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

Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
1986 Annual Radiological
Environmental Operating Report

This letter transmits the subject report in accordance with Technical Specification 6.9.4.b for Turkey Point Units 3 and 4.

Should there be any questions on this information, please contact us.

Very truly yours,

C. O. Woody
Group Vice President
Nuclear Energy

COW/SDF/gp

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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1986

ANNUAL

RADIOLOGICAL ENVIRONMENTAL

OPERATING REPORT

TURKEY POINT PLANT

UNIT NOS. 3 AND 4

License Nos. DPR-31, DPR-41

Docket Nos. 50-250, 50-251

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1986
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT - UNITS NOS. 3 AND 4

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1986
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT - UNITS NOS. 3 AND 4

I. INTRODUCTION

This report is submitted pursuant to Specification 6.9 of Turkey Point Units 3 & 4 Technical Specifications. The Annual Radiological Environmental Operating Report provides information, summaries and analytical results pertaining to the Radiological Environmental Monitoring Program for the calendar year indicated. This report covers surveillance activities meeting the requirements of Unit No. 3 and Unit No. 4. Technical Specifications.

II. RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

A. Purpose: The purpose of the radiological environmental monitoring program is to provide representative measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures of members of the public resulting from station operation. The radiological environmental monitoring program also supplements the radiological effluent monitoring program by verifying that the measureable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways.

B. Program Description: The Radiological Environmental Monitoring Program for the Turkey Point Plant is conducted pursuant to Technical Specifications 4.12 of Turkey Point Units 3 & 4 Technical Specifications.

1. Sample Locations, Types and Frequencies:

a. Direct radiation gamma exposure rate is monitored continuously at 21 locations by thermoluminescent dosimeters (TLD's). TLD's are collected and analyzed quarterly.

b. Airborne radioiodine and particulate samplers are operated continuously at five locations. Samples are collected and analyzed weekly. Analyses include Iodine-131, gross beta, and gamma isotopic measurements.

c. Surface water samples are collected from three locations. Samples are collected and analyzed monthly. Analyses include gamma isotopic and tritium measurements.

d. Shoreline sediment samples are collected from three locations coinciding with the locations for surface water samples. Samples are collected and analyzed semi-annually. Sediment samples are analyzed by gamma isotopic measurements.

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e. Fish and invertebrate samples are each collected from the two locations coinciding with two of the locations for surface water samples. Samples are collected and analyzed semi-annually. Fish and invertebrate samples are analyzed by gamma isotopic measurements.

f. Broad leaf vegetation samples are collected from three locations. Samples are collected and analyzed monthly. Broad leaf vegetation samples are analyzed by gamma isotopic measurements.

Attachment A provides specific information pertaining to sample locations, types and frequencies.

2. Analytical Responsibility:

Radiological environmental monitoring for the Turkey Point Plant is conducted by the State of Florida, Department of Health and Rehabilitative Services (HRS). Samples are collected and analyzed by HRS personnel. Samples are analyzed at the HRS Environmental Radiation Control Laboratory in Orlando, Florida.

C. Analytical Results: Table 1, Environmental Radiological Monitoring Program Annual Summary provides a summary for all specified samples collected during the referenced surveillance period. Deviations from the sample schedule, missing data and/or samples not meeting the specified "A PRIORI" LLD, if any, are noted and explained in Tables 1A and 1B respectively. Analysis data for all specified samples analyzed during the surveillance period is provided in Attachment B.

D. Land Use Census: A land use census out to a distance of 5 miles radius from the Turkey Point Plant is conducted annually to determine the location of the nearest milk animal, residence, and garden producing broad leaf vegetation in each of the sixteen meteorological sectors. A summary of the land use census for the surveillance year is provided in Table 2, Land Use Census Summary.

No locations yielding a calculated dose or dose commitment greater than the values currently being calculated were identified by the land use census.

No locations yielding a calculated dose or dose commitment (via the same exposure pathway) 20 % greater than locations currently being sampled in the radiological environmental monitoring program were identified by the land use census.

E. Interlaboratory Comparison Program: The State of Florida Environmental Radiation Control Laboratory participates in the Environmental Radioactivity Laboratory Intercomparison Studies Program conducted by the Environmental Protection Agency. Results from the Interlaboratory Comparison Program are provided in Attachment C.

III. DISCUSSION AND INTERPRETATION OF RESULTS

A. Reporting of Results: The Annual Radiological Environmental Operating Report contains the summaries, interpretations and information required by the Turkey Point Units 3 & 4 Technical Specifications. Table 1 provides a summary of the measurements made for the nuclides required by Technical Specifications, Table 4.12-2, for all samples specified by Table 4.12-1. In addition, summaries are provided for other nuclides identified in the specified samples, including those not related to station operation. These include nuclides such as ^{40}K, ^{232}Th, ^{226}Ra, ^{228}Ra, ^{7}Be, ^{235}U, ^{238}U, and ^{210}Pb which are common in the Florida environment.

B. Interpretation of Results

1. Direct Radiation: The results for direct radiation monitoring are consistent with past measurements for the specified locations. The exposure rate data shows no indication of any trends attributed to effluents from the plant. The measured exposure rates are consistent with exposure rates that were observed during the preoperational surveillance program. Direct radiation monitoring results are summarized in Table 1.

2. Air Particulates/Radioiodine: The results for radioactive airborne particulates and radioiodine were influenced by the passage of the plume resulting form the Chernobyl inicident. The annual average gross beta measurement is 40% higher than 1985. Twenty-Five out of 259 samples collected showed results in excess of ten times the historical average. These 25 samples were collected during the late May early June plume passage. Twelve of the 25 samples indicated radioiodine-131 in excess of MDA. The highest value, 0.47 pCi/m^3, was 52% of the reporting level identified in the Technical Specifications. Additionally, radiocesium 134 & 137 were detected by gamma spectroscopy at a maximum level of 0.04% & 0.037% of the Technical Specification Reporting Levels. Ruthenium-103 was also identified. Samples collected before and after the plume passage yielded results consistent with past measurements.

3. Surface Water: The results for radioactivity measurements in surface water samples are consistent with past measurements. Tritium was reported as present in 11 of 21 of the surface water samples collected from Site T-81. These results are consistent with the known subsurface interchange that occurs between the closed cooling canal and its surrounding waters, and the pressure gradients caused by the flow of aquifer subsurface waters in South Florida. The highest reported tritium (690 pCi/l) is less than 4% of the concentration of tritium that is permitted in community drinking water systems and less than 3% of the reporting value specified by Technical Specifications Table 4.12-2.

4. Waterborne Sediment and Food Products: The results for radioactivity measurements in waterborne sediment and fish samples are consistent with past measurements and (except for Cs-137) with measurements made during the preoperational surveillance program. Three fish samples, of four collected, had a positive Cs-137 value reported. The maximum value, is 31% of the table 4.12-3 LLD and is about 1% of the table 4.12-2 reporting levels. Although the reported concentration was very low, future samples will be closely evaluated to determine any trends which might be attributed to station operation. Results for the waterborne sediment, fish and crustacea samples are summarized in Table 1.

5. Broad Leaf Vegetation: The results for radioactivity measurements were also influenced by the passage of the plume resulting from the Chernobyl incident. Cs-137 results were consistent with past measurements. Cs-134 was identified in 3 out of 36 samples collected along with Ru-103 and I-131 found in 6 out of 36 samples collected. All of the samples showing positive Cs-134, Ru 103 and I-131 results were collected during the plume passage. The remaining samples collected yeilded results consistent with past measurements.

C. Conclusions

The data obtained through the Turkey Point Plant Radiological Environmental Monitoring Program verifies that the levels of radiation and concentrations of radioactive materials in environmental samples, representing the highest potential exposure pathways to members of the public, are not being increased. The measurements verify that the dose or dose commitment to members of the public, due to operation of Turkey Point Units Nos. 3 & 4, during the surveillance year, are well within "as low as reasonably achievable (ALARA)" criteria established by 10 CFR 50, Appendix I.

D. Notes

1) Maximum values attributed to the Chernobyl incident are comparable to levels associated with the Chinese weapons test of 1980 & 1978 but occurred over a shorter period of time.

2) Measurement attributed to Chernobyl were reported to the NRC pursuant to I & E notice 86-32.

BLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Unit Nos. 3 and 4 Docket No.(s) 50-250 and 50-251

Location of Facility Dade, Florida (County, State) Reporting Period January 1 - December 31, 1986

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name[c] Distance & Direction	Location with Highest Annual Mean Mean (f)[b] Range	Control Locations Mean (f)[b] Range	Number of Nonroutine Reported Measurements
DIRECT RADIATION							
TLD (micro-R/hr)	Exposure rate 83[d]	-	5.4 (83/83) 4.6 - 7.6	NW-10 10 miles; NW	7.4 (4/4) 7.1 - 7.4		0
AIRBORNE							
Radioiodines (pCi/m^3)	^{131}I 260	0.024	0.17 (12/260) 0.03-0.47	T-64 22 miles NNE	0.24 (2/52) 0.06-0.42	0.24 (2/52) 0.06-0.42	0 0
Air Particulates (pCi/m^3)	Gross Beta 259	0.0025	0.021 (259/259) 0.007-0.181	T-64 22 miles NNE	0.022 (52/52) 0.007-0.181	0.022 (52/52) 0.007-0.181	0
	Gamma Isotopic 20						
	^{7}Be	0.0052	0.109 (20/20) 0.091-0.129	T-64 22 mile, NNE	0.115 (4/4) 0.100-0.129	0.115 (4/4) 0.100-0.129	0
	^{103}Ru	-	0.0070 (5/20) 0.0062-0.0077	T-57 4 miles, NW	0.0077 (1/4)	0.0072 (1/4)	0
	^{134}Cs	0.00069	0.0035 (5/20) 0.0033-0.0042	T-64 22 miles, NNE	0.0042 (1/4)	0.0042 (1/4)	0
	^{137}Cs	0.00066	0.0069 (5/20) 0.0065-0.0075	T-64 22 miles, NNE	0.0075 (1/4)	0.0075 (1/4)	0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

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WATERBORNE							
Surface Water (pCi/l)	Tritium 45	230	376 (11/45) 140-690	T-81 6 miles, S	376 (11/21) 140-690	< MDA	0
	Gamma-Isotopic 45						
	^{40}K	60	298(45/45) 150-390	T-81 6 miles, S	311 (21/21) 230-390	275 (12/12) 150-330	0
	^{54}Mn	4	< MDA	-	-	< MDA	0
	^{59}Fe	8	< MDA	-	-	< MDA	0
	^{58}Co	4	< MDA	-	-	< MDA	0
	^{60}Co	4	< MDA	-	-	< MDA	0
	^{65}Zn	8	< MDA	-	-	< MDA	0
	^{95}Zr-Nb	7	< MDA	-	-	< MDA	0
	^{131}I	5	< MDA	-	-	< MDA	0
	^{134}Cs	5	< MDA	-	-	< MDA	0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

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Surface Water (pCi/l)	^{137}Cs	4	< MDA	-	-	< MDA	0
	^{140}Ba-La	11	< MDA	-	-	< MDA	0
WATERBORNE							
Sediment (pCi/kg,dry)	Gamma - Isotopic 6						
	^{40}K	140	495 (6/6) 280-770	T-67 13 -18 miles, N, NNE	750(2/2) 730-770	750(2/2) 730-770	0
	^{226}Ra	49	588 (6/6) 270-850	T-42 1 mile, ENE	780(2/2) 710-850	580(2/2) 550-610	0
	^{7}Be	71	220 (3/6) 140-320	T-81 6 mile, S	320 (1/2)	200 (1/3)	0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Unit Nos. 3 and 4 Docket No.(s) 50-250 and 50-251

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Sediment (pCi/kg, dry)	^{238}U	-	530(6/6) 190-1140	T-67 13-18 miles, N, NNE	760 (2/2) 380-1140	760 (2/2) 380-1140	0
	^{58}Co	9	< MDA	-	-	<MDA	0
	^{60}Co	12	< MDA	-	-	<MDA	0
	^{134}Cs	14	< MDA	-	-	<MDA	0
	^{137}Cs	12	< MDA	-	-	<MDA	0
	^{232}Th	52	47(4/6) 28-70	T-67 13-18 miles, N, NNE	70(1/2)	70(1/2)	0
	^{235}U	-	86(2/6) 68-103	T-67 13-18 miles, N,NNE	103(1/2)	103(1/2)	0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Unit Nos. 3 and 4 Docket No.(s) 50-250 and 50-251

Location of Facility Dade, Florida (County, State) Reporting Period January 1 - December 31, 1986

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range	Number of Nonroutine Reported Measurements
INGESTION							
Crustacea (pCi/kg,wet)	Gamma - Isotopic 4						
	^{40}K	130	1850 (4/4) 1600-2100	T-81 6 miles, S	1900 (2/2) 1700-2100	1800 (2/2) 1600-2000	0
	^{226}Ra	20	555 (4/4) 340-890	T-67 13-18 miles, S	615(2/2) 340-890	615(2/2) 340-890	0
	^{228}Ra	- -	150(2/4) 140-160	T-81 6 miles, S	160(1/2)	140(1/2)	0
	^{54}Mn	9	< MDA	-	-	< MDA	0
	^{59}Fe	16	< MDA	-	-	< MDA	0
	^{58}Co	9	< MDA	-	-	< MDA	0
	^{60}Co	10	< MDA	-	-	< MDA	0
	^{65}Zn	17	< MDA	-	-	< MDA	0
	^{134}Cs	9	< MDA	-	-	< MDA	0
	^{137}Cs	9	18 (1/5)	T-81 6 miles, S	18 (1/2)	< MDA	0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Unit Nos. 3 and 4 Docket No.(s) 50-250 and 50-251

Location of Facility Dade, Florida (County, State) Reporting Period January 1 - December 31, 1986

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range	Number of Nonroutine Reported Measurements
INGESTION							
Fish (pCi/kg,wet)	Gamma - Isotopic 4						
	^{40}K	130	2850 (4/4) 2700-3000	T-81 6 miles, S	2850 (2/2) 2800-2900	2850 (2/2) 2700-3000	0
	^{226}Ra	20	63 (3/4) 50-80	T-81 6 miles, S	70(2/2) 60-80	50(1/2)	0
	^{54}Mn	9	< MDA	-	-	< MDA	0
	^{59}Fe	16	< MDA	-	-	< MDA	0
	^{58}Co	9	< MDA	-	-	< MDA	0
	^{60}Co	10	< MDA	-	-	< MDA	0
	^{65}Zn	17	< MDA	-	-	< MDA	0
	^{134}Cs	9	< MDA	-	-	< MDA	0
	^{137}Cs	9	20(3/4) 13-25	T-81 6 miles, S	23(2/2) 21-25	13(1/2)	0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Unit Nos. 3 and 4 Docket No.(s) 50-250 and 50-251

Location of Facility Dade, Florida (County, State) Reporting Period January 1 - December 31, 1986

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range	Number of Nonroutine Reported Measurements
INGESTION							
Broad leaf vegetation (pCi/kg,wet)	Gamma - Isotopic 36						
	^{7}Be	71	1393 (36/36) 680-3000	T-40 3 miles, W	1634 (12/12) 700-3000	1329 (12/12) 680-2060	0
	^{40}K	100	2937 (36/36) 1700-5300	T-67 13-18 miles, N, NNE	3336 (12/12) 1930-5300	3336(12/12) 1930-5300	0
	^{103}Ru	-	20(6/36) 10-39	T-67 13-18 miles, N, NNE	27(2/12) 15-39	27(2/12) 15-39	0
	^{131}I	9	359(6/36) 67-675	T-40 3 miles, W	371(2/12) 67-675	341(2/12) 128-554	0
	^{134}Cs	8	17(3/36) 11-25	T-67 13-18 miles N, NNE	18(2/12) 11-25	18(2/12) 11-25	0
	^{137}Cs	8	161 (34/36) 15-452	T-40 3 miles, W	244 (12/12) 102-452	55 (10/12) 15-114	0

TABLE 1

NOTES

a. The LLD is an "a priori" lower limit of detection which establishes the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a real signal.

LLD's in this column are at time of measurement. The MDAs reported in attachment B for the individual samples have been corrected to the time of sample collection.

b. Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (f).

c. Specific identifying information for each sample location is provided in Attachment - A.

d. Results are based upon the average net response of two TLDs. (Thermoluminescent dosimeters).

MDA refers to minimum detectable activity

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT, UNIT NOS. 3 & 4

TABLE 1A

DEVIATIONS/MISSING DATA

Date	Location	Description of Problem	Deviation(s)	Corrective Action
03/17/86 to 06/09/86	NNW-10	TLD's missing at time of collection/replacement. Unauthorized removal during interval.	Direct exposure data for second quarter at this location, 10 miles NNW of plant, is unavailable.	Replaced TLD's with a new set.
05/27/86	T-72	Missing particulate filter due to installation error.	Failure to collect particulate sample at this location.	Review method with field personnel.
08/19/86	T-51	Circuit breaker on motor circuit tripped at about 118 hours into the 170 hour sampling period. Suspected cause is lightning.	Failure to provide continuous sampling during period.	Reset breaker upon discovery of fault.
09/16/86	T-64	Air pump failure at about 73 hours into the 193 hour period. Cause unknown.	Failure to provide continuous sampling during period.	Replaced failed unit upon discovery of fault.

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ST. LUCIE PLANT, UNIT NOS. 1 & 2

TABLE 1B

ANALYSES WITH LLDs ABOVE TABLE 4.12-1 DETECTION CAPABILITIES
1/1/86 - 12/31/86

Date	Sample Type	Location	Radionuclide	MDA	Table 4.12-1 LLD	Reason for Deviation

The values specified in Table 4.12-3, Detection Capabilities, were achieved for all samples.

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TURKEY POINT PLANT - UNITS NOS. 3 AND 4

TABLE 2

LAND USE CENSUS

DISTANCE TO NEAREST (a,b)

Sector	6/86 Milk (c) Animal	5/86 Residence	6/86 Garden (d)
N	L (e)	2.1/350 (g)	L
NNE	0 (f)	0	0
NE	0	0	0
ENE	0	0	0
E	0	0	0
ESE	0	0	0
[redacted]	0	0	0
[redacted]	0	0	0
S	L	L (g)	L
SSW	L	L	L
SW	L	L	L
WSW	L	L	L
W	L	L	L
WNW	L	1.6/303	3.9/303
NW	L	3.7/311	3.6/309
NNW	L	L (g)	4.5/328

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TURKEY POINT PLANT - UNITS NOS. 3 AND 4

TABLE 2 NOTES

LAND USE CENSUS

(a) All categories surveyed out to 5 miles radius from the Turkey Point Plant

(b) The following format is used to denote the location:

distance (miles)/bearing (degrees)

For example, a residence located in the north sector at a distance of 2.1 miles bearing 350 degrees is recorded as 2.1/350.

