

# Florida Power

CORPORATION  
Crystal River Unit 3  
Docket No. 50-302

April 30, 1993  
3F0493-18

U.S. Nuclear Regulatory Commission  
Attn: Document Control Room  
Washington, D.C. 20555

Subject: Annual Radiological Environmental Operating Report

Dear Sir:

Florida Power Corporation hereby submits the 1992 Annual Radiological Environmental Operating Report in compliance with Crystal River Unit 3's Technical Specification, Appendix A, Section 6.9.1.5(c). The report contains the data obtained from the radiological environmental surveillance program conducted for the Crystal River site for 1992.

Sincerely,

R. C. Widell  
Director, Nuclear Operations  
Site Support

RCW/REF:ff

Attachment

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

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FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

1992

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

Prepared By

Pat F. Ezell

Radiochemistry & Environmental Specialist

Approved By

W. S. [Signature]

Manager, Site Nuclear Services

Date

4/30/93

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## INTRODUCTION

This report is submitted as required by Technical Specification 6.9.1.5(c) to Crystal River Facility Operating License No. DPR-72. The following information is 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, in the format of Regulatory Guide 4.8 (December 1975), of all radiological environmental samples taken during the report period.

**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 REMP.
- A map of all sampling locations keyed to a table giving distances and directions from the reactor.
- The results of land-use censuses.
- Results of Interlaboratory Comparison Program.



## I. SUMMARY DESCRIPTION OF RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The analytical results of the Crystal River Unit 3 (CR-3) operational Radiological Environmental Monitoring Program (REMP) for 1992 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 State of Florida Department of Health and Rehabilitative Services (FDHRS), Office of Radiation Control. The State also performs the required analyses, participates in the Environmental Protection Agency's (EPA's) Interlaboratory Comparison Program, and performs the annual land-use census.

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 1992 REMP have been compared to previous years' results. This comparison, in part illustrated by the trend graphs<sup>1</sup> of Section IV, shows no evidence of long-term radionuclide buildup in any of the sample media. Additionally, these results verify the effectiveness of in-plant measures for controlling radioactive releases. When combined with dose calculation results<sup>2</sup> (based upon actual release data and a hypothetical individual residing at the Site Boundary), REMP data indicates that the environmental impact of CR-3's operation is not significant.

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<sup>1</sup>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.

<sup>2</sup>For 1992 releases, the whole body dose commitment to the maximum individual was calculated to be < 1 mrem.

TABLE I-1  
FLORIDA POWER CORP. - CR3 - 1992  
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       |

TABLE I-1 (CONT'D)  
FLORIDA POWER CORP. - CR3 - 1992  
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       |
|                    |             |           |          |
| WATER              |             |           |          |
|                    | 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         | E         | 2.0      |
|                    | C30-Control | WSW       | 3.6      |
|                    |             |           |          |
| 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 - 1992  
SAMPLING AND ANALYSIS PROGRAM

| SAMPLE MEDIA    | # OF STATIONS | FREQUENCY | ANALYSIS  | LLD <sup>(1)</sup>      |
|-----------------|---------------|-----------|-----------|-------------------------|
| TLD             | 30            | Quarterly | γ Dose    | ---                     |
| Air Iodine      | 6             | Weekly    | I-131     | 0.07 pCi/m <sup>3</sup> |
| Air Particulate | 6             | Weekly    | Gross B   | 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                      |

(1) The maximum "a priori" LLD

TABLE I-2 (Cont'd)  
FLORIDA POWER CORP. - CR3 - 1992  
SAMPLING AND ANALYSIS PROGRAM

| SAMPLE MEDIA                    | # OF STATIONS | FREQUENCY  | ANALYSIS        | LLD        |
|---------------------------------|---------------|------------|-----------------|------------|
| Ground Water                    | 1             | Semiannual | Tritium         | 2000 pCi/L |
|                                 |               | Semiannual | γ Spec :<br>(2) | (2)        |
| Drinking Water                  | 3             | Quarterly  | Tritium         |            |
|                                 |               | Quarterly  | γ Spec :<br>(2) | (2)        |
| Shoreline Sediment              | 4             | Semiannual | γ Spec :        |            |
|                                 |               |            | Cs-134          | 150 pCi/kg |
|                                 |               |            | Cs-137          | 180        |
| Carnivorous Fish<br>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        |

(2) Same as Seawater γ Spec

TABLE I-2 (Cont'd)  
FLORIDA POWER CORP. - CR3 - 1992  
SAMPLING AND ANALYSIS PROGRAM

| SAMPLE MEDIA          | # OF STATIONS | FREQUENCY   | ANALYSIS | LLD       |
|-----------------------|---------------|-------------|----------|-----------|
| Broad Leaf Vegetation | 3             | Monthly (3) | γ Spec : |           |
|                       |               |             | I-131    | 60 pCi/kg |
|                       |               |             | Cs-134   | 60        |
|                       |               |             | Cs-137   | 80        |
| Citrus                | 1             | Annual (4)  | γ Spec : |           |
|                       |               |             | (5)      | (5)       |
| Watermelon            | 1             | Annual (4)  | γ Spec : |           |
|                       |               |             | (5)      | (5)       |

- 
- (3) When available  
(4) During harvest  
(5) Same as broad leaf vegetation



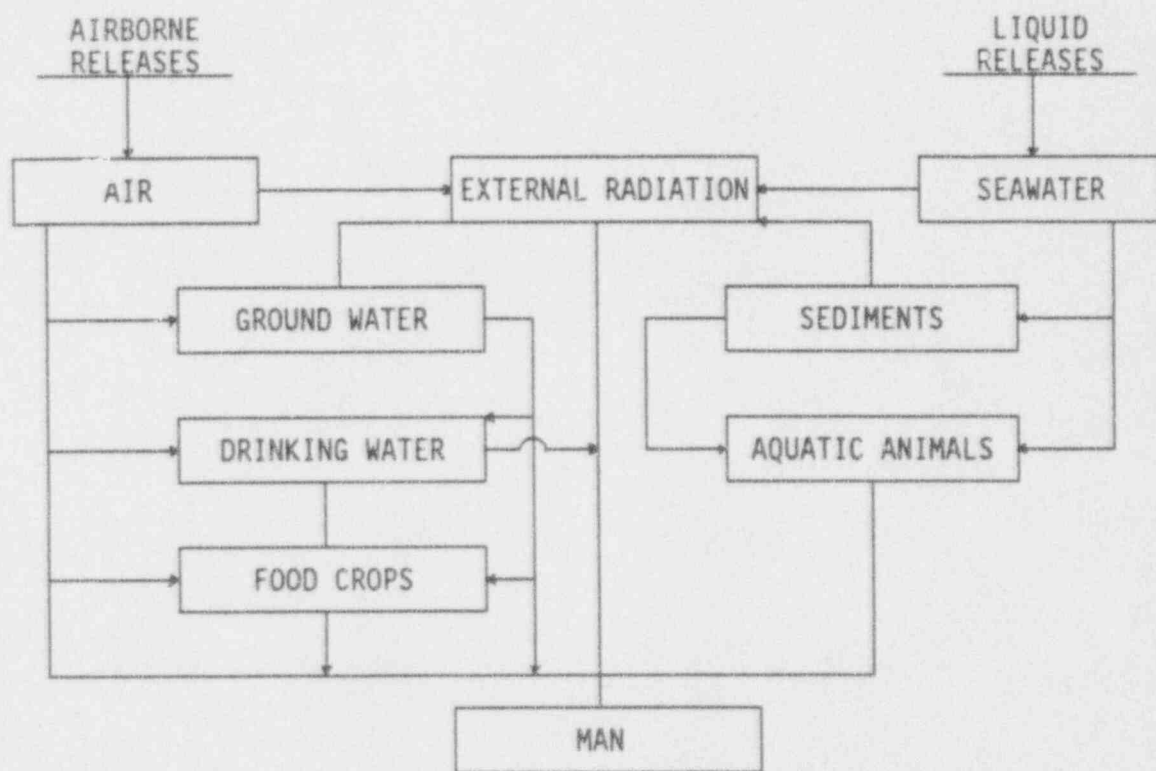


FIGURE I-1: Environmental Media and Exposure Pathways

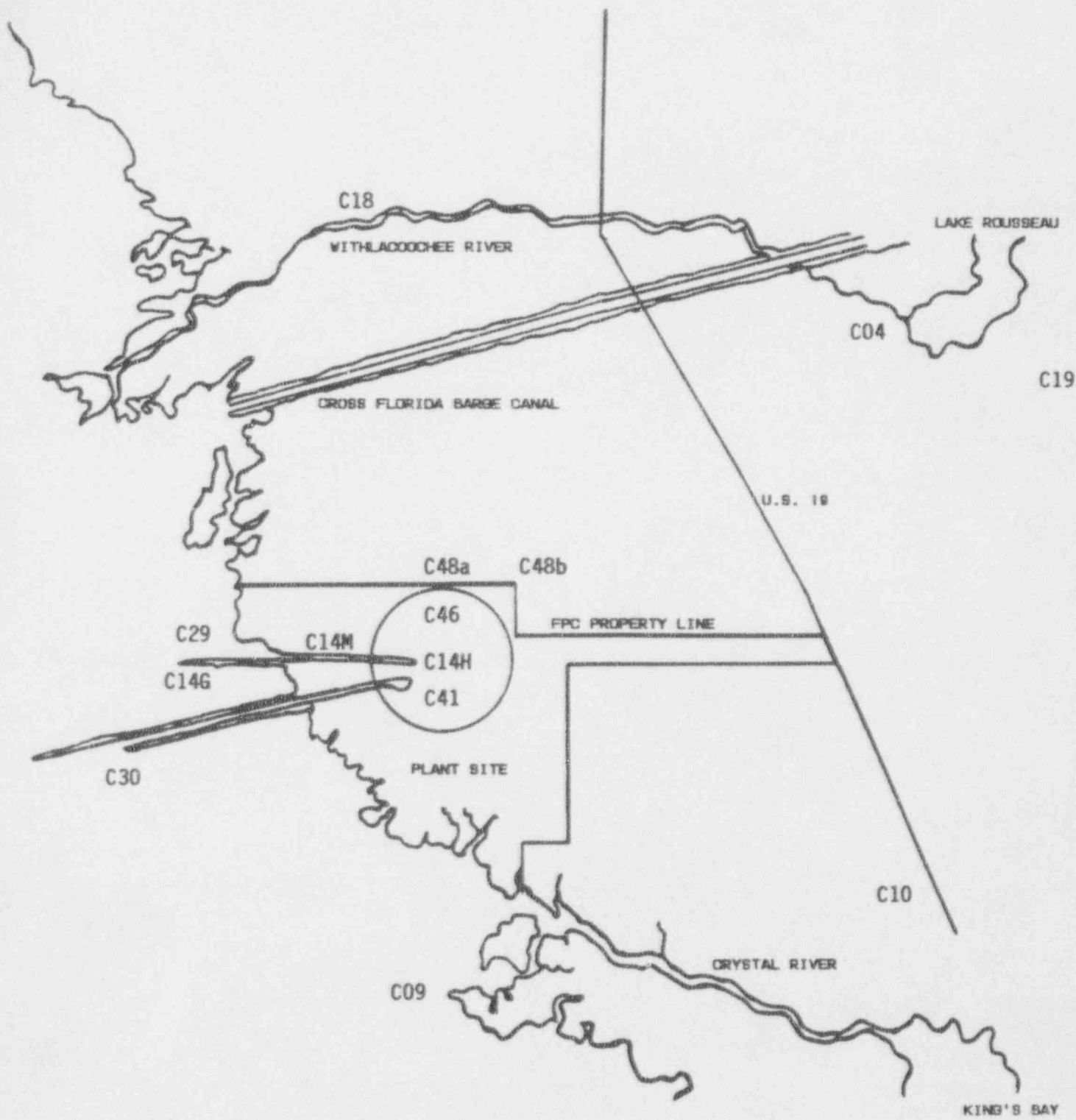


FIGURE I-2: ENVIRONMENTAL MONITORING SAMPLE STATION LOCATIONS

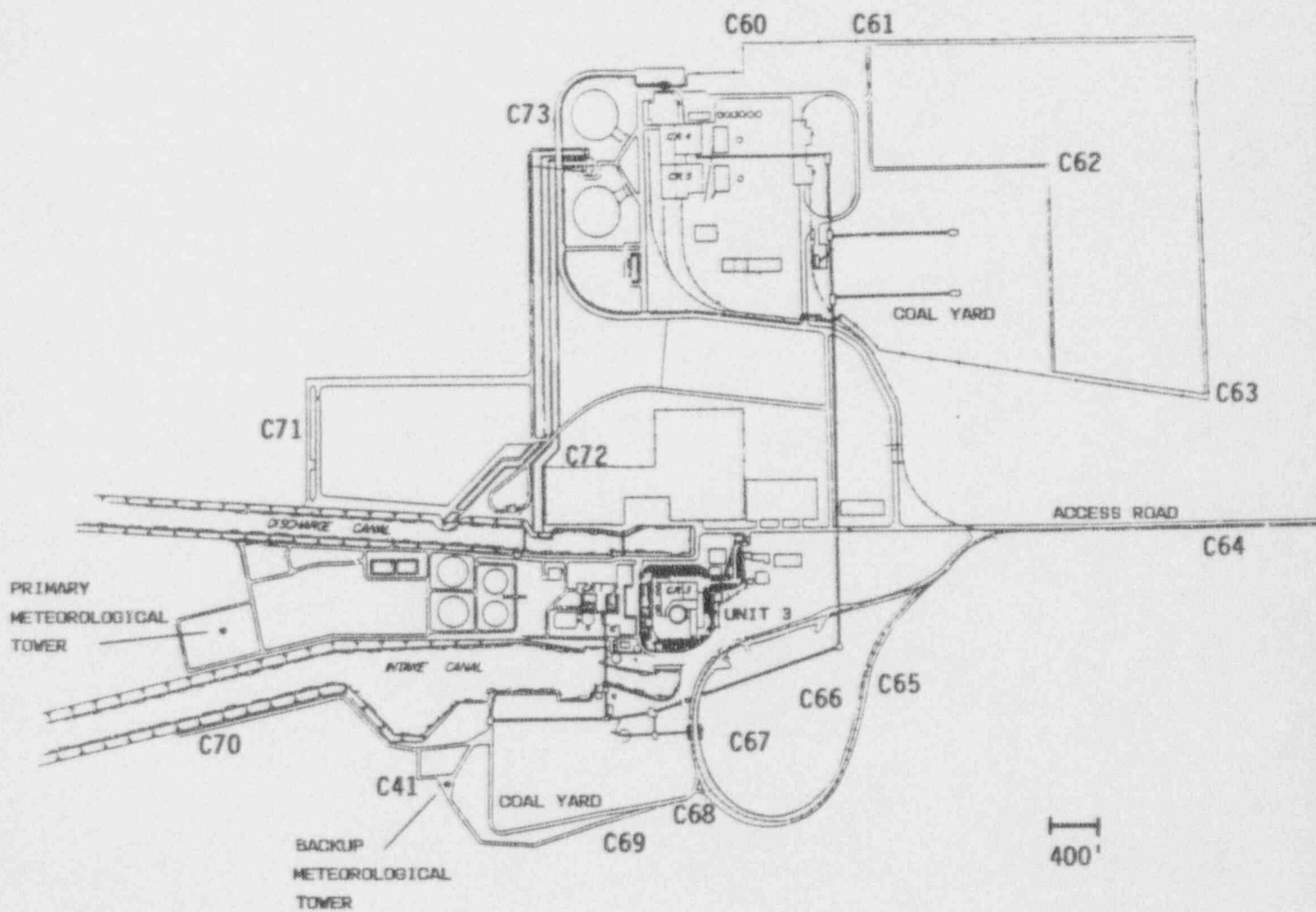


FIGURE I-3: ENVIRONMENTAL MONITORING TLD LOCATIONS (SITE BOUNDARY)

