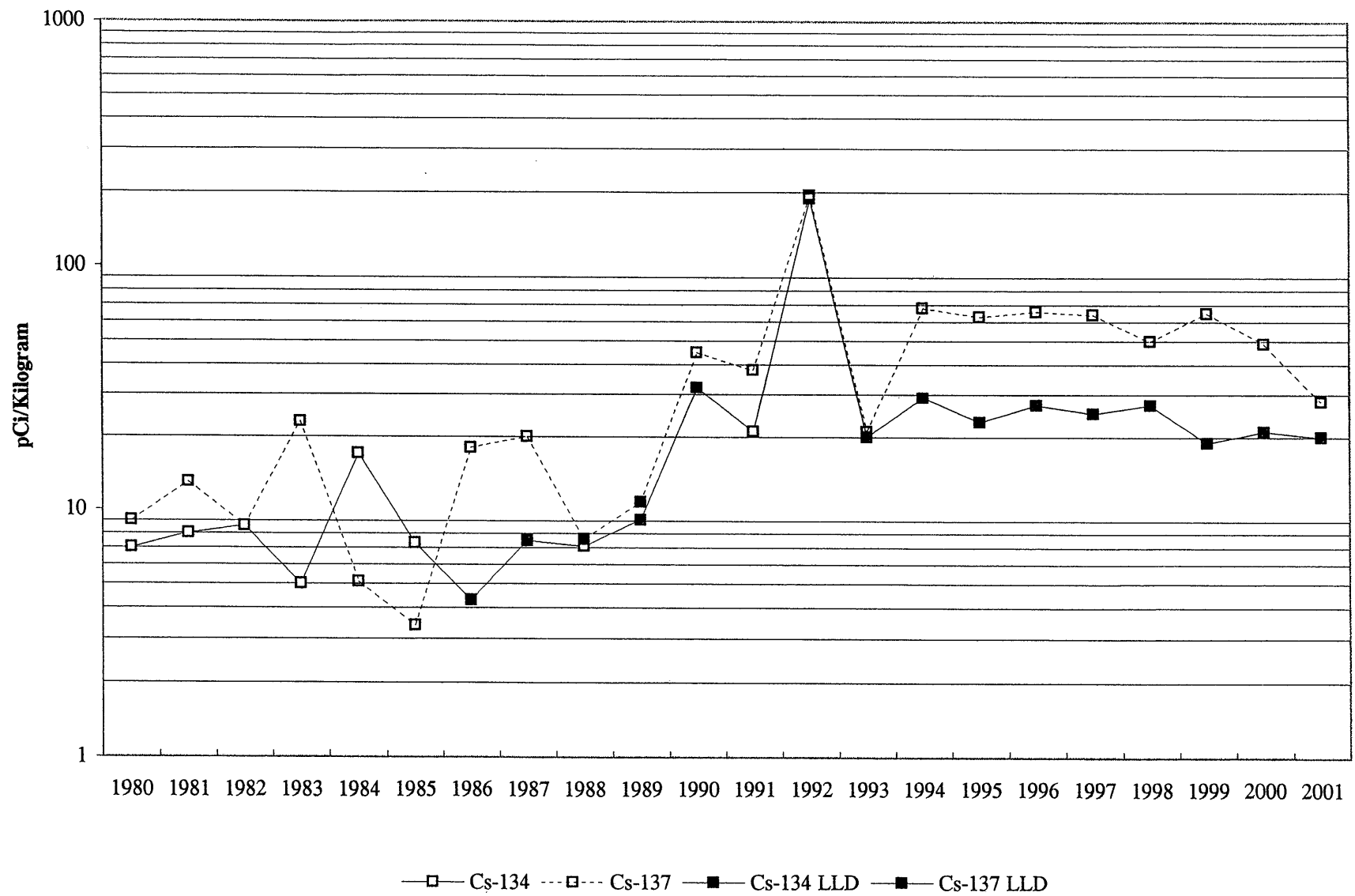
FLORIDA POWER CORP. - CR3 - 2001

pCi/kg γ EMITTERS IN SHORELINE SEDIMENT

STATION	PERIOD	Cs-134	Cs-137	Co-58	Co-60	K-40	Ra-226
C09	First Half	<4	<4	<3	<3	393 \pm 22	313 \pm 10
	Second Half	<6	<6	<6	<5	171 \pm 32	234 \pm 16
C14H	First Half	<20	64 \pm 9	<13	80 \pm 7	1940 \pm 120	1126 \pm 48
	Second Half	<10	12 \pm 5	<8	13 \pm 8	322 \pm 50	817 \pm 27
C14M	First Half	<2	31 \pm 1	<4	11 \pm 1	144 \pm 13	276 \pm 5
	Second Half	<10	<9	<8	<8	231 \pm 40	866 \pm 29
C14G	First Half	<6	6 \pm 2	<5	17 \pm 2	341 \pm 30	1064 \pm 19
	Second Half	<4	<4	<4	<4	91 \pm 24	979 \pm 41