(c) Potential milk animal locations.

(d) Gardens with an estimated growing area of 500 square feet or more.

(e) L denotes that the sector area is predominently a land area unoccupied by the category type.

(f) 0 denotes that the sector area is predominently an ocean area.

(g) Non-residential occupied buildings in this sector include the following:

Sector	Distance	Description
N	1.8/349	24-hour Security Staffing building
S	4.9/171	Small building/boat dock-not considered a residence
NNW	4.5/327	2 mobile homes used for field offices
NNW	1.8/345	Security booth at park entrance.

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TURKEY POINT PLANT - UNITS NOS. 3 AND 4

ATTACHMENT A

KEY TO SAMPLE LOCATIONS

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
DIRECT RADIATION	N-1	Convoy Point	TLD	Quarterly	2	N
DIRECT RADIATION	N-5	North of Moody Dr.	TLD	Quarterly	6	N
DIRECT RADIATION	N-10	Old Cutler Rd. at S.W. 87th Ave.	TLD	Quarterly	12	N
DIRECT RADIATION	NNW-1	Turkey Point Entrance Road	TLD	Quarterly	<1	NNW
DIRECT RADIATION	NNW-10	Burr Rd. at Hainlin Mill Dr.	TLD	Quarterly	9	NNW
DIRECT RADIATION	NW/WNW-1	Turkey Point Entrance Road	TLD	Quarterly	1	WNW
DIRECT RADIATION	NW-5	Dolan's Farm on King's Highway	TLD	Quarterly	4	NNW
DIRECT RADIATION	NW-10	Intersection of Farm Life Rd. and Coconut Palm Dr.	TLD	Quarterly	10	NW

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
DIRECT RADIATION	W/WNW-5	Palm Drive at Tallahassee Rd.	TLD	Quarterly	5	W
DIRECT RADIATION	WNW-10.	Homestead near vehicle inspection station	TLD	Quarterly	9	WNW
DIRECT RADIATION	W-1	On site near cooling tower	TLD	Quarterly	1	W
DIRECT RADIATION	W-10	Florida City near fire tower	TLD	Quarterly	10	W
DIRECT RADIATION	WSW-10	Old Hawk missile site south of Florida City	TLD	Quarterly	12	WSW
DIRECT RADIATION	SW/SSW-1	On site near land utilizaiton offices	TLD	Quarterly	1	SSW
DIRECT RADIATION	SW-10	U.S. 1 south of Florida City	TLD	Quarterly	10	SW
DIRECT RADIATION	SSW/SW-5	On site, southeast corner of cooling canals	TLD	Quarterly	5	SSW

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
DIRECT RADIATION	SSW-10	At Card Sound Bridge	TLD	Quarterly	10	SSW
DIRECT RADIATION	S-5	On site, south end of cooling canals	TLD	Quarterly	5	S
DIRECT RADIATION	S-10	Card Sound Rd. at Steamboat Creek	TLD	Quarterly	10	S
DIRECT RADIATION	SSE/S-1	Turtle Point	TLD	Quarterly	1	SSE
DIRECT RADIATION	SSE-10	Ocean Reef	TLD	Quarterly	8	SSE
AIRBORNE	T51	Homestead Bayfront Park	Radioiodine and particulates	Weekly	2	NNW
AIRBORNE	T57	Tree Nursery 316th Street	Radioiodine and particulates	Weekly	4	NW
AIRBORNE	T58	Turkey Point Entrance Rd.	Radioiodine and particulates	Weekly	1	NW

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

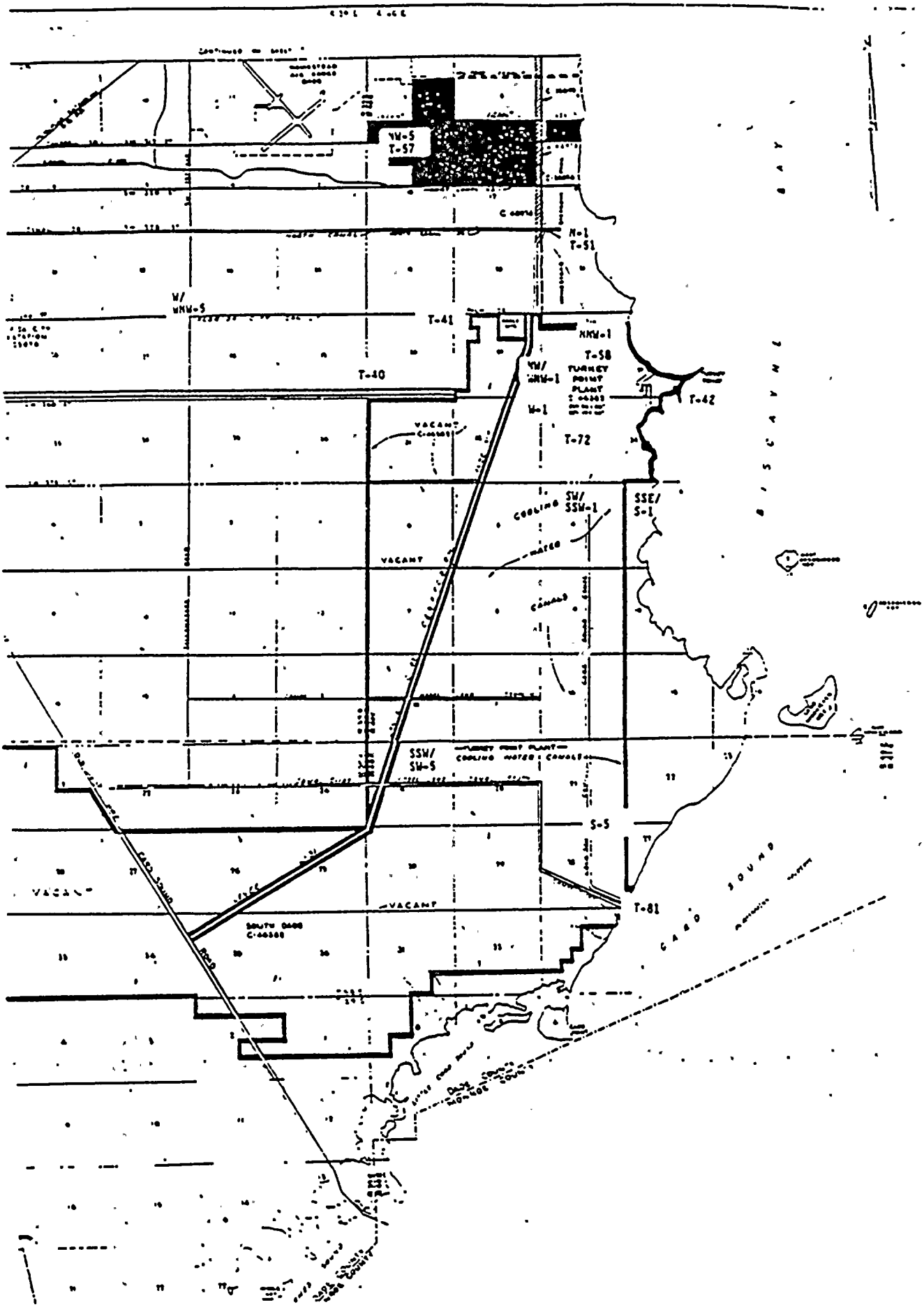
Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
AIRBORNE	T64*	Natoma Substation	Radioiodine and particulates	Weekly	22	NNE
AIRBORNE	T72	Turkey Point Boy Scout Camp	Radioiodine and particulates	Weekly	<1	WSW
WATERBORNE	T42	Biscayne Bay, at Turkey Point	Surface water Sediment from shoreline	Monthly Semi-annually	<1	ENE
WATERBORNE	T67*	Biscayne Bay, vicinity of Cutler Plant, north to Matheson Hammock Park	Surface water Sediment from shoreline	Monthly Semi-annually	13-18	N, NNE
WATERBORNE	T81	Card Sound, near mouth of old discharge canal	Surface water Sediment from shoreline	Monthly Semi-annually	6	S