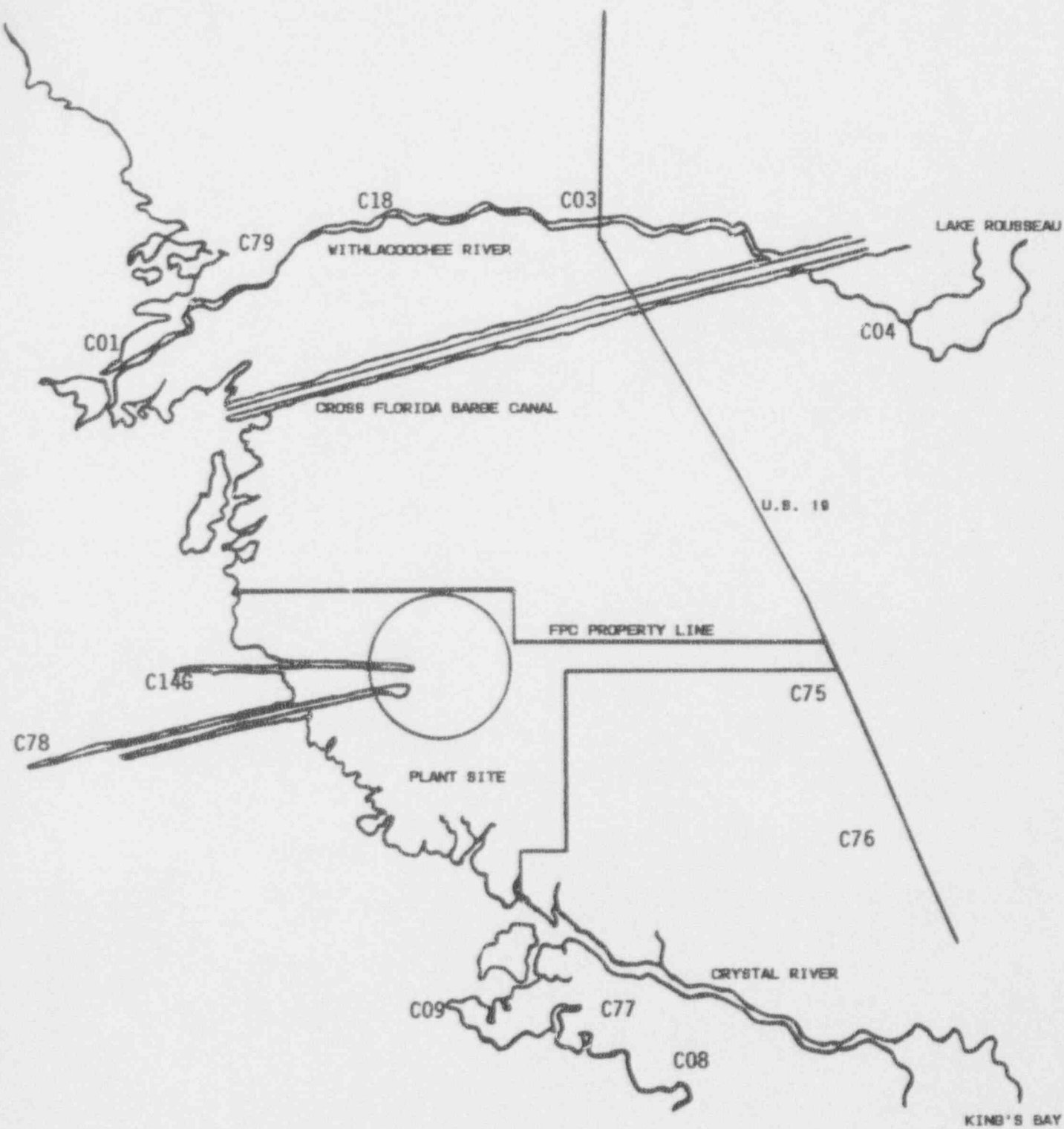


FIGURE I-4: ENVIRONMENTAL MONITORING TLD LOCATIONS (5 MILES)

## II. LAND-USE CENSUS

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

| SECTOR | NEAREST<br>RESIDENCE | NEAREST<br>GARDEN | NEAREST<br>MILK ANIMAL |
|--------|----------------------|-------------------|------------------------|
| N      | 4.4 @ 2°             | 4.7 @ 1°          | **                     |
| NNE    | 3.8 @ 15°            | 4.8 @ 17°         | **                     |
| NE     | 3.8 @ 55°            | 3.8 @ 55°         | **                     |
| ENE    | 3.4 @ 60°            | 4.4 @ 57°         | 4.5 @ 75°              |
| E      | 4.0 @ 92°            | 4.1 @ 93°         | **                     |
| ESE    | 4.2 @ 101°           | 4.2 @ 101°        | **                     |
| SE     | 4.7 @ 133°           | *                 | **                     |
| SSE    | 3.4 @ 150°           | *                 | *                      |
| S      | *                    | *                 | *                      |
| SSW    | *                    | *                 | *                      |
| SW     | *                    | *                 | *                      |
| WSW    | *                    | *                 | *                      |
| W      | *                    | *                 | *                      |
| WNW    | *                    | *                 | *                      |
| NW     | 4.6 @ 319°           | *                 | *                      |
| NNW    | 4.5 @ 338°           | 4.5 @ 339°        | **                     |

\* None

\*\* All sectors around the plant which are not exclusively water or marshland might occasionally have milk-producing animals at the plant boundary. Most of the land adjacent to the plant site is woodland; however, much of the land in the immediate area is pastureland for cattle and a few horses. Stray cattle are often seen in the wooded areas adjacent to the plant site. These cattle are raised for beef or veal. At times there may be fresh females in these herds, but these animals roam freely and are not milked. A few goats have also been located at residences within the survey area. None of these cows or goats are known to be providing milk for human use, and the owners are not willing to make samples of milk available.

FLORIDA DEPT. OF HRS - EPA INTERLABORATORY CROSS-CHECK PROGRAM DATA

January through June, 1992

| Media  | Nuclide | Collection |     |    | EPA Units  | Normal. | Mean of  | N.D.K. | Action |
|--------|---------|------------|-----|----|------------|---------|----------|--------|--------|
|        |         | Mon        | Day | Yr | Known      | Range   | Analyses |        | Level  |
| FILTER | Alpha   | 03         | 27  | 92 | 7 pCi/F    | 0.118   | 9.33     | 0.81   |        |
| FILTER | Beta    | 03         | 27  | 92 | 41 pCi/F   | 0.236   | 41.00    | 0.00   |        |
| FILTER | Cs-137  | 03         | 27  | 92 | 10 pCi/F   | 0.000   | 66.00    | 19.40  | 1      |
| FILTER | Sr-90   | 03         | 27  | 92 | 15 pCi/F   | 0.236   | 12.67    | -0.81  |        |
| MILK   | I-131   | 04         | 24  | 92 | 78 pCi/L   | 0.148   | 79.33    | 0.29   |        |
| MILK   | Cs-137  | 04         | 24  | 92 | 39 pCi/L   | 0.354   | 42.33    | 1.15   |        |
| MILK   | K       | 04         | 24  | 92 | 1710 mg/L  | 0.453   | 1630.67  | -1.60  |        |
| MILK   | Sr-89   | 04         | 24  | 92 | 38 pCi/L   | 0.591   | 17.00    | -7.27  | 2      |
| MILK   | Sr-90   | 04         | 24  | 92 | 29 pCi/L   | 0.827   | 31.33    | 0.81   |        |
| WATER  | Alpha   | 01         | 31  | 92 | 30 pCi/L   | 0.148   | 23.00    | -1.52  |        |
| WATER  | Alpha   | 05         | 15  | 92 | 15 pCi/L   | 0.236   | 18.67    | 1.27   |        |
| WATER  | Beta    | 01         | 31  | 92 | 30 pCi/L   | 0.354   | 35.67    | 1.96   |        |
| WATER  | Beta    | 05         | 15  | 92 | 44 pCi/L   | 0.236   | 52.00    | 2.77   |        |
| WATER  | Co-60   | 02         | 14  | 92 | 40 pCi/L   | 0.473   | 40.67    | 0.23   |        |
| WATER  | Co-60   | 06         | 05  | 92 | 20 pCi/L   | 0.000   | 20.00    | 0.00   |        |
| WATER  | Zn-65   | 02         | 14  | 92 | 148 pCi/L  | 0.197   | 149.00   | 0.12   |        |
| WATER  | Zn-65   | 06         | 05  | 92 | 99 pCi/L   | 0.295   | 103.00   | 0.69   |        |
| WATER  | Ru-106  | 02         | 14  | 92 | 203 pCi/L  | 0.059   | 194.67   | -0.72  |        |
| WATER  | Ru-106  | 06         | 05  | 92 | 141 pCi/L  | 0.253   | 138.00   | -0.37  |        |
| WATER  | Ba-133  | 02         | 14  | 92 | 76 pCi/L   | 0.148   | 73.00    | -0.65  |        |
| WATER  | Ba-133  | 06         | 05  | 92 | 98 pCi/L   | 0.177   | 94.67    | -0.58  |        |
| WATER  | Cs-134  | 02         | 14  | 92 | 31 pCi/L   | 0.236   | 29.00    | -0.69  |        |
| WATER  | Cs-134  | 06         | 05  | 92 | 15 pCi/L   | 0.118   | 14.33    | -0.23  |        |
| WATER  | Cs-137  | 02         | 14  | 92 | 49 pCi/L   | 0.236   | 51.33    | 0.81   |        |
| WATER  | Cs-137  | 06         | 05  | 92 | 15 pCi/L   | 0.118   | 15.33    | 0.12   |        |
| WATER  | H-3     | 02         | 21  | 92 | 7904 pCi/L | 0.202   | 8043.33  | 0.31   |        |
| WATER  | H-3     | 06         | 19  | 92 | 2125 pCi/L | 0.160   | 2235.67  | 0.55   |        |
| WATER  | I-131   | 02         | 07  | 92 | 59 pCi/L   | 0.098   | 60.33    | 0.38   |        |
| WATER  | Sr-89   | 01         | 17  | 92 | 51 pCi/L   | 5.396   | 27.00    | -8.31  | 3      |
| WATER  | Sr-89   | 05         | 08  | 92 | 29 pCi/L   | 0.236   | 27.00    | -0.69  |        |
| WATER  | Sr-90   | 01         | 17  | 92 | 20 pCi/L   | 0.945   | 24.33    | 1.50   |        |
| WATER  | Sr-90   | 05         | 08  | 92 | 8 pCi/L    | 0.118   | 7.67     | -0.12  |        |

ACTION LEVEL:

- (1) Cause: An incorrect efficiency file was used to calculate the results.  
Corrective Action: Check the final printout from the gamma spectrometer more carefully.
- (2) Cause: An incorrect date for beginning of the yttrium ingrowth was used in the calculations.  
Corrective Action: Point out to the new chemist the significance of the ingrowth date and stress its importance in the calculation of the data.
- (3) Cause: A short term glitch in the proportional counter produced very erroneous data.  
Corrective Action: Check the proportional counter printout for obvious glitches.



FLORIDA DEPT. OF HRS - EPA INTERLABORATORY CROSS-CHECK PROGRAM DATA

July through December, 1992

| Media  | Nuclide | Collection |     |    | EPA   | Units | Normal. | Mean of  | N.D.K. | Action |
|--------|---------|------------|-----|----|-------|-------|---------|----------|--------|--------|
|        |         | Mon        | Day | Yr | Known |       | Range   | Analyses |        | Level  |
| FILTER | Alpha   | 08         | 28  | 92 | 30    | pCi/F | 0.074   | 33.33    | 0.72   |        |
| FILTER | Beta    | 08         | 28  | 92 | 69    | pCi/F | 0.059   | 72.67    | 0.64   |        |
| FILTER | Cs-137  | 08         | 28  | 92 | 18    | pCi/F | 0.000   | 21.00    | 1.04   |        |
| FILTER | Sr-90   | 08         | 28  | 92 | 25    | pCi/F | 0.000   | 22.00    | -1.04  |        |
| MILK   | I-131   | 09         | 25  | 92 | 100   | pCi/L | 0.059   | 97.33    | -0.46  |        |
| MILK   | Cs-137  | 09         | 25  | 92 | 15    | pCi/L | 0.236   | 16.00    | 0.35   |        |
| MILK   | K       | 09         | 25  | 92 | 1750  | mg/L  | 0.262   | 1660.00  | -1.77  |        |
| MILK   | Sr-89   | 09         | 25  | 92 | 15    | pCi/L | 0.118   | 10.67    | -1.50  |        |
| MILK   | Sr-90   | 09         | 25  | 92 | 15    | pCi/L | 0.118   | 11.33    | -1.27  |        |
| WATER  | Alpha   | 09         | 18  | 92 | 45    | pCi/L | 0.107   | 52.00    | 1.10   |        |
| WATER  | Beta    | 09         | 18  | 92 | 50    | pCi/L | 0.709   | 47.00    | -1.04  |        |
| WATER  | Co-60   | 10         | 09  | 92 | 10    | pCi/L | 0.118   | 10.33    | 0.12   |        |
| WATER  | Zn-65   | 10         | 09  | 92 | 148   | pCi/L | 0.158   | 152.00   | 0.46   |        |
| WATER  | Ru-106  | 10         | 09  | 92 | 175   | pCi/L | 0.492   | 167.33   | -0.74  |        |
| WATER  | Ba-133  | 10         | 09  | 92 | 74    | pCi/L | 0.253   | 71.00    | -0.74  |        |
| WATER  | Cs-134  | 10         | 09  | 92 | 8     | pCi/L | 0.118   | 6.67     | -0.46  |        |
| WATER  | Cs-137  | 10         | 09  | 92 | 8     | pCi/L | 0.118   | 8.33     | 0.12   |        |
| WATER  | H-3     | 10         | 23  | 92 | 5962  | pCi/L | 0.078   | 5584.67  | -1.10  |        |
| WATER  | I-131   | 08         | 07  | 92 | 45    | pCi/L | 0.098   | 43.67    | -0.38  |        |
| WATER  | Sr-89   | 09         | 11  | 92 | 20    | pCi/L | 0.236   | 14.33    | -1.96  |        |
| WATER  | Sr-90   | 09         | 11  | 92 | 15    | pCi/L | 0.118   | 10.67    | -1.50  |        |

NOTES:

Normal.: Normalized range. As defined in "Environmental Range Radioactivity Laboratory Intercomparison Studies Program Fiscal Year 1981 - 1982", Environmental Monitoring Systems Laboratory, U. S. Environmental Protection Agency, P. O. Box 93478, Las Vegas, Nevada, 89193-3478. EPA-600/4-81-004, February, 1981.