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 36 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 each quarterly indicator sample, with activity ranging from 628 pCi/kg to 3509 pCi/kg, and is 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 45 pCi/kg and a range of 17 to 111 pCi/kg. Five of twelve control station samples had measurable amounts of cesium-137 with an average of 128 pCi/kg and a range of 23 to 229 pCi/kg.
4. Citrus samples are taken at station C19 and watermelon samples were obtained at station C04. Cesium-137 was quantified at 45 pCi/kg in citrus.

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, 2001

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

FLORIDA POWER CORP. - CR3 - 2001

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	<16	<23	<49	<22	<42	<24	<23	2490 \pm 219
	2	<28	<30	<81	<28	<67	<39	<36	3376 \pm 294
	3	<10	<10	<20	<12	<20	<11	<10	2874 \pm 113
	4	<22	<23	<41	<30	<43	<23	<25	2704 \pm 325
C30	1	<19	<17	<57	<18	<51	<20	<21	2468 \pm 215
	2	<37	<33	<59	<37	<55	<29	<29	2591 \pm 260
	3	<20	<20	<40	<23	<50	<25	<23	2385 \pm 222
	4	<10	<9	<21	<13	<23	<11	<10	2736 \pm 124

Carnivorous Fish

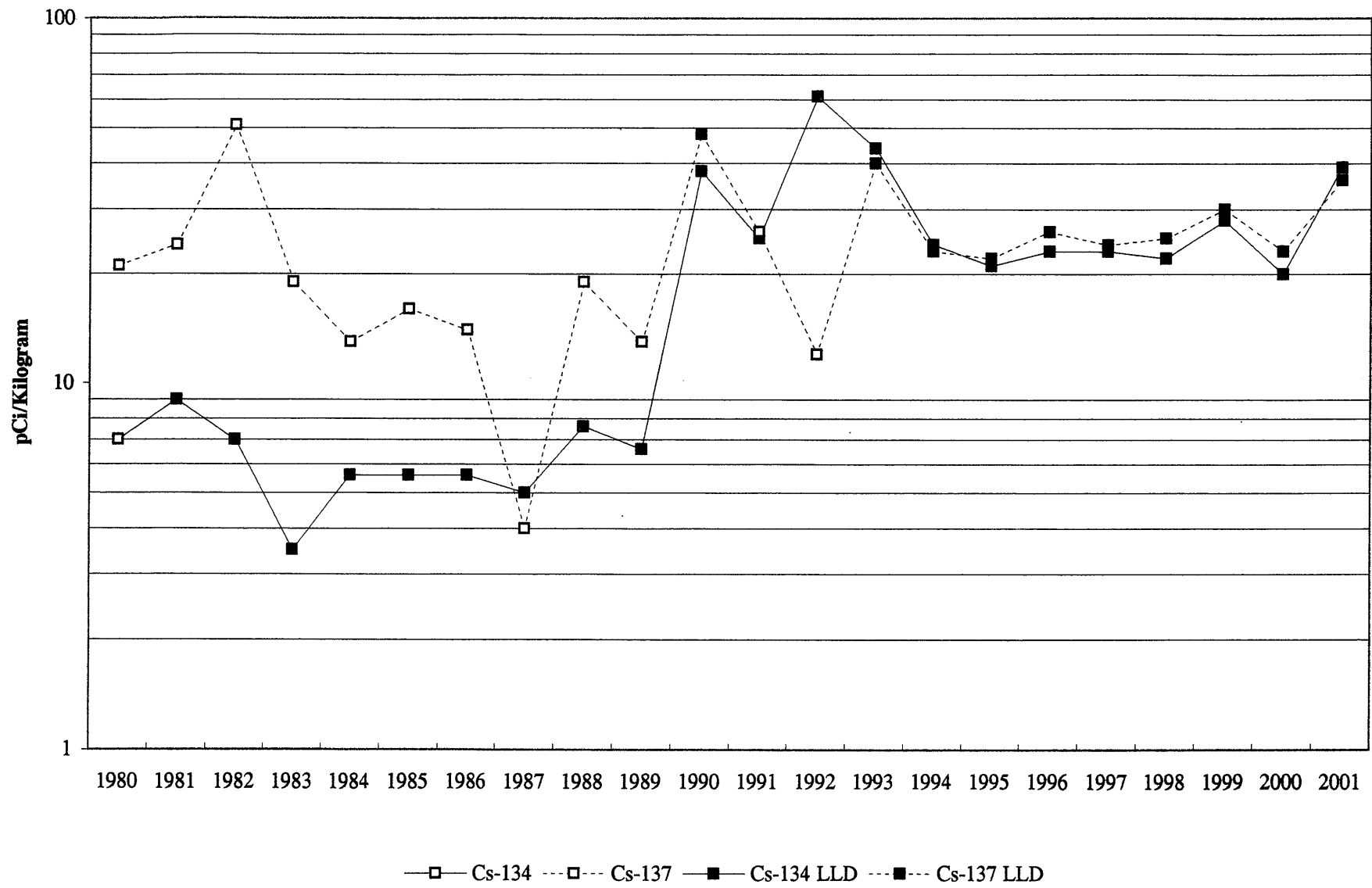


TABLE IV-D.2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2001

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		
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
FLORIDA POWER CORP. - CR3 - 2001
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	<53	<60	<121	<63	<116	<69	<81	1248 \pm 258
	2	<23	<25	<45	<26	<49	<24	<31	1337 \pm 145
	3	<38	<39	<75	<40	<77	<35	<57	1192 \pm 158
	4	<26	<28	<47	<29	<66	<30	<42	1966 \pm 194
C30	1	<33	<29	<60	<38	<69	<30	<25	2065 \pm 253
	2	<37	<39	<73	<54	<92	<49	<41	1229 \pm 289
	3	<24	<25	<59	<25	<65	<30	<32	1040 \pm 166
	4	<21	<25	<53	<25	<56	<27	<29	1509 \pm 178

Ag-110m was quantified in each sample taken at station C29. The concentrations ranged from 628 pCi/Kg to 3509 pCi/Kg. Back up samples taken in February near station C29 ranged from 1631 pCi/Kg to 9235 pCi/Kg.