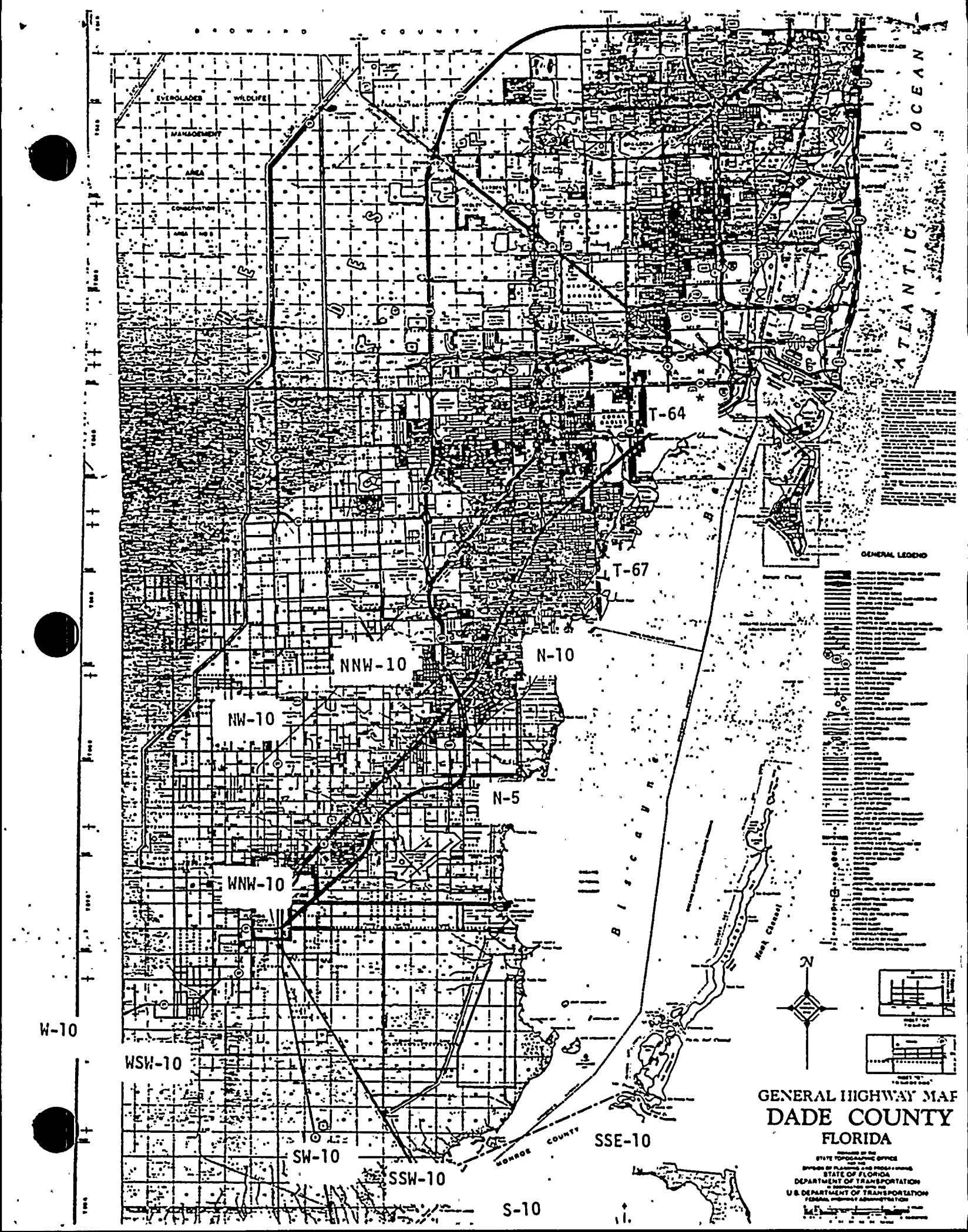
* Denotes control sample.

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
FOOD PRODUCTS	T67*	Biscayne Bay, vicinity of Cutler Plant north to Matheson Hammock Park	Crustacea	Semi-annually	13-18	N, NNE
			Fish	Semi-annually		
FOOD PRODUCTS	T81	Card Sound, vicinity of Turkey Point Facility	Crustacea	Semi-annually	6	S
			Fish	Semi-annually		
FOOD PRODUCTS	T40	South of Palm Dr. on SW 117th St. extension	Broad leaf vegetation	Monthly	3	W
FOOD PRODUCTS	T41	Palm Dr. West of old missile site near the site boundary	Broad leaf vegetation	Monthly	2	WNW
FOOD PRODUCTS	T67	Near Biscayne Bay, vicinity of Cutler Plant north to Matheson Hammock Park	Broad leaf vegetation	Monthly	13-18	N, NNE

* Denotes Control Sample.


W/
WNW-5
T-41
T-40
NNW-1
T-58
TURKEY
POINT
PLANT
T-42
N-1
T-51
T-72
SW/
SSW-1
SSE/
S-1
VACANT
SSW/
SW-5
S-5
T-81
VACANT
VACANT
BISCAYNE
BAY
CAPE SOUND


T-64
T-67
N-10
NNW-10
NW-10
N-5
WNW-10
W-10
WSW-10
SW-10
SSW-10
S-10
SSE-10
ATLANTIC OCEAN
Biscayne Bay
MONROE COUNTY
GENERAL LEGEND
N
GENERAL HIGHWAY MAP
DADE COUNTY
FLORIDA
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
U.S. DEPARTMENT OF TRANSPORTATION

1986
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
ST. LUCIE PLANT - UNITS NOS. 3 AND 4

ATTACHMENT B

RADIOLOGICAL SURVEILLANCE OF
FLORIDA POWER AND LIGHT COMPANY'S

ST. LUCIE SITE

1986

First Quarter,1986
Second Quarter, 1986
Third Quarter,1986
Fourth Quarter,1986

RADIOLOGICAL SURVEILLANCE OF FLORIDA POWER AND LIGHT COMPANY'S TURKEY POINT SITE

First Quarter, 1986

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

First Quarter, 1986

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	60
2.b Air Particulates	Weekly	5	64*
3. Waterborne			
3.a Surface Water	Monthly	3	9
3.b Shoreline Sediment	Semiannually	3	3
4. Ingestion			
4.a Fish and Invertebrates			
4.a.1 Crustacea	Semiannually	2	2
4.a.2 Fish	Semiannually	2	2
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	9
			Total: 191

* - Includes DOE split samples.

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term.

Measurement results that are <u>not</u> significantly above background are reported as "non-detectable" (ND) or as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

TURKEY POINT TECHNICAL SPECIFICATIONS SAMPLING

FIRST QUARTER, 1986

1. DIRECT RADIATION - TLDs - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployed 12-09-85 Collected 3-17-86
N-1	4.6 ± 0.2
N-5	5.6 ± 0.3
N-10	5.2 ± 0.3
NNW-1	5.8 ± 0.3
NNW-10	6.3 ± 0.3
NW/WNW-1	5.0 ± 0.3
NW-5	5.2 ± 0.3
NW-10	7.1 ± 0.4
W/WNW-5	4.7 ± 0.2
WNW-10	5.8 ± 0.3
W-1	5.0 ± 0.3
W-10	6.5 ± 0.3
WSW-10	4.6 ± 0.2
SW/SSW-1	4.8 ± 0.3
SW-10	5.0 ± 0.3
SSW/SW-5	5.0 ± 0.3
SSW-10	5.3 ± 0.3
S-5	4.8 ± 0.3
S-10	5.5 ± 0.3
SSE/S-1	4.8 ± 0.3
SSE-10	4.6 ± 0.2

NOTES:

1. The error terms reported above are based on an empirical statistical analysis of the differences in the results from the individual dosimeters at each site. As such, these error terms are representative of the typical error for such measurements rather than accurately representing the error terms for individual measurements.

2. These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been done.

3. Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.

1. DIRECT RADIATION - TLDs - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployed 12-09-85 Collected 3-17-86
N-1	Due to failure of the TLD reader normally used, these dosimeters were read out on a new instrument. Final results for these readings cannot be determined until the behavior of these dosimeters (i.e., net response, self-exposure rate, and fading) can be determined on this new instrument. This could not be completed for this report. This data will be included as an addendum to a future report.
N-5	
N-10	
NNW-1	
NNW-10	
NW/WNW-1	
NW-5	
NW-10	
W/WNW-5	
WNW-10	
W-1	
W-10	
WSW-10	
SW/SSW-1	
SW-10	
SSW/SW-5	
SSW-10	
S-5	
S-10	
SSE/S-1	
SSE-10	

2.a IODINE-131 IN WEEKLY AIR FILTERS - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
1-07-86	<0.02	<0.02	<0.02	<0.02	<0.02
1-14-86	<0.02	<0.02	<0.02	<0.02	<0.02
1-21-86	<0.04	<0.04	<0.04	<0.04	<0.04
1-28-86	<0.06	<0.06	<0.06	<0.05	<0.06
2-04-86	<0.03	<0.03	<0.03	<0.03	<0.03
2-11-86	<0.04	<0.04	<0.03	<0.04	<0.03
2-18-86	<0.03	<0.03	<0.03	<0.03	<0.03
2-25-86	<0.03	<0.03	<0.03	<0.03	<0.03
3-04-86	<0.05	<0.05	<0.05	<0.05	<0.05
3-11-86	<0.03	<0.03	<0.03	<0.03	<0.03
3-18-86	<0.03	<0.03	<0.03	<0.03	<0.03
3-25-86	<0.03	<0.03	<0.03	<0.03	<0.03

2.b AIR PARTICULATES - GROSS BETA - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
1-07-86	0.018 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.018 ± 0.002	0.010 ± 0.001
1-14-86	0.010 ± 0.002	0.010 ± 0.002	0.014 ± 0.002	0.011 ± 0.002	0.008 ± 0.001
1-21-86	0.013 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.013 ± 0.002
1-28-86	0.014 ± 0.002	0.015 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.018 ± 0.002
2-04-86	0.016 ± 0.002	0.015 ± 0.002	*0.018 ± 0.002	0.018 ± 0.002	0.016 ± 0.002
2-11-86	0.012 ± 0.002	0.013 ± 0.002	*0.010 ± 0.001	0.011 ± 0.002	0.011 ± 0.002
2-18-86	0.021 ± 0.002	0.020 ± 0.002	*0.018 ± 0.002	0.017 ± 0.002	0.015 ± 0.002
2-25-86	0.012 ± 0.002	0.009 ± 0.001	*0.015 ± 0.002	0.013 ± 0.002	0.014 ± 0.002
3-04-86	0.015 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.016 ± 0.002	0.015 ± 0.002
3-11-86	0.010 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.011 ± 0.002
3-18-86	0.010 ± 0.002	0.010 ± 0.001	0.007 ± 0.001	0.007 ± 0.001	0.007 ± 0.001
3-25-86	0.009 ± 0.001	0.014 ± 0.002	0.010 ± 0.001	0.012 ± 0.002	0.011 ± 0.002
Means:	0.013 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.012 ± 0.001

* - DOE split samples.