N.D.K.: Normalized deviation of the mean from the known value, as defined in EPA-600/4-81-004.

NDP: No data provided. No data was provided to EPA for inclusion in their report.

NA: Not available. Report containing this data has not yet been received from EPA, Las Vegas.

#### IV-A. AIRBORNE PATHWAY

Air samples are taken at five locations in the vicinity of the plant. The control location is 80 miles ESE of the plant.

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

Of 312 particulate samples analyzed for gross beta activity, 310 had measurable activity. The average indicator concentration was 15 pCi/1,000 m<sup>3</sup> with a range of 4 to 193 pCi/1,000 m<sup>3</sup>. The average indicator concentration for each year since 1989 has been 15 pCi/1,000 m<sup>3</sup>.

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

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

Second Quarter composite data are summarized in Table IV-A.4. Measurable quantities of Cesium were not identified. The highest Cesium LLD was 1.5 pCi/1,000 m<sup>3</sup>.

TABLE IV-A.1

## RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 5-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br><br>(UNITS)   | ANALYSIS AND  | LOWER LIMIT<br>OF DETECTION<br>(LLD) <sup>(1)</sup> | ALL INDICATOR LOCATIONS                  | LOCATION WITH HIGHEST MEAN |                                   | CONTROL LOCATION                       | NUMBER OF                |
|--|---|---|--|----------------------------|-----------------------------------|--|--------------------------|
|  | TOTAL NUMBER  |   | MEAN                                     | NAME                       | MEAN                              | MEAN                                   | NONROUTINE               |
|  | OF ANALYSES<br>PERFORMED                                  |   | RANGE                                    | DISTANCE & BEARING         | RANGE                             | RANGE                                  | REPORTED<br>MEASUREMENTS |
| AIRBORNE<br>IODINE<br>(pCi/m <sup>3</sup> )  | $\gamma$ Spec 312<br>1-131                                | 0.024   | <LLD                                     | -                          | -                                 | <LLD                                   | 0                        |
| AIRBORNE<br>PARTICULATES<br>(pCi/1000m <sup>3</sup> for<br>Gross $\beta$ ,<br>pCi/1000m <sup>3</sup> For<br>$\gamma$ Spec) | Gross $\beta$ 312<br>$\gamma$ Spec 24<br>Cs-134<br>Cs-137 | 2.5<br><br>6.9<br>6.6                               | 15(258/260)<br>(4 - 193)<br><LLD<br><LLD | C40<br>3.5 @ 90<br>-<br>-  | 14 (51/52)<br>(5 - 193)<br>-<br>- | 12 (52/52)<br>(6 - 67)<br><LLD<br><LLD | 0<br><br>0<br>0          |

(1) The "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 - 1992  
pCi/m<sup>3</sup> IODINE - 131 IN AIR

| COLLECTION DATE | C07  | C18  | C40  | C41  | C46  | C47  |
|-----------------|------|------|------|------|------|------|
| 01-06           | <.02 | <.03 | <.02 | <.02 | <.03 | <.02 |
| 01-14           | <.03 | <.02 | <.03 | <.02 | <.03 | <.03 |
| 01-21           | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 01-27           | <.06 | <.06 | <.06 | <.06 | <.06 | <.05 |
| 02-03           | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 02-10           | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 02-17           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 02-24           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 03-02           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 03-10           | <.01 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 03-16           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 03-23           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 03-30           | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 04-06           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 04-13           | <.02 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 04-20           | <.02 | <.02 | <.02 | <.02 | <.02 | <.01 |
| 04-27           | <.02 | <.04 | <.04 | <.04 | <.04 | <.03 |

TABLE IV-A.2 (Cont'd)  
 FLORIDA POWER CORP. - CR3 - 1992  
 pCi/m<sup>3</sup> IODINE - 131 IN AIR

| COLLECTION DATE | C07  | C18  | C40  | C41  | C46  | C47  |
|-----------------|------|------|------|------|------|------|
| 05-04           | <.04 | <.04 | <.03 | <.04 | <.04 | <.04 |
| 05-11           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 05-19           | <.02 | <.01 | <.01 | <.02 | <.01 | <.01 |
| 05-27           | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 |
| 06-02           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 06-09           | <.02 | <.02 | <.02 | <.02 | <.02 | <.03 |
| 06-16           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 06-22           | <.01 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 06-29           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 07-06           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 07-13           | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 |
| 07-20           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 07-27           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 08-03           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 08-11           | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 08-17           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 08-24           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 08-31           | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |

TABLE IV-A.2 (Cont'd)  
 FLORIDA POWER CORP. - CR3 - 1992  
 pCi/m<sup>3</sup> IODINE - 131 IN AIR

| COLLECTION DATE | C07  | C18  | C40  | C41  | C46  | C47  |
|-----------------|------|------|------|------|------|------|
| 09-08           | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 09-14           | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 09-21           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 09-28           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 10-05           | <.01 | <.02 | <.02 | <.02 | <.01 | <.02 |
| 10-12           | <.02 | <.02 | <.02 | <.02 | <.02 | <.05 |
| 10-19           | <.05 | <.05 | <.05 | <.05 | <.05 | <.04 |
| 10-26           | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 |
| 11-03           | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| 11-09           | <.02 | <.02 | <.02 | <.02 | <.03 | <.02 |
| 11-16           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 11-23           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 12-01           | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 |
| 12-07           | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 |
| 12-14           | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 |
| 12-21           | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| 12-29           | <.02 | <.02 | <.01 | <.02 | <.02 | <.02 |



TABLE IV-A.3

FLORIDA POWER CORP. - CR3 - 1992

pCi/1000m3 GROSS B IN AIR

| COLLECTION DATE | C07 | C18 | C40 | C41 | C46 | C47 |
|-----------------|-----|-----|-----|-----|-----|-----|
| 01-06           | 13  | 8   | 10  | 12  | 11  | 14  |
| 01-14           | 19  | 9   | 9   | 19  | 20  | 18  |
| 01-21           | 14  | 12  | 15  | 14  | 15  | 17  |
| 01-27           | 12  | 10  | 17  | 14  | 13  | 14  |
| 02-03           | 12  | 11  | 12  | 13  | 10  | 6   |
| 02-10           | 15  | 11  | 11  | 14  | 14  | 10  |
| 02-17           | 10  | 12  | 17  | 11  | 12  | 12  |
| 02-24           | 10  | 8   | 13  | 11  | 8   | 11  |
| 03-02           | 12  | 13  | 9   | 10  | 9   | 13  |
| 03-10           | 11  | 9   | 14  | 15  | 11  | 10  |
| 03-16           | 16  | 15  | 14  | 12  | 17  | 12  |
| 03-23           | 14  | 13  | 16  | 15  | 18  | 14  |
| 03-30           | 9   | 16  | 17  | 14  | 8   | 10  |
| 04-06           | 16  | 16  | 11  | 19  | 21  | 12  |
| 04-13           | 10  | 15  | 14  | 13  | 13  | 12  |
| 04-20           | 9   | 12  | 8   | 13  | 12  | 13  |
| 04-27           | 8   | 13  | 12  | 11  | 15  | 12  |

TABLE IV-A.3 (Cont'd)  
 FLORIDA POWER CORP. - CR3 - 1992  
 pCi/1000m<sup>3</sup> GROSS B IN AIR

| COLLECTION DATE | C07 | C18 | C40 | C41 | C46 | C47 |
|-----------------|-----|-----|-----|-----|-----|-----|
| 05-04           | 13  | 15  | 10  | 13  | 17  | 15  |
| 05-11           | 10  | 14  | 8   | 15  | 19  | 13  |
| 05-19           | 14  | 16  | 16  | 12  | 12  | 11  |
| 05-27           | 12  | 17  | 24  | 14  | 15  | 11  |
| 06-02           | 22  | 22  | 23  | 18  | 18  | 17  |
| 06-09           | 8   | 11  | 7   | 11  | 10  | 9   |
| 06-16           | 6   | 8   | 11  | 8   | 13  | 7   |
| 06-22           | 12  | 12  | 20  | 12  | 14  | 16  |
| 06-29           | 8   | 11  | 16  | 8   | 8   | 11  |
| 07-06           | 14  | 21  | 20  | 19  | 16  | 24  |
| 07-13           | 17  | 29  | 24  | 27  | 23  | 23  |
| 07-20           | 5   | 10  | 11  | 9   | 8   | 7   |
| 07-27           | 7   | 12  | 12  | 14  | 12  | 14  |
| 08-03           | 7   | 16  | 16  | 16  | 15  | 18  |
| 08-11           | 6   | 8   | 9   | 10  | 12  | 5   |
| 08-17           | <5  | 6   | 5   | 4   | <4  | 8   |
| 08-24           | 6   | 10  | 9   | 6   | 9   | 6   |
| 08-31           | 10  | 16  | 14  | 10  | 12  | 9   |

TABLE IV-A.3 (Cont'd)  
 FLORIDA POWER CORP. - CR3 - 1992  
 pCi/1000m<sup>3</sup> GROSS B IN AIR

| COLLECTION DATE | C07 | C18 | C40 | C41 | C46 | C47 |
|-----------------|-----|-----|-----|-----|-----|-----|
| 09-08           | 7   | 10  | 10  | 8   | 13  | 13  |
| 09-14           | 13  | 13  | 17  | 9   | 14  | 11  |
| 09-21           | 10  | 9   | 18  | 8   | 7   | 6   |
| 09-28           | 10  | 10  | 7   | 4   | 9   | 7   |
| 10-05           | 10  | 12  | 17  | 10  | 11  | 11  |
| 10-12           | 5   | 9   | 13  | 7   | 13  | 12  |
| 10-19           | 19  | 22  | 25  | 27  | 24  | 23  |
| 10-26           | 49  | 94  | 186 | 39  | 44  | 51  |
| 11-03           | 28  | 43  | 63  | 27  | 31  | 40  |
| 11-09           | 11  | 10  | 9   | 11  | 11  | 8   |
| 11-16           | 29  | 22  | 40  | 25  | 21  | 9   |
| 11-23           | 15  | 16  | 94  | 13  | 19  | 21  |
| 12-01           | 28  | 27  | 41  | 15  | 20  | 22  |
| 12-07           | 54  | 67  | 193 | 36  | 45  | 65  |
| 12-14           | 11  | 22  | 22  | 16  | 21  | 20  |
| 12-21           | 50  | 68  | 167 | 48  | 64  | 67  |
| 12-29           | 17  | 22  | 24  | 19  | 24  | 17  |

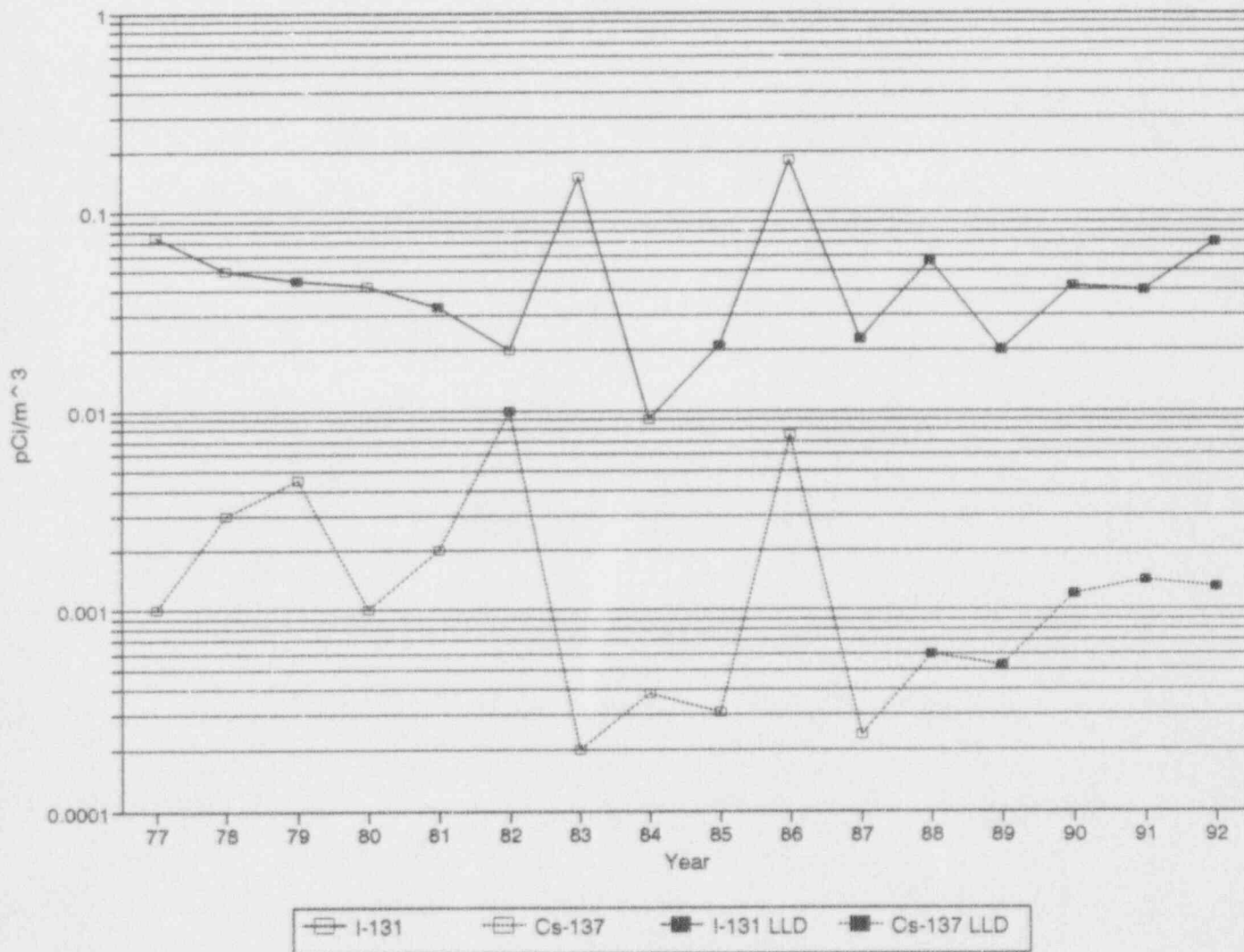
TABLE IV-A.4

FLORIDA POWER CORP. - CR3 - 1992

pCi/1000m<sup>3</sup>  $\gamma$  EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATES

| STATION | NUCLIDE | FIRST QUARTER | SECOND QUARTER | THIRD QUARTER | FOURTH QUARTER |
|---------|---------|---------------|----------------|---------------|----------------|
| C07     | Be-7    | 94            | 81             | 79            | 96             |
|         | K-40    | 12            | <21            | <19           | <18            |
|         | Cs-134  | <1.5          | <0.8           | <1.2          | <0.9           |
|         | Cs-137  | <0.7          | <0.9           | <1.2          | <0.9           |
| C18     | Be-7    | 86            | 85             | 107           | 93             |
|         | K-40    | 11            | <16            | <18           | <21            |
|         | Cs-134  | <0.9          | <0.8           | <1.7          | <0.9           |
|         | Cs-137  | <0.8          | <1.0           | <1.3          | <0.9           |
| C40     | Be-7    | 84            | 83             | 52            | 100            |
|         | K-40    | <14           | <21            | <16           | <21            |
|         | Cs-134  | <1.4          | <1.0           | <1.1          | <0.9           |
|         | Cs-137  | <1.0          | <1.1           | <1.1          | <0.8           |
| C41     | Be-7    | 97            | 85             | 80            | 92             |
|         | K-40    | <18           | <19            | <12           | <18            |
|         | Cs-134  | <0.9          | <0.8           | <1.2          | <1.0           |
|         | Cs-137  | <1.0          | <0.6           | <1.0          | <0.9           |
| C46     | Be-7    | 124           | 95             | 104           | 95             |
|         | K-40    | <20           | <24            | <20           | <19            |
|         | Cs-134  | <1.2          | <1.1           | <1.2          | <1.1           |
|         | Cs-137  | <0.8          | <1.0           | <0.8          | <0.8           |
| C47     | Be-7    | 102           | 112            | 90            | 103            |
|         | K-40    | <20           | <22            | <17           | <18            |
|         | Cs-134  | <1.2          | <1.0           | <1.1          | <1.0           |
|         | Cs-137  | <0.8          | <1.0           | <0.6          | <1.1           |

# Air Samples



#### IV-B. DIRECT RADIATION

Direct radiation measurements (using TLDs) were taken at sixteen locations within one mile of the plant, at thirteen locations ranging from 2.8 to 6.3 miles from the plant, and at one control location 80 miles from the site. The highest on-site dose was 96 mrem/yr at station C62 (NNE at 5300 feet). The highest off-site dose was 54 mrem/yr at station C14G (west at 2.8 miles). The control station (C47) dose was 47 mrem/yr. The average for all stations was 56 mrem/yr.



TABLE IV-B

## RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 5-302

CITRUS COUNTY, FLORIDA

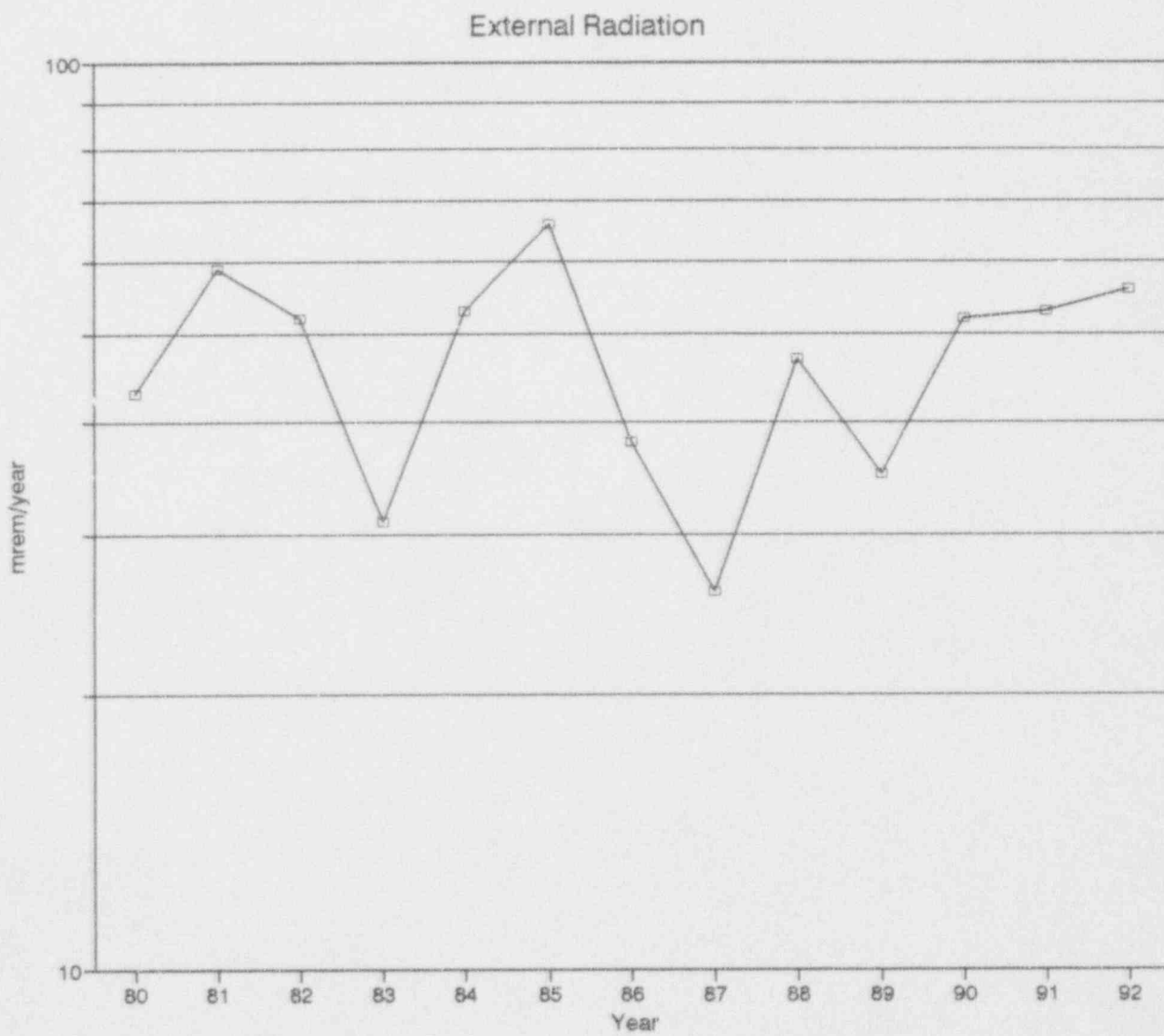
JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br>(UNITS) | ANALYSIS AND | LOWER LIMIT<br>OF DETECTION<br>(LLD) | ALL INDICATOR LOCATIONS   |                            | LOCATION WITH HIGHEST MEAN |                       | CONTROL LOCATION                       | NUMBER OF |
|--|--------------|--------------------------------------|---------------------------|----------------------------|----------------------------|-----------------------|--|-----------|
|  | TOTAL NUMBER |                                      | MEAN<br>RANGE             | NAME<br>DISTANCE & BEARING | MEAN<br>RANGE              | MEAN<br>RANGE         | NONROUTINE<br>REPORTED<br>MEASUREMENTS |           |
|  | OF ANALYSES  |                                      |                           |                            |                            |                       |  |           |
|  | PERFORMED    |                                      |                           |                            |                            |                       |  |           |
| DIRECT<br>RADIATION<br>(mrem/yr)           | 7 DOSE 120   | 15                                   | 56 (116/116)<br>(41 - 96) |                            | C62<br>0.9 @ 35'           | 85 (4/4)<br>(74 - 97) | 47 (4/4)<br>(46 - 49)                  | 0         |

TABLE IV-B.1  
FLORIDA POWER CORP. - CR-3 - 1992

mrem/yr  $\gamma$  Dose

| TLD STATION   | Quarter: | 1  | 2  | 3  | 4  |
|---------------|----------|----|----|----|----|
| C01           |          | 46 | 49 | 44 | 48 |
| C03           |          | 49 | 48 | 48 | 48 |
| C04           |          | 47 | 46 | 46 | 46 |
| C08           |          | 46 | 46 | 44 | 48 |
| C09           |          | 46 | 50 | 46 | 48 |
| C14G          |          | 53 | 55 | 52 | 55 |
| C18           |          | 53 | 53 | 52 | 53 |
| C27           |          | 64 | 66 | 64 | 62 |
| C41           |          | 60 | 61 | 59 | 66 |
| C47 (CONTROL) |          | 46 | 49 | 47 | 47 |
| C60           |          | 54 | 53 | 53 | 52 |
| C61           |          | 58 | 57 | 56 | 54 |
| C62           |          | 89 | 96 | 90 | 94 |
| C63           |          | 54 | 58 | 54 | 57 |
| C64           |          | 50 | 54 | 53 | 56 |
| C65           |          | 58 | 60 | 58 | 59 |
| C66           |          | 57 | 56 | 61 | 56 |
| C67           |          | 59 | 57 | 59 | 58 |
| C68           |          | 58 | 57 | 58 | 58 |
| C69           |          | 58 | 57 | 58 | 60 |
| C70           |          | 62 | 62 | 62 | 58 |
| C71           |          | 75 | 79 | 74 | 84 |
| C72           |          | 53 | 55 | 55 | 55 |
| C73           |          | 56 | 56 | 52 | 56 |
| C74           |          | 43 | 46 | 45 | 46 |
| C75           |          | 50 | 52 | 51 | 53 |
| C76           |          | 47 | 47 | 46 | 49 |
| C77           |          | 41 | 46 | 42 | 45 |
| C78           |          | 46 | 43 | 47 | 44 |
| C79           |          | 52 | 48 | 51 | 48 |



#### IV-C. WATERBORNE PATHWAY

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

1. Monthly seawater grab samples are taken at two locations in the discharge canal and at one control location near the mouth of the intake canal. Of twenty-four indicator samples, fifteen had a measurable amount of Tritium at an average level of 1323 pCi/L. Four samples taken at the control location, C13, indicated measurable amounts of Tritium at an average level of 265 pCi/L.

Gamma spectral analysis was performed on thirty-six samples. One sample, taken in January, had measurable amounts of several gamma emitters - cobalt-58 at 89 pCi/L; cesium-134 at 38 pCi/L; and cesium-137 at 52 pCi/L.

2. Semiannual groundwater samples are taken at one location, station C40. Gamma spectral and Tritium analyses are performed on both samples. All results were less than the LLD. 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 groundwater is 2000 pCi/L. Analysis of groundwater in the vicinity of CR-3 is done at sensitivity of approximately 200 pCi/L.
3. Quarterly drinking water samples are drawn from three locations: the Crystal River Public Water Plant (C07), the Indian Waters Public Water Supply (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 for Tritium or the required gamma emitters.
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 eight samples analyzed, six had measurable amounts of cobalt and four had measurable amounts of cesium. Sample concentrations were in direct proportion to the their distance from the liquid effluent discharge point. Highest concentrations were found in samples taken just downstream (about 100 meters) of the discharge point during the month of February. These sample results correlate to elevated effluent discharges during the first quarter of 1992.

TABLE IV-C.1

## RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 5-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br>(UNITS) | ANALYSIS AND<br>TOTAL NUMBER<br>OF ANALYSES<br>PERFORMED | LOWER LIMIT<br>OF DETECTION<br>(LLD) <sup>(1)</sup> | ALL INDICATOR LOCATIONS      | LOCATION WITH HIGHEST MEAN |                             | CONTROL LOCATION<br>MEAN<br>RANGE | NUMBER OF<br>NONROUTINE<br>REPORTED<br>MEASUREMENTS |
|--|--|---|------------------------------|----------------------------|-----------------------------|-----------------------------------|---|
|  |  |   | MEAN<br>RANGE                | NAME<br>DISTANCE & BEARING | MEAN<br>RANGE               |                                   |   |
| SEA WATER<br>(pCi/L)                       | Tritium 36   | 230   | 1323 (15/24)<br>(98 - 10639) | C14H<br>0.1 @ 315          | 2137 (8/12)<br>(98 - 10639) | 265 (4/12)<br>(116 - 543)         | 0   |
|  | γ Spec 36  |   |                              |                            |                             |                                   |   |
|  | Mn-54  | 4   | <LLD                         | -                          | -                           | <LLD                              | 0   |
|  | Fe-59  | 8   | <LLD                         | -                          | -                           | <LLD                              | 0   |
|  | Co-58  | 4   | 89 (1/24)                    | C14H<br>0.1 @ 315          | 89 (1/24)                   | <LLD                              | 0   |
|  | Co-60  | 4   | <LLD                         | -                          | -                           | <LLD                              | 0   |
|  | Zn-65  | 8   | <LLD                         | -                          | -                           | <LLD                              | 0   |
|  | Zr-Nb-95   | 7   | <LLD                         | -                          | -                           | <LLD                              | 0   |
|  | I-131  | 5   | <LLD                         | -                          | -                           | <LLD                              | 0   |
|  | Cs-134   | 5   | 38 (1/24)                    | C14H<br>0.1 @ 315          | 38 (1/24)                   | <LLD                              | 0   |
|  | Cs-137   | 4   | 52 (1/24)                    | C14H<br>0.1 @ 315          | 52 (1/24)                   | <LLD                              | 0   |
|  | Ba-La-140  | 11  | <LLD                         | -                          | -                           | <LLD                              | 0   |