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

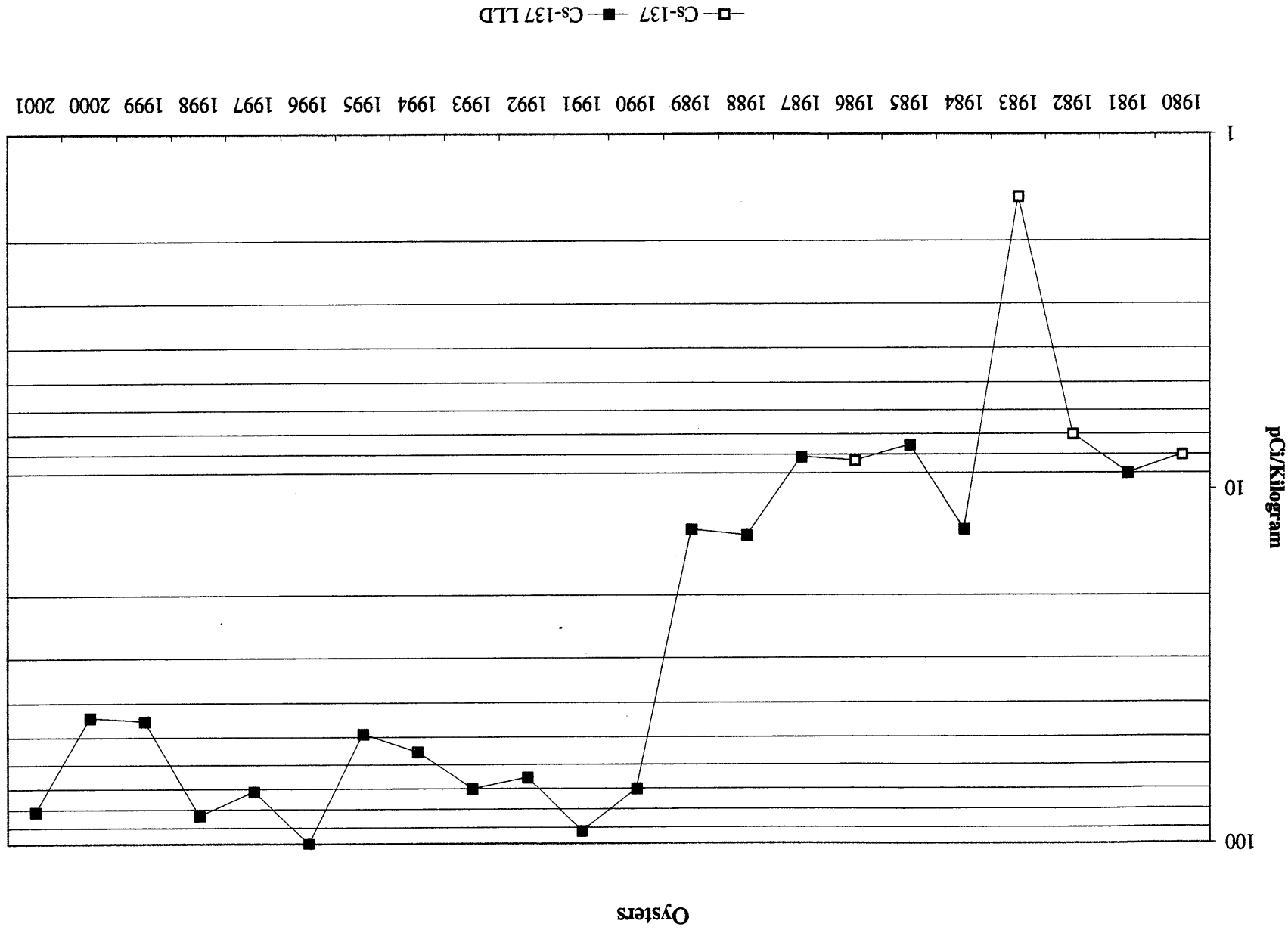


TABLE IV-D.3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2001

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	<u>ALL INDICATOR LOCATIONS</u> MEAN RANGE	<u>LOCATION WITH HIGHEST MEAN</u> 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	45 (6/24) (17-111)	C48A 0.8 @ 30°	48 (5/12) (17-111)	128 (5/12) (23 - 229)	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

FLORIDA POWER CORP. - CR3 - 2001

pCi/kg OF γ EMITTERS IN BROAD LEAF VEGETATION

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C47	JAN	<25	<17	<21	5466 \pm 199
	FEB	<12	<10	23 \pm 7	3035 \pm 137
	MAR	<18	<16	41 \pm 6	3946 \pm 181
	APR	<18	<13	<12	6027 \pm 179
	MAY	<17	<18	<17	4805 \pm 226
	JUN	<26	<19	<16	3454 \pm 202
	JUL	<18	<12	204 \pm 10	1437 \pm 109
	AUG	<13	<16	<14	4150 \pm 166
	SEP	<14	<11	229 \pm 10	1759 \pm 108
	OCT	<17	<13	144 \pm 9	2578 \pm 141
	NOV	<24	<13	<16	4815 \pm 189