2.b AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m^3)

First Quarter, 1986

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
T51	0.108 ± 0.008	<0.026	<0.0008	<0.0009	<0.037
T57	0.126 ± 0.010	<0.027	<0.0009	<0.0008	<0.045
T58	0.124 ± 0.011	<0.015	<0.0009	<0.0008	<0.040
T64	0.129 ± 0.010	<0.029	<0.0008	<0.0009	0.044 ± 0.016
T72	0.106 ± 0.010	<0.016	<0.0008	<0.0009	<0.044

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	1-14-86	<190	260 ± 40	<4	<9	<4	<4	<7	<6	<4	<5	<4	<7
	2-10-86	<190	240 ± 40	<5	<13	<6	<6	<12	<8	<9	<4	<5	<7
	3-17-86	<200	340 ± 50	<4	<11	<4	<5	<9	<8	<7	<4	<4	<5
T67	1-14-86	<190	220 ± 40	<4	<11	<4	<5	<10	<5	<5	<3	<4	<6
	2-10-86	<190	150 ± 40	<5	<11	<5	<6	<10	<8	<9	<5	<4	<6
	3-17-86	<190	320 ± 50	<4	<11	<5	<2	<9	<9	<8	<4	<4	<6
T81	1-14-86	250 ± 60	250 ± 50	<5	<10	<4	<5	<11	<9	<6	<4	<4	<6
	2-10-86	380 ± 60	360 ± 40	<4	<10	<5	<5	<9	<8	<10	<5	<5	<6
	3-17-86	320 ± 60	320 ± 50	<4	<10	<5	<5	<10	<8	<8	<5	<4	<7

(A) These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLDs.

(B) These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

3.b SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Ra-226	Th-232	U-238	U-235
T42	1-21-86	<140	280 ± 70	<11	<10	<12	<10	710 ± 20	55 ± 9	440 ± 20	<170
T67	1-21-86	<140	730 ± 90	<13	<14	<12	<13	610 ± 60	<33	1140 ± 120	103 ± 8
T81	1-16-86	<120	300 ± 60	<11	<11	<9	<10	540 ± 30	<23	330 ± 30	<150

4.a.1 CRUSTACEA - Blue Crab - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226
T67	3-06-86	2000 ± 100	<12	<31	<15	<10	<26	<15	<12	340 ± 20
T81	3-11-86	2100 ± 100	<12	<33	<13	<14	<31	<15	<12	490 ± 40

4.a.2 FISH - Mixed Species (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226
T67	3-06-86	2700 ± 200	<13	<40	<13	<14	<33	<14	<13	50 ± 10
T81	2-05-86	2800 ± 100	<12	<35	<12	<14	<28	<12	21 ± 6	80 ± 10

4.b.1 BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
T40	1-14-86	3000 ± 80	1750 ± 90	<8	<7	145 ± 7
	2-10-86	1410 ± 70	2300 ± 100	<15	<8	249 ± 9
	3-17-86	1540 ± 60	2900 ± 100	<12	<7	132 ± 7
T41	1-14-86	1130 ± 60	2900 ± 100	<7	<8	72 ± 6
	2-10-86	1160 ± 60	3100 ± 100	<15	<10	85 ± 7
	3-17-86	1310 ± 60	1960 ± 90	<10	<6	108 ± 6
T67	1-14-86	2010 ± 70	2400 ± 100	<8	<6	55 ± 5
	2-10-86	980 ± 60	3800 ± 100	<13	<10	15 ± 4
	3-17-86	1020 ± 60	3800 ± 100	<15	<8	30 ± 5

RADIOLOGICAL SURVEILLANCE OF FLORIDA POWER AND LIGHT COMPANY'S TURKEY POINT SITE

Second Quarter, 1986

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

Second Quarter, 1986

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	21	40
2. Airborne			
2.a Air Iodines	Weekly	5	70
2.b Air Particulates	Weekly	5	73*
3. Waterborne			
3.a Surface Water	Monthly	3	12
3.b Shoreline Sediment	Semiannually	0	0
4. Ingestion			
4.a Fish and Invertebrates			
4.a.1 Crustacea	Semiannually	0	0
4.a.2 Fish	Semiannually	0	0
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	10*
			Total: 205

* - Includes DOE split samples.

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term.

Measurement results that are not significantly above background are reported as "non-detectable" (ND) or as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

TURKEY POINT TECHNICAL SPECIFICATIONS SAMPLING

SECOND QUARTER, 1986

1. DIRECT RADIATION - TLDs - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployed 3-17-86 Collected 6-09-86
N-1	4.9 ± 0.3
N-5	5.5 ± 0.3
N-10	5.1 ± 0.3
NNW-1	6.0 ± 0.3
NNW-10	Note 4
NW/WNW-1	5.3 ± 0.3
NW-5	5.2 ± 0.3
NW-10	7.3 ± 0.4
W/WNW-5	4.9 ± 0.3
WNW-10	6.3 ± 0.3
W-1	5.2 ± 0.3
W-10	6.2 ± 0.3
WSW-10	4.8 ± 0.3
SW/SSW-1	4.8 ± 0.3
SW-10	5.2 ± 0.3
SSW/SW-5	4.9 ± 0.3
SSW-10	5.4 ± 0.3
S-5	4.7 ± 0.2
S-10	5.8 ± 0.3
SSE/S-1	4.6 ± 0.2
SSE-10	4.8 ± 0.3

NOTES:

1. The error terms reported above are based on an empirical statistical analysis of the differences in the results from the individual dosimeters at each site. As such, these error terms are representative of the typical error for such measurements rather than accurately representing the error terms for individual measurements.

2. These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been done.

3. Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.

4. The Dosimeters from site NNW-10 were missing when collection was attempted.

1. DIRECT RADIATION - TLDs - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployed 3-17-86 Collected 6-09-86
N-1	Due to failure of the TLD reader normally used, these dosimeters were read out on a new instrument. Final results for these readings cannot be determined until the behavior of these dosimeters (i.e., net response, self-exposure rate, and fading) can be determined on this new instrument. This could not be completed for this report. This data will be included as an addendum to a future report.
N-5	
N-10	
NNW-1	
NNW-10 (A)	
NW/WNW-1	
NW-5	
NW-10	
W/WNW-5	
WNW-10	
W-1	
W-10	
WSW-10	
SW/SSW-1	
SW-10	
SSW/SW-5	
SSW-10	
S-5 (B)	
S-10	
SSE/S-1	
SSE-10	

A - The dosimeters for site NNW-10 were missing when collection was attempted.

B - The dosimeters for site S-5 and their holder were found on the ground upon collection.

2.a IODINE-131 IN WEEKLY AIR FILTERS - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
4-01-86	<0.04	<0.04	<0.04	<0.04	<0.04
4-08-86	<0.06(A)	<0.04	<0.04	<0.04	<0.04
4-15-86	<0.03	<0.03	<0.03	<0.03	<0.03
4-23-86	<0.04	<0.04	<0.04	<0.04	<0.04
4-29-86	<0.03	<0.03	<0.03	<0.03	<0.04
5-06-86	<0.03	<0.04	<0.03	<0.03	<0.03
5-13-86	0.47 ± 0.04	0.17 ± 0.01	0.21 ± 0.01	0.42 ± 0.04	0.22 ± 0.01
5-19-86	0.11 ± 0.01	0.06 ± 0.01	0.09 ± 0.01	0.06 ± 0.01	0.12 ± 0.01
5-27-86	0.03 ± 0.01	<0.03	<0.03	<0.05	0.04 ± 0.01
6-03-86	<0.03	<0.03	<0.03	<0.03	<0.03
6-10-86	<0.05	<0.05	<0.04	<0.04	<0.04
6-16-86	<0.04	<0.04	<0.04	<0.04	<0.04
6-24-86	<0.02	<0.02	<0.02	<0.02	<0.02
6-30-86	<0.05	<0.05	<0.05	<0.05	<0.05

A - This sample had a low volume due to a low flowrate setting.

NOTE: Detectable concentrations of I-131 in these samples are attributed to releases from the 4-26-86 disaster at the nuclear facility at Chernobyl, U.S.S.R.