(1) The "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 - 1992

pCi/L  $\gamma$  EMITTERS AND TRITIUM IN SEAWATER

| STATION | MONTH | H-3           | K-40         | Mn-54 | Fe-59 | Co-58 | Co-60 | Zn-65 | Zr-Nb-95 | I-131 | Cs-134 | Cs-137 | Ba-La-140 |
|---------|-------|---------------|--------------|-------|-------|-------|-------|-------|----------|-------|--------|--------|-----------|
| C13     | JAN   | 135 $\pm$ 48  | 212 $\pm$ 32 | <4    | <8    | <4    | <5    | <8    | <3       | <9    | <4     | <4     | <9        |
|         | FEB   | 268 $\pm$ 48  | 233 $\pm$ 35 | <4    | <8    | <4    | <4    | <7    | <7       | <4    | <5     | <4     | <10       |
|         | MAR   | 116 $\pm$ 44  | 196 $\pm$ 34 | <4    | <7    | <4    | <4    | <9    | <6       | <5    | <3     | <4     | <7        |
|         | APR   | <138          | 197 $\pm$ 33 | <5    | <8    | <4    | <5    | <7    | <5       | <5    | <5     | <5     | <6        |
|         | MAY   | <134          | 247 $\pm$ 35 | <4    | <7    | <4    | <5    | <9    | <5       | <5    | <4     | <3     | <7        |
|         | JUN   | 543 $\pm$ 56  | 247 $\pm$ 34 | <3    | <7    | <4    | <5    | <9    | <7       | <5    | <4     | <4     | <7        |
|         | JUL   | <141          | 273 $\pm$ 32 | <4    | <7    | <4    | <4    | <10   | <7       | <4    | <4     | <4     | <10       |
|         | AUG   | <136          | 189 $\pm$ 29 | <4    | <7    | <3    | <4    | <9    | <4       | <4    | <4     | <4     | <10       |
|         | SEP   | <140          | 213 $\pm$ 34 | <4    | <9    | <4    | <5    | <8    | <8       | <6    | <3     | <4     | <7        |
|         | OCT   | <124          | 246 $\pm$ 37 | <4    | <8    | <4    | <4    | <8    | <7       | <4    | <4     | <4     | <11       |
|         | NOV   | <132          | 263 $\pm$ 38 | <4    | <7    | <5    | <3    | <8    | <5       | <4    | <4     | <4     | <8        |
|         | DEC   | <130          | 283 $\pm$ 35 | <4    | <8    | <4    | <4    | <10   | <7       | <5    | <3     | <4     | <6        |
| C14G    | JAN   | 130 $\pm$ 43  | 249 $\pm$ 35 | <4    | <9    | <4    | <5    | <9    | <7       | <4    | <5     | <4     | <6        |
|         | FEB   | 497 $\pm$ 54  | 258 $\pm$ 31 | <4    | <6    | <4    | <4    | <8    | <7       | <4    | <5     | <4     | <11       |
|         | MAR   | 140 $\pm$ 44  | 222 $\pm$ 38 | <3    | <7    | <5    | <4    | <9    | <8       | <5    | <4     | <4     | <6        |
|         | APR   | 180 $\pm$ 47  | 227 $\pm$ 44 | <4    | <8    | <4    | <4    | <8    | <7       | <5    | <4     | <4     | <6        |
|         | MAY   | <134          | 263 $\pm$ 34 | <4    | <7    | <3    | <5    | <9    | <6       | <4    | <5     | <3     | <8        |
|         | JUN   | 196 $\pm$ 49  | 235 $\pm$ 39 | <4    | <8    | <4    | <5    | <8    | <6       | <6    | <5     | <4     | <8        |
|         | JUL   | <141          | 219 $\pm$ 35 | <4    | <8    | <4    | <4    | <9    | <7       | <4    | <5     | <5     | <9        |
|         | AUG   | <136          | 252 $\pm$ 34 | <4    | <7    | <4    | <5    | <7    | <6       | <4    | <5     | <4     | <9        |
|         | SEP   | 1085 $\pm$ 63 | 247 $\pm$ 40 | <4    | <9    | <4    | <5    | <7    | <6       | <6    | <5     | <3     | <7        |
|         | OCT   | <124          | 163 $\pm$ 31 | <4    | <7    | <4    | <5    | <11   | <7       | <4    | <5     | <4     | <6        |
|         | NOV   | <132          | 227 $\pm$ 31 | <4    | <7    | <3    | <5    | <9    | <7       | <5    | <4     | <4     | <8        |
|         | DEC   | 525 $\pm$ 51  | 242 $\pm$ 34 | <3    | <9    | <4    | <4    | <9    | <6       | <5    | <5     | <4     | <5        |



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

FLORIDA POWER CORP. - CR3 - 1992

pCi/L  $\gamma$  EMITTERS AND TRITIUM IN SEAWATER

| STATION | MONTH | H-3             | K-40         | Mn-54 | Fe-59 | Co-58      | Co-60 | Zn-65 | Zr-Nb-95 | I-131 | Cs-134     | Cs-137     | Ba-La-140 |
|---------|-------|-----------------|--------------|-------|-------|------------|-------|-------|----------|-------|------------|------------|-----------|
| C14H    | JAN   | 10639 $\pm$ 161 | 251 $\pm$ 45 | <5    | <8    | 89 $\pm$ 5 | <6    | <9    | <7       | <6    | 38 $\pm$ 2 | 52 $\pm$ 4 | <6        |
|         | FEB   | 4748 $\pm$ 115  | 227 $\pm$ 32 | <4    | <7    | <4         | <4    | <8    | <5       | <4    | <6         | <4         | <5        |
|         | MAR   | 101 $\pm$ 43    | 217 $\pm$ 34 | <3    | <9    | <3         | <6    | <9    | <6       | <5    | <3         | <4         | <6        |
|         | APR   | <138            | 255 $\pm$ 35 | <3    | <10   | <3         | <6    | <10   | <6       | <5    | <3         | <4         | <5        |
|         | MAY   | 134 $\pm$ 44    | 196 $\pm$ 29 | <4    | <10   | <4         | <4    | <9    | <7       | <4    | <4         | <3         | <7        |
|         | JUN   | 192 $\pm$ 45    | 194 $\pm$ 32 | <3    | <10   | <5         | <5    | <7    | <7       | <7    | <3         | <4         | <7        |
|         | JUL   | <141            | 230 $\pm$ 34 | <3    | <8    | <3         | <4    | <9    | <6       | <4    | <5         | <4         | <9        |
|         | AUG   | <136            | 193 $\pm$ 33 | <3    | <9    | <4         | <4    | <9    | <6       | <4    | <4         | <4         | <9        |
|         | SEP   | 98 $\pm$ 45     | 248 $\pm$ 35 | <4    | <8    | <4         | <5    | <9    | <6       | <6    | <4         | <4         | <4        |
|         | OCT   | 251 $\pm$ 45    | 284 $\pm$ 36 | <4    | <7    | <4         | <5    | <8    | <7       | <4    | <3         | <4         | <7        |
|         | NOV   | <132            | 220 $\pm$ 34 | <3    | <9    | <4         | <4    | <11   | <6       | <5    | <4         | <3         | <8        |
|         | DEC   | 934 $\pm$ 59    | 201 $\pm$ 32 | <3    | <8    | <3         | <4    | <10   | <8       | <5    | <4         | <4         | <7        |

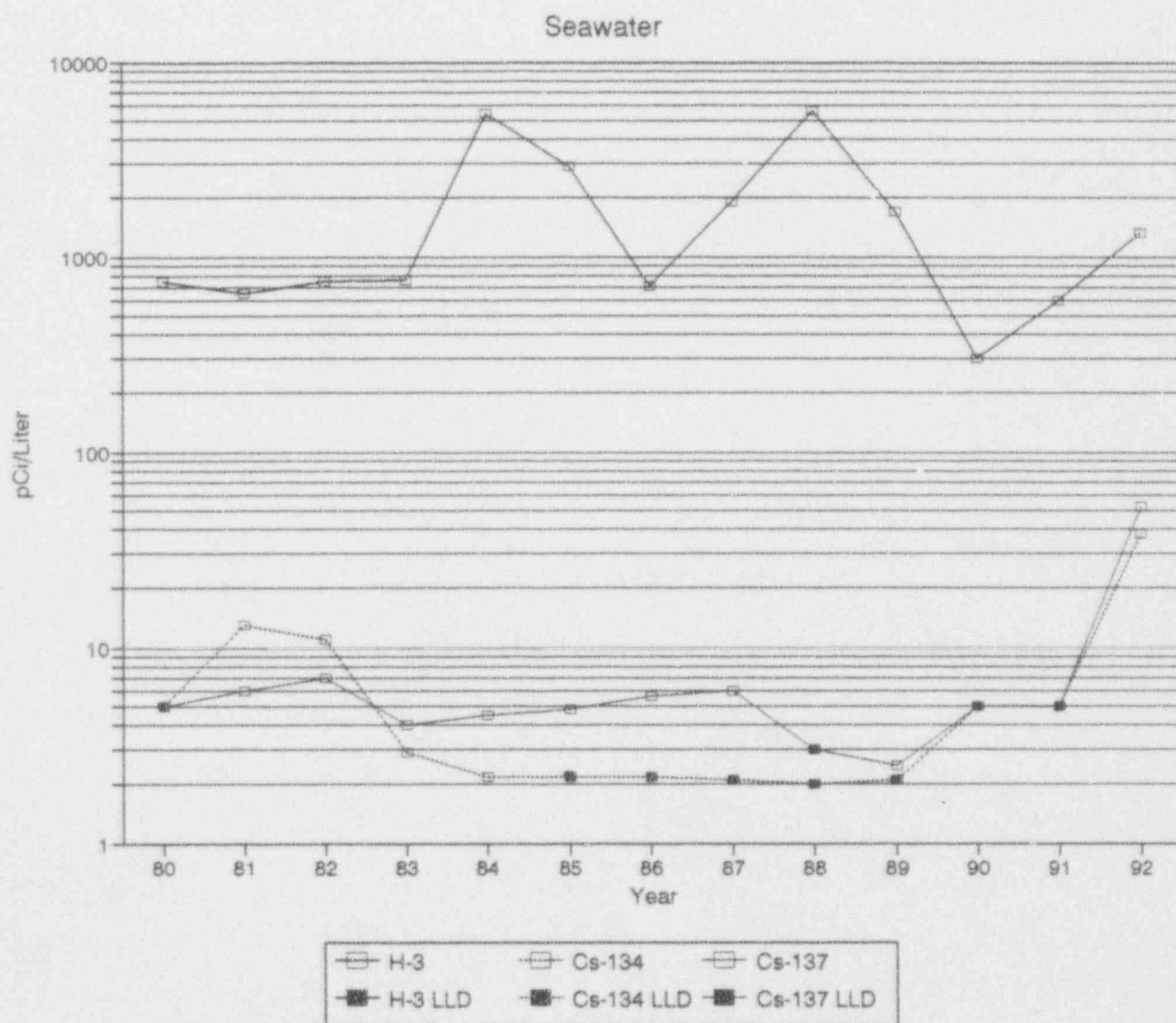


TABLE IV-C.2  
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY  
CRYSTAL RIVER UNIT 3                      DOCKET NO. 5-302  
CITRUS COUNTY, FLORIDA                      JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br>(UNITS) | ANALYSIS AND<br>TOTAL NUMBER<br>OF ANALYSES<br>PERFORMED | LOWER LIMIT<br>OF DETECTION<br>(LLD) <sup>(1)</sup> | ALL INDICATOR LOCATIONS | LOCATION WITH HIGHEST MEAN |               | CONTROL LOCATION<br>MEAN<br>RANGE | NUMBER OF<br>NONROUTINE<br>REPORTED<br>MEASUREMENTS |
|--|--|---|-------------------------|----------------------------|---------------|-----------------------------------|---|
|  |  |   | MEAN<br>RANGE           | NAME<br>DISTANCE & BEARING | MEAN<br>RANGE |                                   |   |
| GROUND<br>WATER<br>(pCi/L)                 | Tritium 2  | 230   | None                    | -                          | -             | <LLD                              | 0   |
|  | γ Spec 2   |   |                         |                            |               |                                   |   |
|  | Mn-54  | 4   | None                    | -                          | -             | <LLD                              | 0   |
|  | Fe-59  | 8   | None                    | -                          | -             | <LLD                              | 0   |
|  | Co-58  | 4   | None                    | -                          | -             | <LLD                              | 0   |
|  | Co-60  | 4   | None                    | -                          | -             | <LLD                              | 0   |
|  | Zn-65  | 8   | None                    | -                          | -             | <LLD                              | 0   |
|  | Zr-Nb-95   | 7   | None                    | -                          | -             | <LLD                              | 0   |
|  | I-131  | 5   | None                    | -                          | -             | <LLD                              | 0   |
|  | Cs-134   | 5   | None                    | -                          | -             | <LLD                              | 0   |
|  | Cs-137   | 4   | None                    | -                          | -             | <LLD                              | 0   |
|  | Ba-La-140  | 11  | None                    | -                          | -             | <LLD                              | 0   |

(1) The "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 - 1992

pCi/L  $\gamma$  EMITTERS AND TRITIUM IN GROUND WATER

| STATION | NUCLIDE   | FIRST HALF | SECOND HALF |
|---------|-----------|------------|-------------|
| C40     | H-3       | <139       | <140        |
|         | Mn-54     | <5         | <3          |
|         | Fe-59     | <9         | <8          |
|         | Co-58     | <4         | <4          |
|         | Co-60     | <5         | <5          |
|         | Zn-65     | <7         | <9          |
|         | Zr-Nb-95  | <7         | <8          |
|         | I-131     | <5         | <5          |
|         | Cs-134    | <4         | <4          |
|         | Cs-137    | <5         | <4          |
|         | Ba-La-140 | <3         | <11         |
|         | K-40      | <76        | <61         |