	DEC	<11	<13	<12	4669 \pm 170
C48A	JAN	<28	<16	111 \pm 12	3078 \pm 178
	FEB	<12	<10	31 \pm 7	2317 \pm 119
	MAR	<20	<13	<14	4938 \pm 178
	APR	<21	<14	<12	3762 \pm 155
	MAY	<18	<15	<16	2491 \pm 187
	JUN	<26	<17	<19	2607 \pm 173
	JUL	<32	<30	<23	2285 \pm 205
	AUG	<12	<14	27 \pm 9	3212 \pm 153
	SEP	<13	<12	<14	2316 \pm 125
	OCT	<14	<8	17 \pm 3	1812 \pm 99
	NOV	<18	<9	<11	1643 \pm 110
	DEC	<10	<11	53 \pm 6	1587 \pm 101

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

FLORIDA POWER CORP. - CR3 - 2001

pCi/kg OF γ EMITTERS IN BROAD LEAF VEGETATION

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C48B	JAN	<28	<15	<16	6699 \pm 219
	FEB	<12	<10	33 \pm 7	698 \pm 69
	MAR	<22	<20	<16	6591 \pm 235
	APR	<20	<15	<13	7464 \pm 211
	MAY	<18	<17	<23	5744 \pm 248
	JUN	<29	<21	<20	6528 \pm 301
	JUL	<17	<16	<17	1724 \pm 116
	AUG	<12	<13	<14	3919 \pm 159
	SEP	<13	<9	<10	1346 \pm 86
	OCT	<15	<8	<10	2162 \pm 112
	NOV	<14	<11	<13	2830 \pm 158
	DEC	<5	<6	<6	7112 \pm 92