2.b AIR PARTICULATES - GROSS BETA - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
4-01-86	0.009 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.014 ± 0.002	0.012 ± 0.002
4-08-86	(A0.015 ± 0.002	0.023 ± 0.002	0.023 ± 0.002	0.018 ± 0.002	0.020 ± 0.002
4-15-86	0.016 ± 0.002	0.017 ± 0.002	0.017 ± 0.002	0.020 ± 0.002	0.017 ± 0.002
4-23-86	0.013 ± 0.002	0.015 ± 0.002	0.011 ± 0.001	0.014 ± 0.002	0.015 ± 0.002
4-29-86	0.020 ± 0.002	0.027 ± 0.002	0.023 ± 0.002	0.022 ± 0.002	0.022 ± 0.002
5-06-86	0.017 ± 0.002	0.025 ± 0.002	*0.024 ± 0.002	0.022 ± 0.002	0.025 ± 0.002
5-13-86	0.157 ± 0.005	0.170 ± 0.005	*0.148 ± 0.005	0.181 ± 0.006	0.157 ± 0.005
5-19-86	0.077 ± 0.004	0.061 ± 0.004	*0.053 ± 0.003	0.075 ± 0.004	0.071 ± 0.004
5-27-86	0.070 ± 0.003	0.090 ± 0.004	*0.067 ± 0.003	0.074 ± 0.003	(B)
6-03-86	0.068 ± 0.004	0.066 ± 0.003	0.054 ± 0.003	0.061 ± 0.003	0.072 ± 0.004
6-10-86	0.030 ± 0.002	0.030 ± 0.002	0.031 ± 0.002	0.036 ± 0.003	0.029 ± 0.002
6-16-86	0.013 ± 0.002	0.014 ± 0.002	0.011 ± 0.002	0.016 ± 0.002	0.019 ± 0.002
6-24-86	0.009 ± 0.001	0.012 ± 0.002	0.008 ± 0.001	0.010 ± 0.001	0.009 ± 0.001
6-30-86	0.034 ± 0.003	0.018 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.022 ± 0.002
Means:	0.039 ± 0.001	0.041 ± 0.001	0.036 ± 0.001	0.042 ± 0.001	0.038 ± 0.001

* - DOE split samples.

(A) - This sample had a low volume due to a low flowrate setting.

(B) - There was no particulate filter upon collection due to a procedural error - the operator failed to install one upon collection of the previous sample.

NOTE: Elevated radioactivity levels in the samples collected on or after 4-29-86 are attributed to releases from the 4-26-86 disaster at the nuclear facility at Chernobyl, U.S.S.R.

2.b AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m^3)

Second Quarter, 1986

Sample Site	Be-7	K-40	Ru-103	Cs-134	Cs-137	Pb-210
T51	0.110 ± 0.008	<0.022	0.0076 ± 0.0010	0.0036 ± 0.0003	0.0065 ± 0.0006	0.03 + 0.01
T57	0.110 ± 0.009	<0.022	0.0077 ± 0.0010	0.0033 ± 0.0003	0.0069 ± 0.0006	<0.03
T58	0.110 ± 0.008	<0.021	0.0062 ± 0.0011	0.0033 ± 0.0003	0.0070 ± 0.0006	<0.03
T64	0.124 ± 0.008	<0.024	0.0072 ± 0.0011	0.0042 ± 0.0004	0.0075 ± 0.0006	<0.03
T72	0.124 ± 0.009	<0.025	0.0062 ± 0.0011	0.0033 ± 0.0003	0.0068 ± 0.0005	<0.07

NOTE: Detectable concentrations of Ru-103, Cs-134, and Cs-137 in these samples are attributed to releases from the 4-26-86 disaster at the nuclear facility at Chernobyl, U.S.S.R.

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	4-14-86	<180	340 ± 40	<3	<8	<3	<3	<9	<7	<11	<5	<4	<7
	5-12-86	<190	300 ± 50	<4	<10	<4	<5	<9	<8	<7	<5	<5	<4
	6-09-86	<190	380 ± 50	<4	<12	<4	<4	<11	<7	<8	<5	<5	<8
T67	4-14-86	<180	320 ± 40	<4	<11	<4	<5	<11	<8	<11	<4	<5	<5
	5-12-86	<190	330 ± 50	<4	<11	<5	<5	<10	<8	<7	<5	<5	<6
	6-09-86	<190	270 ± 50	<4	<12	<4	<4	<11	<6	<11	<5	<5	<7
T81	4-14-86(C)	<180	380 ± 50	<4	<10	<5	<5	<11	<9	<12	<5	<4	<8
	4-14-86(D)	<210	230 ± 50	<4	<11	<4	<5	<10	<7	<12	<5	<4	<9
	5-12-86(C)	<190	330 ± 50	<3	<11	<4	<4	<9	<8	<9	<6	<5	<6
	5-12-86(D)	390 ± 60	390 ± 50	<4	<9	<4	<5	<12	<8	<7	<4	<4	<5
	6-09-86(C)	<190	330 ± 50	<4	<13	<4	<5	<11	<8	<11	<4	<5	<7
	6-09-86(D)	<190	260 ± 50	<4	<13	<4	<5	<12	<8	<11	<5	<5	<7

(A) These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLDs.

(B) These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

(C) Collected at the normal location - in the old discharge canal about 200' west of the mouth.

(D) Collected at a comparison location - at the mouth of the old discharge canal on the south side of the prominent embankment in this area.

4.b.1 BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	Ru-103	I-131	Cs-134	Cs-137
T40	4-14-86	1860 ± 80	3900 ± 100	<11	<34	<8	332 ± 10
	5-12-86	700 ± 50	2000 ± 100	<10	675 ± 19	<10	140 ± 7
	*6-10-86	1150 ± 70	2600 ± 100	26 ± 4	67 ± 14	<10	372 ± 11
T41	4-14-86	1100 ± 60	2500 ± 100	<8	<30	<7	95 ± 6
	5-12-86	870 ± 60	1700 ± 100	<12	655 ± 19	<10	212 ± 9
	6-10-86	760 ± 60	2700 ± 100	18 ± 5	75 ± 12	<10	215 ± 8
T67	4-14-86	1730 ± 70	3400 ± 100	<9	<27	<8	71 ± 6
	5-12-86	1020 ± 60	2200 ± 100	<9	554 ± 18	<9	36 ± 4
	6-09-86	1480 ± 60	2400 ± 100	39 ± 5	128 ± 11	25 ± 3	53 ± 6

* - DOE Split Sample.

NOTE: Detectable concentrations of Ru-103, I-131, and Cs-134 in these samples are attributed to releases from the 4-26-86 disaster at the nuclear facility at Chernobyl, U.S.S.R. Some of the Cs-137 may also be attributable to residual activity from the testing of nuclear weapons.

RADIOLOGICAL SURVEILLANCE OF FLORIDA POWER AND LIGHT COMPANY'S TURKEY POINT SITE

Third Quarter, 1986

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

Third Quarter, 1986

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
3. Waterborne			
3.a Surface Water	Monthly	3	12
3.b Shoreline Sediment	Semiannually	3	3
4. Ingestion			
4.a Fish and Invertebrates			
4.a.1 Crustacea	Semiannually	2	2
4.a.2 Fish	Semiannually	2	2
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	9
			Total: 204

* - Includes DOE split samples.

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term.

Measurement results that are <u>not</u> significantly above background are reported as "non-detectable" (ND) or as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

TURKEY POINT TECHNICAL SPECIFICATIONS SAMPLING

THIRD QUARTER, 1986

1. DIRECT RADIATION - TLDs - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployed 6-09-86 Collected 9-23-86
N-1	4.9 ± 0.3
N-5	5.9 ± 0.3
N-10	5.4 ± 0.3
NNW-1	5.7 ± 0.3
NNW-10	6.1 ± 0.3
NW/WNW-1	5.0 ± 0.3
NW-5	5.5 ± 0.3
NW-10	7.6 ± 0.4
W/WNW-5	4.9 ± 0.3
WNW-10	6.5 ± 0.3
W-1	5.5 ± 0.3
W-10	6.5 ± 0.3
WSW-10	4.7 ± 0.2
SW/SSW-1	5.4 ± 0.3
SW-10	5.2 ± 0.3
SSW/SW-5	5.4 ± 0.3
SSW-10	5.5 ± 0.3
S-5	4.8 ± 0.3
S-10	5.6 ± 0.3
SSE/S-1	4.8 ± 0.3
SSE-10	4.7 ± 0.2

NOTES:

1. The error terms reported above are based on an empirical statistical analysis of the differences in the results from the individual dosimeters at each site. As such, these error terms are representative of the typical error for such measurements rather than accurately representing the error terms for individual measurements.

2. These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been done.

3. Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.

1. DIRECT RADIATION - TLDs - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployed 6-09-86 Collected 9-23-86
N-1	Due to failure of the TLD reader normally used, these dosimeters were read out on a new instrument. Final results for these readings cannot be determined until the behavior of these dosimeters (i.e., net response, self-exposure rate, and fading) can be determined on this new instrument. This could not be completed for this report. This data will be included as an addendum to a future report.
N-5	
N-10	
NNW-1	
NNW-10	
NW/WNW-1	
NW-5	
NW-10	
W/WNW-5	
WNW-10	
W-1	
W-10	
WSW-10	
SW/SSW-1	
SW-10	
SSW/SW-5	
SSW-10	
S-5	
S-10	
SSE/S-1	
SSE-10	

2.a IODINE-131 IN WEEKLY AIR FILTERS - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
7-08-86	<0.02	<0.02	<0.02	<0.02	<0.02
7-15-86	<0.03	<0.03	<0.03	<0.03	<0.03
7-22-86	<0.03	<0.03	<0.03	<0.03	<0.03
7-29-86	<0.03	<0.03	<0.03	<0.03	<0.03
8-05-86	<0.03	<0.03	<0.03	<0.03	<0.02
8-12-86	<0.02	<0.02	<0.02	<0.03	<0.02
8-19-86	<0.05(A)	<0.04	<0.03	<0.03	<0.03
8-25-86	<0.04	<0.04	<0.03	<0.04	<0.04
9-02-86	<0.02	<0.02	<0.02	<0.02	<0.03
9-08-86	<0.03	<0.03	<0.03	<0.03	<0.03
9-16-86	<0.02	<0.02	<0.02	<0.06(B)	<0.02
9-23-86	<0.02	<0.02	<0.02	<0.02	<0.02
9-30-86	<0.03	<0.03	<0.03	<0.03	<0.02

(A) - A circuit breaker had tripped at this location during this sample, possibly due to lightning. The equipment is estimated to have run for 118 hours out of the 170 total hours for this sample interval.