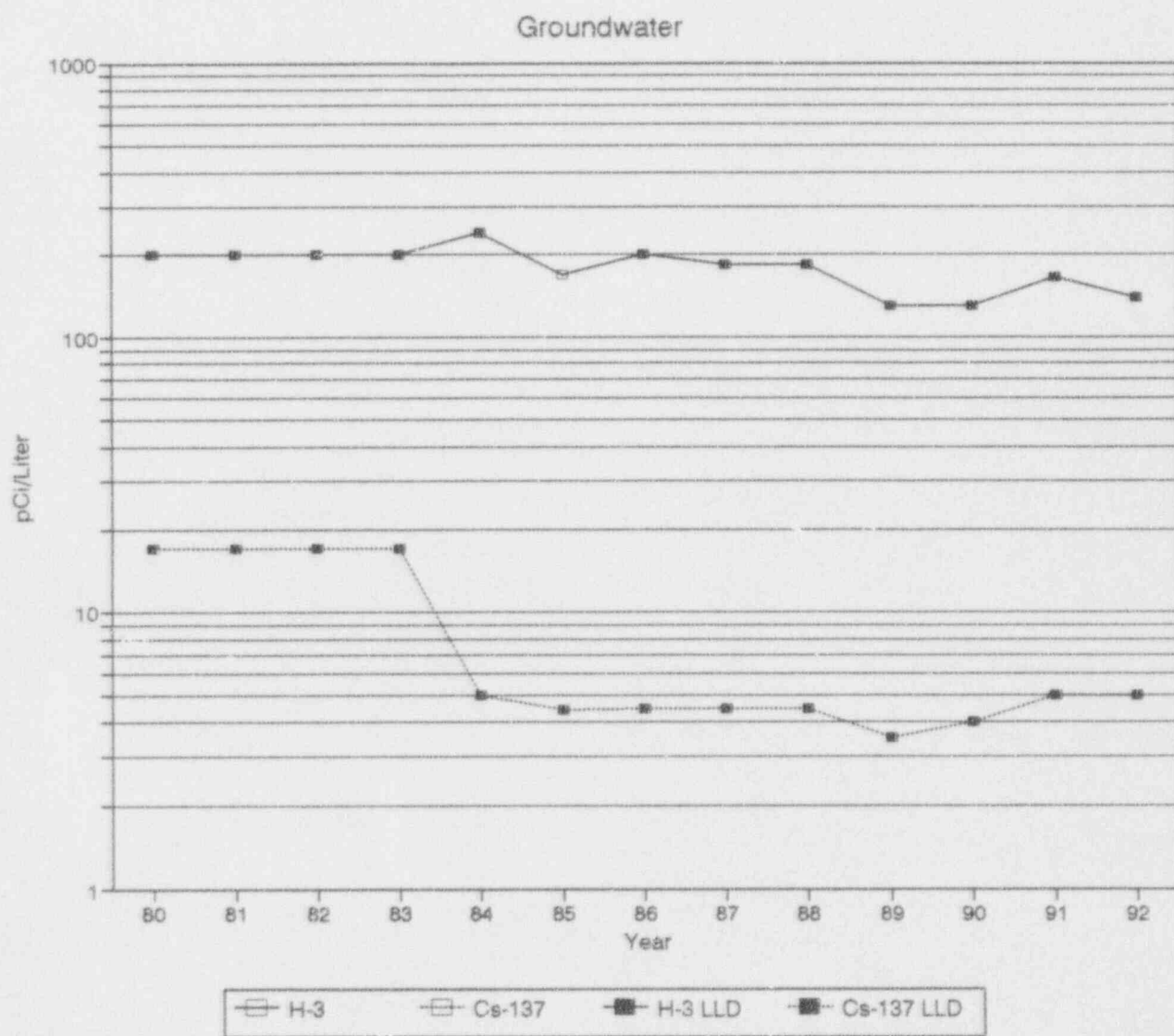


TABLE IV-C.3

## RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 5-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br>(UNITS) | ANALYSIS AND             | LOWER LIMIT<br>OF DETECTION<br>(LLD) <sup>(1)</sup> | ALL INDICATOR LOCATIONS | LOCATION WITH HIGHEST MEAN |      | CONTROL LOCATION | NUMBER OF  |
|--|--------------------------|---|-------------------------|----------------------------|------|------------------|------------|
|  | TOTAL NUMBER             |   | MEAN                    | NAME                       | MEAN | MEAN             | NONROUTINE |
|  | OF ANALYSES<br>PERFORMED |   |                         |                            |      |                  |            |
| DRINKING<br>WATER<br>(pCi/L)               | Tritium 12               | 230   | None                    | -                          | -    | <LLD             | 0          |
|  | γ Spec 12                |   |                         |                            |      |                  |            |
|  | Mn-54                    | 4   | None                    | -                          | -    | <LLD             | 0          |
|  | Fe-59                    | 8   | None                    | -                          | -    | <LLD             | 0          |
|  | Co-58                    | 4   | None                    | -                          | -    | <LLD             | 0          |
|  | Co-60                    | 4   | None                    | -                          | -    | <LLD             | 0          |
|  | Zn-65                    | 8   | None                    | -                          | -    | <LLD             | 0          |
|  | Zr-Nb-95                 | 7   | None                    | -                          | -    | <LLD             | 0          |
|  | I-131                    | 5   | None                    | -                          | -    | <LLD             | 0          |
|  | Cs-134                   | 5   | None                    | -                          | -    | <LLD             | 0          |
|  | Cs-137                   | 4   | None                    | -                          | -    | <LLD             | 0          |
|  | Ba-La-140                | 11  | None                    | -                          | -    | <LLD             | 0          |

(1) The "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 - 1992

pCi/L  $\gamma$  EMITTERS AND TRITIUM IN DRINKING WATER

| STATION | DATE  | H-3  | K-40 | Mn-54 | Fe-59 | Co-58 | Co-60 | Zn-65 | Zn-Nb-95 | I-131 | Cs-134 | Cs-137 | Ba-La-140 |
|---------|-------|------|------|-------|-------|-------|-------|-------|----------|-------|--------|--------|-----------|
| C07     | 01-07 | <147 | <58  | <4    | <6    | <3    | <5    | <8    | <4       | <4    | <4     | <3     | <8        |
|         | 04-07 | <143 | <59  | <3    | <6    | <3    | <3    | <8    | <6       | <4    | <4     | <4     | <9        |
|         | 07-06 | <141 | <53  | <4    | <6    | <3    | <4    | <9    | <6       | <4    | <5     | <4     | <10       |
|         | 10-15 | <124 | <62  | <4    | <8    | <4    | <4    | <8    | <6       | <9    | <4     | <4     | <7        |
| C10     | 01-07 | <147 | <69  | <5    | <9    | <5    | <4    | <9    | <7       | <5    | <6     | <4     | <10       |
|         | 04-07 | <143 | <66  | <4    | <9    | <5    | <5    | <8    | <7       | <5    | <5     | <5     | <13       |
|         | 07-06 | <141 | <58  | <5    | <9    | <5    | <5    | <8    | <6       | <5    | <4     | <5     | <13       |
|         | 10-15 | <124 | <67  | <3    | <9    | <4    | <4    | <9    | <7       | <9    | <3     | <3     | <8        |
| C18     | 01-07 | <147 | <53  | <4    | <6    | <4    | <4    | <7    | <6       | <4    | <4     | <4     | <8        |
|         | 04-07 | <138 | <69  | <4    | <6    | <4    | <4    | <9    | <5       | <3    | <4     | <4     | <9        |
|         | 07-06 | <141 | <55  | <3    | <8    | <3    | <4    | <7    | <6       | <3    | <4     | <4     | <8        |
|         | 10-15 | <124 | <73  | <4    | <8    | <4    | <4    | <7    | <8       | <9    | <5     | <4     | <8        |

# Drinking Water

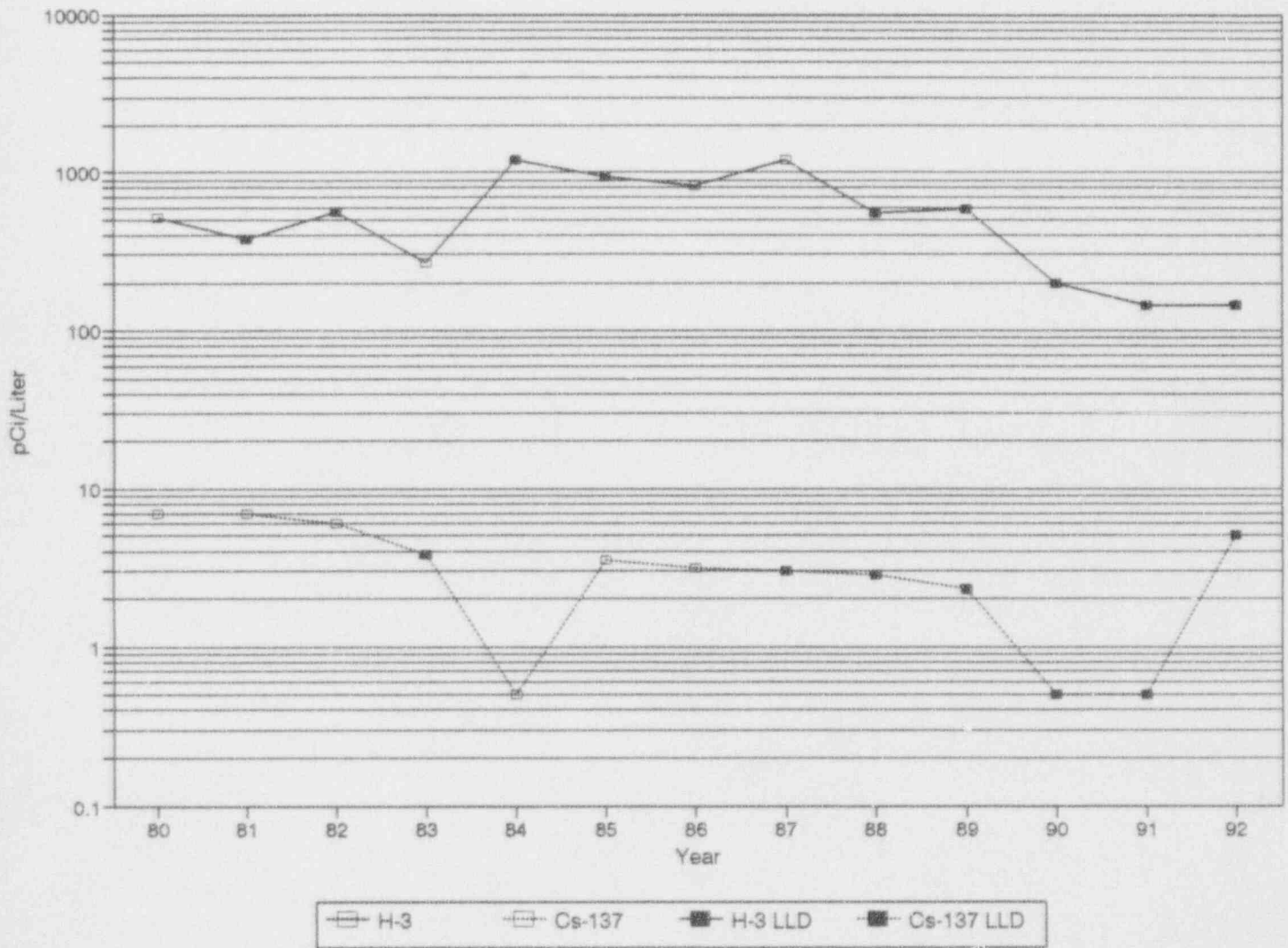


TABLE IV-C.4  
 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY  
 CRYSTAL RIVER UNIT 3                      DOCKET NO. 5-302  
 CITRUS COUNTY, FLORIDA                      JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br>(UNITS) | ANALYSIS AND<br>TOTAL NUMBER<br>OF ANALYSES<br>PERFORMED | LOWER LIMIT<br>OF DETECTION<br>(LLD) <sup>(1)</sup> | <u>ALL INDICATOR LOCATIONS</u> | <u>LOCATION WITH HIGHEST MEAN</u> |               | CONTROL LOCATION<br>MEAN<br>RANGE | NUMBER OF<br>NONROUTINE<br>REPORTED<br>MEASUREMENTS |
|--|--|---|--------------------------------|-----------------------------------|---------------|-----------------------------------|---|
|  |  |   | MEAN<br>RANGE                  | NAME<br>DISTANCE & BEARING        | MEAN<br>RANGE |                                   |   |
| SHORELINE<br>SEDIMENT<br>(pCi/kg)          | 7 Spec 8   |   |                                |                                   |               |                                   |   |
|  | Cs-134   | 14  | 189 (2/6)                      | C14H<br>0.1 @ 315                 | 351 (1/2)     | <LLD                              | 0   |
|  | Cs-137   | 12  | 194 (4/6)<br>(14 - 621)        | C14H<br>0.1 @ 315                 | 621 (1/2)     | <LLD                              | 0   |