Broad Leaf Vegetation

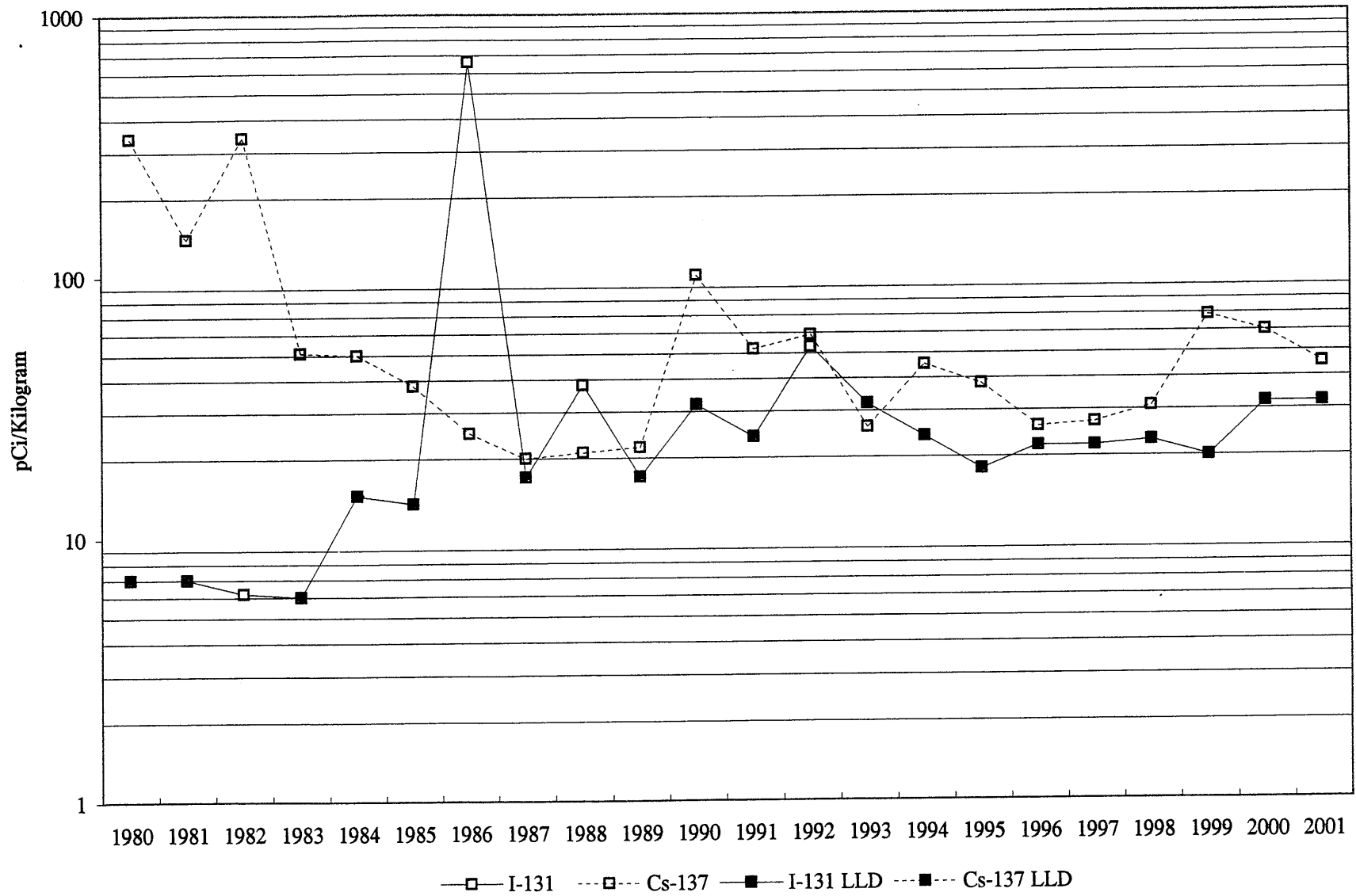


TABLE IV-D.4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 2001

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	45 (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
FLORIDA POWER CORP. - CR3 - 2001
pCi/kg OF γ EMITTERS IN WATERMELON AND CITRUS

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C04 - Watermelon	June	<8	<9	<8	1723 \pm 106
C19 - Citrus	January	<16	<7	45 \pm 7	2727 \pm 105