(B) - The air pump had failed at this location. The equipment is estimated to have run for 73 hours out of the 193 total hours for this sample interval.

2.b AIR PARTICULATES - GROSS BETA - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
7-08-86	0.017 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.021 ± 0.002	0.019 ± 0.002
7-15-86	0.017 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.017 ± 0.002
7-22-86	0.017 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.016 ± 0.002	0.020 ± 0.002
7-29-86	0.017 ± 0.002	0.016 ± 0.002	0.017 ± 0.002	0.020 ± 0.002	0.015 ± 0.002
8-05-86	0.014 ± 0.002	0.014 ± 0.002	*0.016 ± 0.002	0.014 ± 0.002	0.011 ± 0.002
8-12-86	0.009 ± 0.001	0.013 ± 0.002	*0.012 ± 0.002	0.010 ± 0.002	0.009 ± 0.001
8-19-86	(A0.016 ± 0.002	0.013 ± 0.002	*0.012 ± 0.002	0.011 ± 0.002	0.017 ± 0.002
8-25-86	0.022 ± 0.002	0.016 ± 0.002	*0.022 ± 0.002	0.020 ± 0.002	0.028 ± 0.003
9-02-86	0.016 ± 0.002	0.013 ± 0.002	0.015 ± 0.002	0.012 ± 0.002	0.019 ± 0.002
9-08-86	0.014 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.010 ± 0.002	0.014 ± 0.002
9-16-86	0.019 ± 0.002	0.022 ± 0.002	0.018 ± 0.002	(B0.029 ± 0.004	0.025 ± 0.002
9-23-86	0.012 ± 0.002	0.014 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.013 ± 0.002
9-30-86	0.016 ± 0.002	0.014 ± 0.002	0.010 ± 0.002	0.012 ± 0.002	0.017 ± 0.002
Means:	0.016 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.017 ± 0.001

* - DOE split samples.

(A) - A circuit breaker had tripped at this location during this sample, probably due to lightning. The equipment is estimated to have run for 118 hours out of the 170 total hours for this sample interval.

(B) - The air pump had failed at this location. The equipment is estimated to have run for 73 hours out of the 193 total hours for this sample interval.

2.b AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m^3)

Third Quarter, 1986

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
T51	0.098 ± 0.007	<0.023	<0.0007	<0.0009	<0.034
T57	0.092 ± 0.008	<0.013	<0.0009	<0.0009	<0.030
T58	0.091 ± 0.008	<0.016	<0.0009	<0.0008	<0.035
T64	0.100 ± 0.009	<0.024	<0.0008	<0.0008	<0.035
T72	0.111 ± 0.008	<0.023	<0.0009	<0.0008	<0.033

3.a SURFACE WATER - (pCi/1)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	7-17-86	<210	240 ± 50	<4	<10	<4	<5	<9	<8	<5	<5	<5	<6
	8-11-86	<210	360 ± 50	<5	<9	<4	<5	<9	<9	<5	<6	<5	<4
	9-10-86	<210	340 ± 50	<4	<9	<4	<4	<11	<7	<5	<5	<5	<7
T67	7-17-86	<210	260 ± 50	<4	<10	<4	<5	<9	<8	<6	<4	<5	<4
	8-12-86	<210	260 ± 50	<5	<10	<5	<5	<11	<8	<7	<4	<4	<5
	9-10-86	<210	260 ± 50	<4	<9	<4	<5	<11	<8	<6	<5	<5	<8
T81	7-17-86(C)	350 ± 60	250 ± 50	<5	<11	<4	<4	<12	<8	<6	<6	<5	<8
	7-17-86(D)	340 ± 60	240 ± 50	<5	<10	<4	<5	<10	<8	<6	<5	<5	<6
	8-11-86(C)	560 ± 70	290 ± 50	<3	<11	<4	<5	<11	<9	<8	<5	<5	<5
	8-11-86(D)	690 ± 70	310 ± 50	<4	<12	<4	<4	<12	<8	<7	<5	<5	<8
	9-10-86(C)	<210	300 ± 50	<5	<8	<4	<5	<11	<7	<5	<5	<4	<10
	9-10-86(D)	<210	330 ± 50	<4	<8	<3	<5	<8	<8	<4	<5	<4	<8

(A) These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLDs.

(B) These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

(C) Collected at the normal location - in the old discharge canal about 200' west of the mouth.

(D) Collected at a comparison location - at the mouth of the old discharge canal on the south side of the prominent embankment in this area.

3.b SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Mn-54	Co-58	Co-60	Cs-134	Cs-137	Others
T42	7-17-86	140 ± 40	420 ± 70	<13	<15	<14	<14	<14	Ra-226: 850 ± 20 Th-232: 33 ± 7 U-235: 68 ± 7 U-238: 700 ± 100
T67	7-17-86	200 ± 60	770 ± 90	<11	<12	<14	<14	<12	Ra-226: 550 ± 30 Th-232: 70 ± 30 U-238: 380 ± 90
T81	7-17-86	320 ± 60	470 ± 70	<11	<11	<9	<11	<10	Ra-226: 270 ± 20 Th-232: 28 ± 7 U-238: 190 ± 60

4.a.1 CRUSTACEA - Blue Crab - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Others
T67	9-10-86	1600 ± 100	<13	<36	<13	<16	<33	<17	<15	Ra-226: 890 ± 30 Ra-228: 140 ± 30
T81	7-31-86	1700 ± 200	<14	<39	<15	<14	<39	<16	<18	Ra-226: 500 ± 20 Ra-228: 160 ± 30

4.a.2 FISH - Mixed Species - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Others
T67	9-08-86	3000 ± 200	<10	<46	<15	<13	<32	<13	13 ± 5	Ra-226: <220 Ra-228: <60
T81	8-06-86	2900 ± 200	<14	<38	<12	<15	<33	<15	25 ± 5	Ra-226: 60 ± 10 Ra-228: <60

4.b.1 BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	Ru-103	I-131	Cs-134	Cs-137
T40	7-17-86	1570 ± 70	2900 ± 100	11 ± 4	<13	<11	204 ± 9
	8-12-86	1620 ± 70	2500 ± 100	<10	<16	<10	386 ± 11
	9-10-86	2320 ± 80	2900 ± 100	<10	<16	<10	102 ± 6
T41	7-17-86	1730 ± 60	3100 ± 100	10 ± 4	<11	14 ± 6	108 ± 7
	8-12-86	1480 ± 70	2800 ± 100	<10	<14	<10	147 ± 8
	9-10-86	1520 ± 70	3800 ± 100	<10	<16	<11	425 ± 11
T67	7-17-86	2060 ± 80	4100 ± 100	15 ± 4	<13	11 ± 2	114 ± 7
	8-12-86	680 ± 50	5300 ± 200	<10	<13	<11	28 ± 5
	9-10-86	1480 ± 70	2800 ± 100	<9	<16	<9	88 ± 7

RADIOLOGICAL SURVEILLANCE OF FLORIDA POWER AND LIGHT COMPANY'S TURKEY POINT SITE

Fourth Quarter, 1986

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

Fourth Quarter, 1986

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
3. Waterborne			
3.a Surface Water	Monthly	3	12
3.b Shoreline Sediment	Semiannually	0	0
4. Ingestion			
4.a Fish and Invertebrates			
4.a.1 Crustacea	Semiannually	0	0
4.a.2 Fish	Semiannually	0	0
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	10*
			Total: 198

* - Includes DOE split samples.

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term.

Measurement results that are not significantly above background are reported as "non-detectable" (ND) or as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

TURKEY POINT TECHNICAL SPECIFICATIONS SAMPLING

FOURTH QUARTER, 1986

1. DIRECT RADIATION - TLDs - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployment 9-22-86 Collection 12-15-86
N-1	4.9 ± 0.3
N-5	5.6 ± 0.3
N-10	5.0 ± 0.3
NNW-1	5.7 ± 0.3
NNW-10	5.9 ± 0.3
NW/WNW-1	4.9 ± 0.3
NW-5	5.2 ± 0.3
NW-10	7.4 ± 0.4
W/WNW-5	4.7 ± 0.2
WNW-10	6.6 ± 0.3
W-1	5.1 ± 0.3
W-10	6.6 ± 0.3
WSW-10	4.8 ± 0.3
SW/SSW-1	4.7 ± 0.2
SW-10	4.9 ± 0.3
SSW/SW-5	5.2 ± 0.3
SSW-10	5.3 ± 0.3
S-5	5.0 ± 0.3
S-10	5.3 ± 0.3
SSE/S-1	4.8 ± 0.3
SSE-10	4.7 ± 0.2

NOTES:

1. The error terms reported above are based on an empirical statistical analysis of the differences in the results from the individual dosimeters at each site. As such, these error terms are representative of the typical error for such measurements rather than accurately representing the error terms for individual measurements.