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

TABLE IV-C.4.a

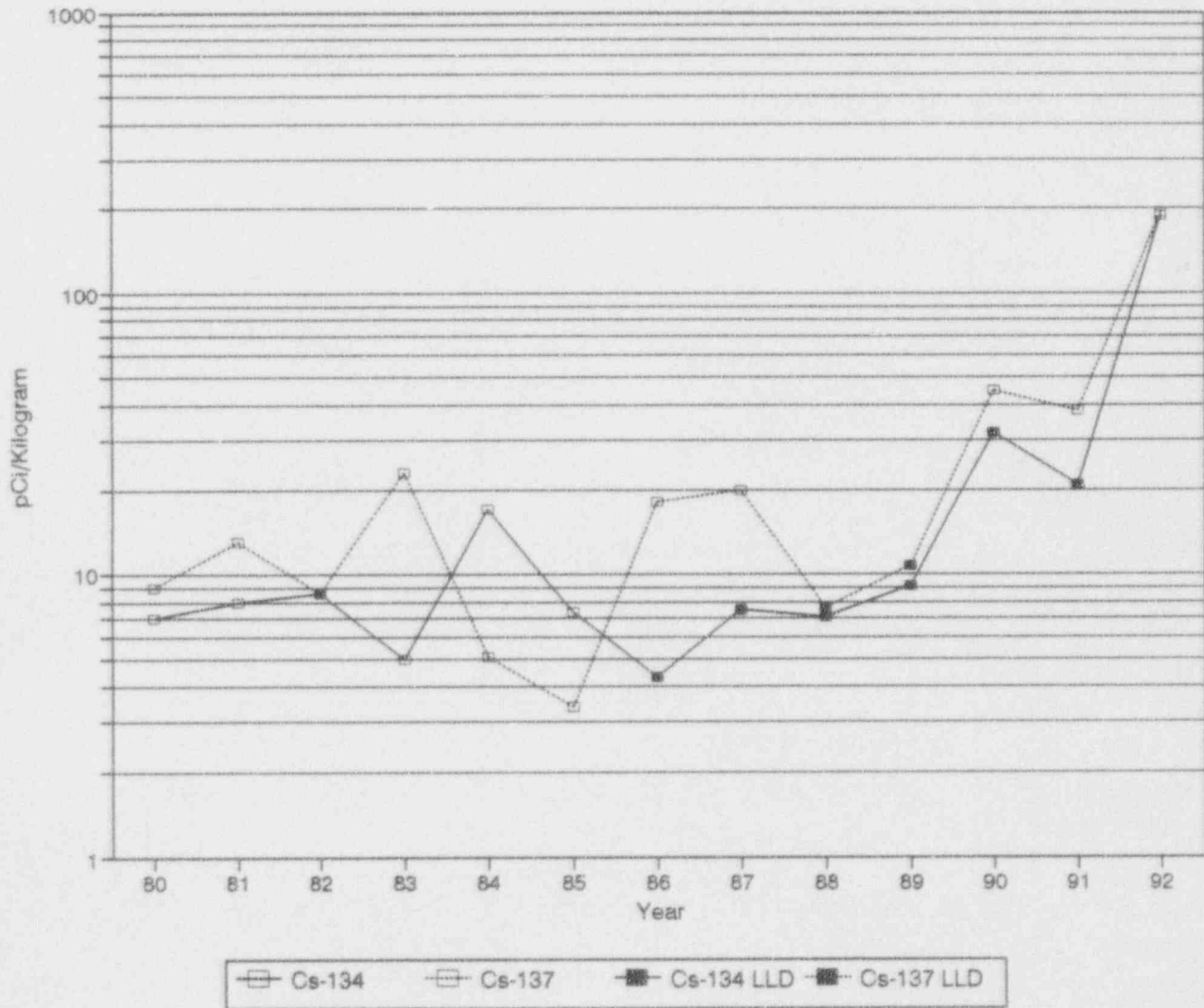
FLORIDA POWER CORP. - CR3 - 1992

pCi/kg  $\gamma$  EMITTERS IN SHORELINE SEDIMENT

| STATION | PERIOD         | Cs-134       | Cs-137       | Co-58          | Co-60         | K-40           | Ra-226        |
|---------|----------------|--------------|--------------|----------------|---------------|----------------|---------------|
| C09(1)  | First Half     | <10          | <9           | <8             | <9            | 344 $\pm$ 54   | 327 $\pm$ 9   |
|         | Second Half    | <12          | 13 $\pm$ 4   | <7             | <10           | 362 $\pm$ 65   | 417 $\pm$ 18  |
| C14H    | First Half     | 351 $\pm$ 20 | 621 $\pm$ 27 | 13530 $\pm$ 90 | 8195 $\pm$ 53 | 2018 $\pm$ 159 | 720 $\pm$ 35  |
|         | Second Half    | <21          | <24          | 5612 $\pm$ 29  | 1595 $\pm$ 14 | 533 $\pm$ 66   | 1442 $\pm$ 26 |
| C14M    | First Half (2) | 26 $\pm$ 5   | 126 $\pm$ 9  | 561 $\pm$ 18   | 241 $\pm$ 9   | 1242 $\pm$ 108 | 964 $\pm$ 17  |
|         | Second Half    | <13          | <14          | 161 $\pm$ 10   | 156 $\pm$ 7   | 246 $\pm$ 66   | 484 $\pm$ 20  |
| C14G    | First Half     | <12          | 14 $\pm$ 4   | 41 $\pm$ 6     | 37 $\pm$ 4    | 283 $\pm$ 56   | 841 $\pm$ 22  |
|         | Second Half    | <19          | 14 $\pm$ 4   | 104 $\pm$ 5    | 115 $\pm$ 4   | 218 $\pm$ 47   | 800 $\pm$ 15  |

(1) C09 is the control station at Ft. Gulf Island Beach. C14H, M, & G are discharge canal stations.  
 first half samples taken 2-07-92.  
 second half samples taken 8-25-92.

# Shoreline Sediment



#### IV-D. INGESTION PATHWAY

To evaluate the ingestion pathway, fish, oysters, citrus, and watermelon samples are taken.

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. Cobalt-58 was identified in one sample at station C29 at a level of 28 pCi/kg. Cesium-137 was identified in one sample taken near the mouth of the intake canal at a level of 12 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 for, cobalt-58, at an average concentration of 98 pCi/kg, was identified in samples taken at the end of the discharge canal.
3. Monthly broadleaf vegetation samples were taken at two indicator locations, C48a and C48b, and one control location, C47. Nine of twenty-four indicator samples had measurable amounts of Cs-137 with an average concentration of 59 pCi/kg and a range of 21 to 155 pCi/kg. All control station samples had measurable amounts of Cs-137 with an average of 101 pCi/kg and a range of 26 to 261 pCi/kg.
4. Annual watermelon and citrus (oranges) samples are taken at stations C04 and C19, respectively. Cesium-137 was measured in the citrus sample at a level of 8 pCi/kg, and at a level of 4 pCi/kg in watermelon.



TABLE IV-D.1  
 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY  
 CRYSTAL RIVER UNIT 3 DOCKET NO. 5-302  
 CITRUS COUNTY, FLORIDA JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br>(UNITS) | ANALYSIS AND<br>TOTAL NUMBER<br>OF ANALYSES<br>PERFORMED | LOWER LIMIT<br>OF DETECTION<br>(LLD) <sup>(1)</sup> | ALL INDICATOR LOCATIONS | LOCATION WITH HIGHEST MEAN |               | CONTROL LOCATION<br>MEAN<br>RANGE | NUMBER OF<br>NONROUTINE<br>REPORTED<br>MEASUREMENTS |
|--|--|---|-------------------------|----------------------------|---------------|-----------------------------------|---|
|  |  |   | MEAN<br>RANGE           | NAME<br>DISTANCE & BEARING | MEAN<br>RANGE |                                   |   |
| CARNIVOROUS<br>FISH<br>(pCi/kg)            | 7 Spec 8   |   |                         |                            |               |                                   |   |
|  | Mn-54  | 9   | <LLD                    | -                          | -             | <LLD                              | 0   |
|  | Fe-59  | 16  | <LLD                    | -                          | -             | <LLD                              | 0   |
|  | Co-58  | 9   | 28 (1/4)                | C29<br>2 @ 270             | 28 (1/4)      | <LLD                              | 0   |
|  | Co-60  | 10  | <LLD                    | -                          | -             | <LLD                              | 0   |
|  | Zn-65  | 17  | <LLD                    | -                          | -             | <LLD                              | 0   |
|  | Cs-134   | 9   | <LLD                    | -                          | -             | <LLD                              | 0   |
|  | Cs-137   | 9   | <LLD                    | C30<br>3.6 @ 240           | 12 (1/4)      | <LLD                              | 0   |

(1) The "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 - 1992

pCi/kg  $\gamma$  EMITTERS IN CARNIVOROUS FISH

| STATION | QUARTER | Mn-54 | Co-58      | Co-60 | Fe-59 | Zn-65 | Cs-134 | Cs-137     | K-40 |
|---------|---------|-------|------------|-------|-------|-------|--------|------------|------|
| C29     | 1       | <7    | $28 \pm 4$ | <10   | <16   | <17   | <10    | <9         | 2240 |
|         | 2       | <10   | <10        | <13   | <25   | <22   | <11    | <10        | 2406 |
|         | 3       | <13   | <18        | <23   | <31   | <29   | <19    | <18        | 2703 |
|         | 4       | <12   | <12        | <16   | <25   | <30   | <14    | <12        | 2865 |
| C30     | 1       | <53   | <48        | <64   | <100  | <120  | <61    | <49        | 2247 |
|         | 2       | <9    | <11        | <17   | <29   | <28   | <13    | <13        | 1982 |
|         | 3       | <9    | <10        | <14   | <25   | <34   | <14    | $12 \pm 6$ | 2425 |
|         | 4       | <8    | <9         | <16   | <24   | <23   | <10    | <12        | 2482 |

# Carnivorous Fish

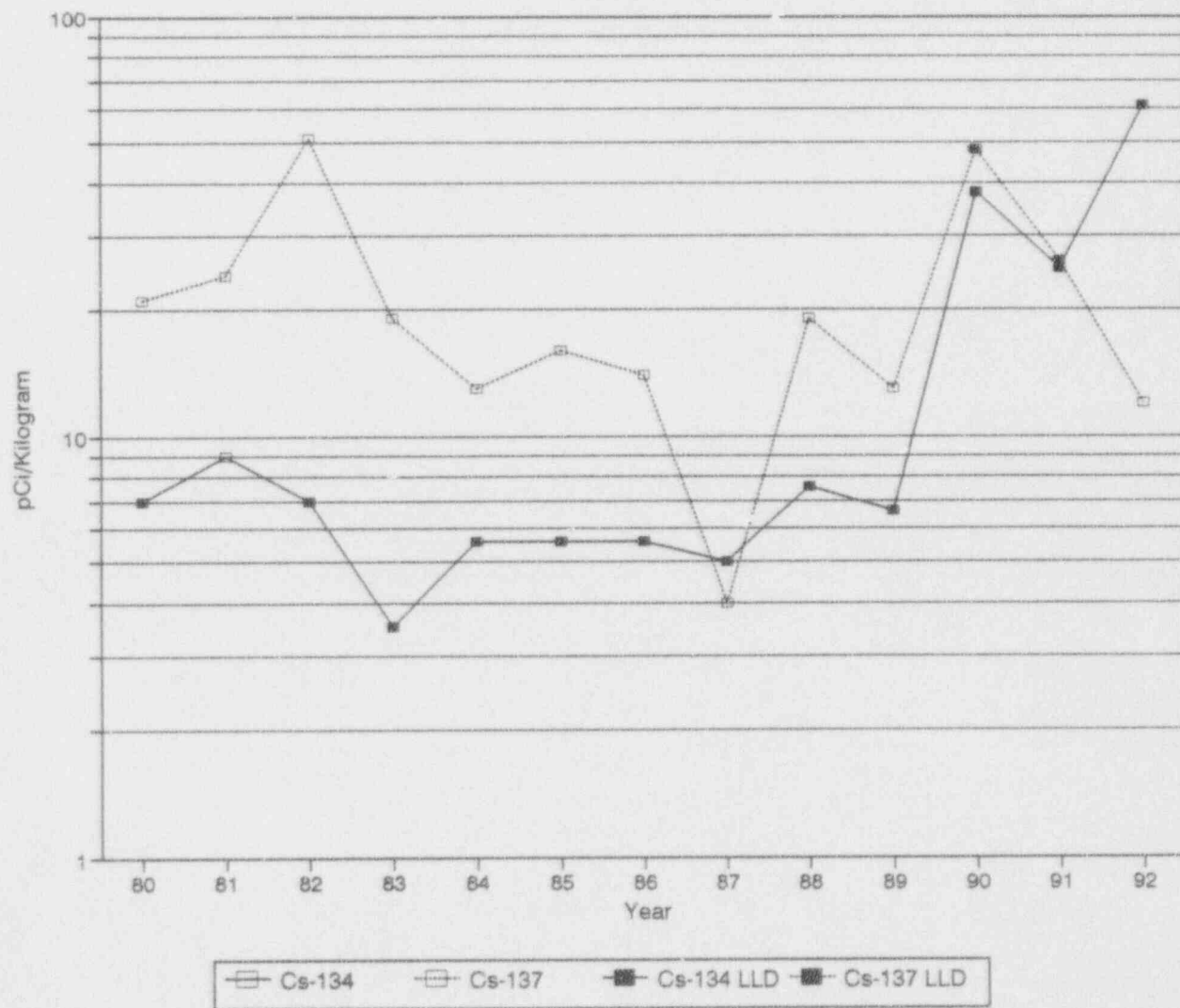


TABLE IV-D.2

## RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 5-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br>(UNITS) | ANALYSIS AND<br>TOTAL NUMBER<br>OF ANALYSES<br>PERFORMED | LOWER LIMIT<br>OF DETECTION<br>(LLD) <sup>(1)</sup> | <u>ALL INDICATOR LOCATIONS</u> | <u>LOCATION WITH HIGHEST MEAN</u> |                      | CONTROL LOCATION<br>MEAN<br>RANGE | NUMBER OF<br>NONROUTINE<br>REPORTED<br>MEASUREMENTS |
|--|--|---|--------------------------------|-----------------------------------|----------------------|-----------------------------------|---|
|  |  |   | MEAN<br>RANGE                  | NAME<br>DISTANCE & BEARING        | MEAN<br>RANGE        |                                   |   |
| OYSTERS<br>(pCi/kg)                        | 7 Spec 8   |   |                                |                                   |                      |                                   |   |
|  | Mn-54  | 9   | <LLD                           | -                                 | -                    | <LLD                              | 0   |
|  | Fe-59  | 16  | <LLD                           | -                                 | -                    | <LLD                              | 0   |
|  | Co-58  | 9   | 98 (3/4)<br>(33-181)           | C29<br>2 @ 270                    | 98 (3/4)<br>(33-181) | <LLD                              | 0   |
|  | Co-60  | 10  | <LLD                           | -                                 | -                    | <LLD                              | 0   |
|  | Zn-65  | 17  | <LLD                           | -                                 | -                    | <LLD                              | 0   |
|  | Cs-134   | 9   | <LLD                           | -                                 | -                    | <LLD                              | 0   |
|  | Cs-137   | 9   | <LLD                           | -                                 | -                    | <LLD                              | 0   |

(1) The "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 - 1992  
pCi/kg  $\gamma$  EMITTERS IN OYSTERS

| STATION | QUARTER | Mn-54 | Co-58        | Co-60 | Fe-59 | Zn-65 | Cs-134 | Cs-137 | K-40 |
|---------|---------|-------|--------------|-------|-------|-------|--------|--------|------|
| C29     | 1       | <48   | 181 $\pm$ 30 | <67   | <88   | <94   | <55    | <65    | 1061 |
|         | 2       | <46   | 79 $\pm$ 22  | <50   | <111  | <106  | <46    | <55    | 1741 |
|         | 3       | <29   | 33 $\pm$ 11  | <37   | <56   | <70   | <32    | <39    | 1319 |
|         | 4       | <13   | <21          | <26   | <42   | <45   | <22    | <29    | 1714 |
| C30     | 1       | <44   | <53          | <45   | <87   | <112  | <44    | <47    | 942  |
|         | 2       | <49   | <54          | <67   | <135  | <128  | <55    | <52    | 2500 |
|         | 3       | <31   | <36          | <37   | <101  | <115  | <52    | <42    | 957  |
|         | 4       | <13   | <14          | <16   | <26   | <31   | <15    | <14    | 1690 |

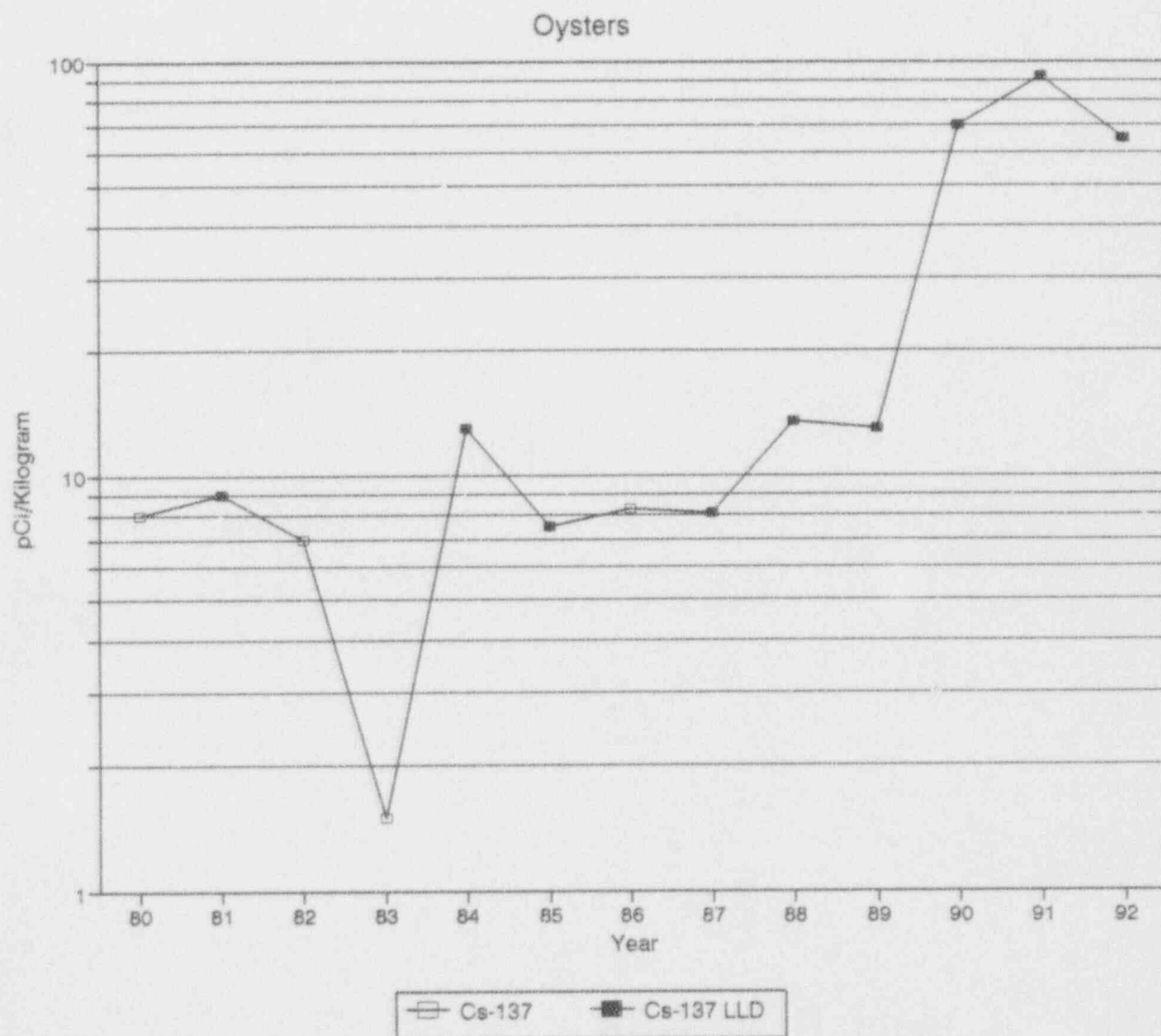




TABLE IV-D.3

## RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 5-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br>(UNITS) | ANALYSIS AND<br>TOTAL NUMBER<br>OF ANALYSES<br>PERFORMED | LOWER LIMIT<br>OF DETECTION<br>(LLD) <sup>(1)</sup> | <u>ALL INDICATOR LOCATIONS</u> | <u>LOCATION WITH HIGHEST MEAN</u> |                           | CONTROL LOCATION<br>MEAN<br>RANGE | NUMBER OF<br>NONROUTINE<br>REPORTED<br>MEASUREMENTS |
|--|--|---|--------------------------------|-----------------------------------|---------------------------|-----------------------------------|---|
|  |  |   | MEAN<br>RANGE                  | NAME<br>DISTANCE & BEARING        | MEAN<br>RANGE             |                                   |   |
| VEGETATION<br>(pCi/kg)                     | γ Spec 36  |   |                                |                                   |                           |                                   |   |
|  | I-131  | 9   | <LLD                           | -                                 | -                         | <LLD                              | 0   |
|  | Cs-134   | 8   | <LLD                           | -                                 | -                         | <LLD                              | 0   |
|  | Cs-137   | 8   | 59 (9/24)<br>(21 - 155)        | C47<br>80 @ 110°                  | 101 (12/12)<br>(26 - 261) | 101 (12/12)<br>(26 - 261)         | 0   |

(1) The "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 - 1992

pCi/kg OF  $\gamma$  EMITTERS IN BROAD LEAF VEGETATION

| STATION | MONTH | I-131 | Cs-134 | Cs-137       | K-40           |
|---------|-------|-------|--------|--------------|----------------|
| C47     | JAN   | <16   | <20    | 143 $\pm$ 14 | 4003 $\pm$ 242 |
|         | FEB   | <16   | <18    | 81 $\pm$ 12  | 2792 $\pm$ 195 |
|         | MAR   | <12   | <14    | 45 $\pm$ 5   | 3430 $\pm$ 161 |
|         | APR   | <28   | <19    | 261 $\pm$ 19 | 4015 $\pm$ 256 |
|         | MAY   | <13   | <11    | 27 $\pm$ 6   | 4748 $\pm$ 202 |
|         | JUN   | <19   | <12    | 58 $\pm$ 8   | 3358 $\pm$ 163 |
|         | JUL   | <14   | <18    | 165 $\pm$ 14 | 2125 $\pm$ 189 |
|         | AUG   | <11   | <13    | 26 $\pm$ 6   | 2639 $\pm$ 161 |
|         | SEP   | <13   | <18    | 138 $\pm$ 12 | 2920 $\pm$ 191 |
|         | OCT   | <21   | <26    | 92 $\pm$ 17  | 3986 $\pm$ 288 |
|         | NOV   | <11   | <13    | 87 $\pm$ 9   | 3214 $\pm$ 180 |
|         | DEC   | <16   | <15    | 86 $\pm$ 11  | 2351 $\pm$ 169 |
| C48A    | JAN   | <23   | <21    | <21          | 4004 $\pm$ 251 |
|         | FEB   | <17   | <13    | 61 $\pm$ 9   | 1278 $\pm$ 137 |
|         | MAR   | <11   | <15    | 50 $\pm$ 7   | 2807 $\pm$ 167 |
|         | APR   | <53   | <16    | 155 $\pm$ 13 | 2656 $\pm$ 185 |
|         | MAY   | <13   | <12    | 21 $\pm$ 7   | 2750 $\pm$ 159 |
|         | JUN   | <20   | <12    | <15          | 4753 $\pm$ 200 |
|         | JUL   | <14   | <14    | <17          | 6277 $\pm$ 244 |
|         | AUG   | <12   | <14    | <14          | 3259 $\pm$ 174 |
|         | SEP   | <17   | <20    | 42 $\pm$ 10  | 3266 $\pm$ 219 |
|         | OCT   | <15   | <16    | <21          | 1648 $\pm$ 167 |
|         | NOV   | <14   | <20    | <18          | 3990 $\pm$ 221 |
|         | DEC   | <16   | <21    | <21          | 2732 $\pm$ 192 |

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

FLORIDA POWER CORP. - CR3 - 1992

pCi/kg OF  $\gamma$  EMITTERS IN BROAD LEAF VEGETATION

| STATION | MONTH | I-131 | Cs-134 | Cs-137      | K-40           |
|---------|-------|-------|--------|-------------|----------------|
| C48B    | JAN   | <14   | <14    | <19         | 5309 $\pm$ 225 |
|         | FEB   | <13   | <12    | 23 $\pm$ 7  | 1254 $\pm$ 137 |
|         | MAR   | <11   | <13    | <15         | 4629 $\pm$ 188 |
|         | APR   | <24   | <19    | 92 $\pm$ 11 | 3558 $\pm$ 221 |
|         | MAY   | <15   | <12    | <14         | 6831 $\pm$ 232 |
|         | JUN   | <21   | <15    | <24         | 4325 $\pm$ 218 |
|         | JUL   | <14   | <14    | 52 $\pm$ 8  | 2769 $\pm$ 174 |
|         | AUG   | <12   | <15    | <15         | 5755 $\pm$ 229 |
|         | SEP   | <10   | <12    | <13         | 4128 $\pm$ 170 |
|         | OCT   | <14   | <14    | 37 $\pm$ 7  | 3599 $\pm$ 207 |
|         | NOV   | <9    | <11    | <16         | 3432 $\pm$ 148 |
|         | DEC   | <16   | <21    | <21         | 4240 $\pm$ 260 |

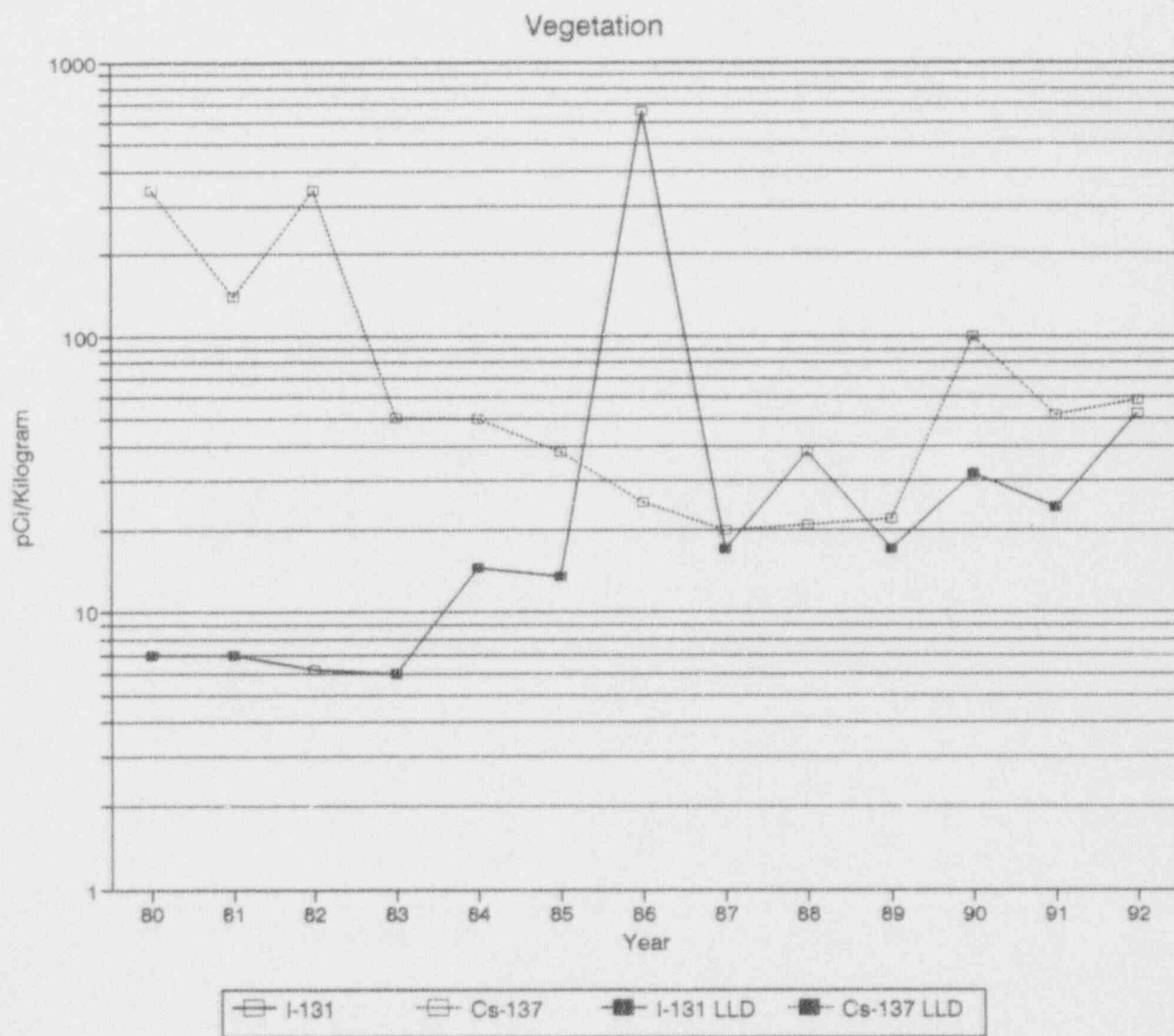


TABLE IV-D.4  
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY  
CRYSTAL RIVER UNIT 3                      DOCKET NO. 5-302  
CITRUS COUNTY, FLORIDA                      JANUARY 1 TO DECEMBER 31, 1992

| MEDIUM OR<br>PATHWAY<br>SAMPLED<br>(UNITS) | ANALYSIS AND<br>TOTAL NUMBER<br>OF ANALYSES<br>PERFORMED | LOWER LIMIT<br>OF DETECTION<br>(LLD) <sup>(1)</sup> | ALL INDICATOR LOCATIONS | LOCATION WITH HIGHEST MEAN |               | CONTROL LOCATION<br>MEAN<br>RANGE | NUMBER OF<br>NONROUTINE<br>REPORTED<br>MEASUREMENTS |
|--|--|---|-------------------------|----------------------------|---------------|-----------------------------------|---|
|  |  |   | MEAN<br>RANGE           | NAME<br>DISTANCE & BEARING | MEAN<br>RANGE |                                   |   |
| WATERMELON<br>(pCi/kg)                     | 7 Spec 1   |   |                         |                            |               |                                   |   |
|  | I-131  | 9   | <LLD                    | -                          | -             | None                              | 0   |
|  | Cs-134   | 8   | <LLD                    | -                          | -             | None                              | 0   |
|  | Cs-137   | 8   | 4 (1/1)                 | C04<br>6.3 @ 60            | 4 (1/1)       | None                              | 0   |
| CITRUS<br>(pCi/kg)                         | 7 Spec 1   |   |                         |                            |               |                                   |   |
|  | I-131  | 9   | <LLD                    | -                          | -             | None                              | 0   |
|  | Cs-134   | 8   | <LLD                    | -                          | -             | None                              | 0   |
|  | Cs-137   | 8   | 8 (1/1)                 | C19<br>8.5 @ 65°           | 8 (1/1)       | None                              | 0   |

(1) The "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 - 1992  
 pCi/kg of 7 EMITTERS IN WATERMELON AND CITRUS

| STATION          | DATE     | 1-131 | Cs-134 | Cs-137 | K-40 |
|------------------|----------|-------|--------|--------|------|
| C04 - Watermelon | 06-20-90 | <5    | <5     | 4 ± 2  | 1333 |
| C19 - Citrus     | 01-07-92 | <5    | <6     | 8 ± 3  | 1982 |