2. These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been done.

3. Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.

1. DIRECT RADIATION - TLDs - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployment 9-23-86 Collection 12-15-86
N-1	Due to failure of the TLD reader normally used, these dosimeters were read out on a new instrument. Final results for these readings cannot be determined until the behavior of these dosimeters (i.e., net response, self-exposure rate, and fading) can be determined on this new instrument. This could not be completed for this report. This data will be included as an addendum to a future report.
N-5	
N-10	
NNW-1	
NNW-10	
NW/WNW-1	
NW-5	
NW-10	
W/WNW-5	
WNW-10	
W-1	
W-10	
WSW-10	
SW/SSW-1	
SW-10	
SSW/SW-5	
SSW-10	
S-5	
S-10	
SSE/S-1	
SSE-10	

2.a IODINE-131 IN WEEKLY AIR FILTERS - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
10-07-86	<0.03	<0.03	<0.03	<0.03	<0.03
10-14-86	<0.03	<0.03	<0.03	<0.03	<0.03
10-21-86	<0.03	<0.03	<0.03	<0.03	<0.03
10-28-86	<0.02	<0.02	<0.02	<0.02	<0.02
11-04-86	<0.03	<0.03	<0.03	<0.02	<0.02
11-12-86	<0.06(A)	<0.06(A)	<0.06(A)	<0.06(A)	<0.06(A)
11-18-86	<0.03	<0.02	<0.02	<0.02	<0.02
11-25-86	<0.03	<0.03	<0.03	<0.03	<0.03
12-02-86	<0.02	<0.02	<0.02	<0.02	<0.02
12-09-86	<0.03	<0.03	<0.03	<0.03	<0.03
12-16-86	<0.02	<0.02	<0.02	<0.02	<0.02
12-22-86	<0.02	<0.02	<0.02	<0.02	<0.02
12-30-86	<0.03	<0.03	<0.03	<0.03	<0.03

(A) - These samples became misdirected in the mail, which resulted in a longer than usual delay before they could be analyzed.

2.b AIR PARTICULATES - GROSS BETA - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
10-07-86	0.017 ± 0.002	0.016 ± 0.002	0.014 ± 0.002	0.017 ± 0.002	0.013 ± 0.002
10-14-86	0.015 ± 0.002	0.013 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.012 ± 0.002
10-21-86	0.015 ± 0.002	0.013 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.016 ± 0.002
10-28-86	0.012 ± 0.002	0.012 ± 0.002	0.014 ± 0.002	0.013 ± 0.002	0.013 ± 0.002
11-04-86	0.010 ± 0.002	0.008 ± 0.001	*0.009 ± 0.001	0.011 ± 0.002	0.010 ± 0.001
11-12-86(A)	0.011 ± 0.002	0.014 ± 0.002	*0.012 ± 0.002	0.010 ± 0.001	0.007 ± 0.001
11-18-86	0.011 ± 0.002	0.009 ± 0.002	*0.011 ± 0.002	0.009 ± 0.002	0.012 ± 0.002
11-25-86	0.008 ± 0.001	0.012 ± 0.002	*0.011 ± 0.002	0.009 ± 0.001	0.010 ± 0.002
12-02-86	0.011 ± 0.002	0.007 ± 0.001	0.008 ± 0.001	0.008 ± 0.001	0.007 ± 0.001
12-09-86	0.011 ± 0.002	0.013 ± 0.002	0.018 ± 0.002	0.015 ± 0.002	0.016 ± 0.002
12-16-86	0.012 ± 0.002	0.010 ± 0.002	0.009 ± 0.001	0.012 ± 0.002	0.010 ± 0.002
12-22-86	0.015 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.012 ± 0.002	0.014 ± 0.002
12-30-86	0.010 ± 0.001	0.016 ± 0.002	0.012 ± 0.002	0.013 ± 0.002	0.020 ± 0.002
Means:	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001

* - DOE split samples.

(A) - These samples became misdirected in the mail, which resulted in a longer than usual delay before they could be analyzed.

2.b AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m^3)

Fourth Quarter, 1986

Sample Site	Be-7	K-40	Cs-134	Cs-137
T51	0.097 ± 0.009	<0.023	<0.0007	<0.0008
T57	0.102 ± 0.008	<0.025	<0.0008	<0.0007
T58	0.112 ± 0.009	<0.024	<0.0008	<0.0007
T64	0.105 ± 0.008	<0.023	<0.0007	<0.0007
T72	0.104 ± 0.007	<0.016	<0.0009	<0.0007

3.a SURFACE WATER - (pCi/1)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	10-13-86	<190	270 ± 50	<4	<9	<4	<6	<10	<9	<6	<4	<5	<8
	11-18-86	<180	240 ± 50	<5	<11	<4	<5	<11	<7	<7	<5	<5	<8
	12-15-86	<260	280 ± 50	<4	<11	<5	<5	<12	<7	<5	<5	<4	<4
T67	10-13-86	<190	280 ± 50	<4	<12	<4	<4	<10	<7	<5	<5	<4	<5
	11-18-86	<180	320 ± 50	<4	<11	<4	<5	<10	<9	<8	<5	<4	<6
	12-16-86	<260	310 ± 50	<4	<8	<4	<4	<10	<9	<5	<5	<5	<7
T81	10-13-86(C)	140 ± 60	320 ± 60	<5	<11	<4	<4	<8	<9	<9	<5	<5	<7
	10-13-86(D)	<190	350 ± 50	<5	<12	<5	<6	<10	<9	<9	<5	<5	<8
	11-18-86(C)	150 ± 60	320 ± 50	<4	<8	<4	<5	<11	<9	<6	<4	<4	<5
	11-18-86(D)	570 ± 60	300 ± 50	<4	<10	<4	<4	<9	<6	<6	<5	<6	<7
	12-15-86(C)	<260	320 ± 50	<4	<9	<4	<5	<9	<8	<5	<5	<5	<7
	12-15-86(D)	<260	360 ± 50	<4	<10	<4	<5	<7	<7	<6	<5	<4	<6

(A) These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLDs.

(B) These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

(C) Collected at the normal location - in the old discharge canal about 200' west of the mouth.

(D) Collected at a comparison location - at the mouth of the old discharge canal on the south side of the prominent embankment in this area.

4.b.1 BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
T40	10-13-86	1550 ± 80	3500 ± 100	<17	<11	452 ± 13
	*11-18-86	1100 ± 60	3600 ± 100	<8	<7	214 ± 9
	12-16-86	1790 ± 70	2500 ± 100	<12	<9	201 ± 9
T41	10-13-86	1540 ± 70	2700 ± 100	<16	<9	312 ± 10
	11-18-86	720 ± 40	3000 ± 100	<6	<7	77 ± 6
	12-16-86	1260 ± 60	3100 ± 100	<10	<11	134 ± 8
T67	10-13-86	780 ± 50	1930 ± 90	<10	<6	60 ± 5
	11-18-86	1080 ± 50	3500 ± 100	<8	<9	<9
	12-16-86	1630 ± 60	4400 ± 100	<11	<9	<10

* - DOE split sample.

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ATTACHMENT C

RESULTS FROM THE
INTERLABORATORY COMPARISON PROGRAM
1986

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

January through June, 1986

Media	Nuclide	Collection Mon	Day	Yr	EPA Known	Units	Normal. Range	Mean of Analyses	N.D.K.	Action Level
FILTER	Alpha	04	25	86	15	pCi/F	0	16	0.34	
FILTER	Beta	04	25	86	47	pCi/F	0.474	46	-0.34	
FILTER	Cs-137	04	25	86	10	pCi/F	0.118	12.66	0.92	
FILTER	Sr-90	04	25	86	18	pCi/F	0.395	15.33	-3.08	(1)
FOOD	I-131	01	31	86	20	pCi/Kg	0.197	20.66	0.19	
FOOD	Cs-137	01	31	86	15	pCi/Kg	0.118	14.33	-0.23	
FOOD	K	01	31	86	950	pCi/Kg	0.248	1013.33	0.77	
FOOD	Sr-89	01	31	86	25	pCi/Kg	0.237	11	-4.85	(2)
FOOD	Sr-90	01	31	86	10	pCi/Kg	0.395	11.66	1.92	
MILK	I-131	10	25	85	42	pCi/L	0.197	49.66	2.21	
MILK	I-131	06	27	86		pCi/L			NA	
MILK	Cs-137	10	25	85	56	pCi/L	0.355	58.67	0.92	
MILK	Cs-137	06	27	86		pCi/L			NA	
MILK	K	10	25	85	1540	pCi/L	0.23	1596.66	1.27	
MILK	K	06	27	86		pCi/L			NA	
MILK	Sr-89	10	25	85	48	pCi/L	0.237	46.66	-0.46	
MILK	Sr-89	06	27	86		pCi/L			NA	
MILK	Sr-90	10	25	85	26	pCi/L	0	24	-2.31	
MILK	Sr-90	06	27	86		pCi/L			NA	
WATER	Alpha	11	22	85	10	pCi/L	0.118	11.66	0.58	
WATER	Alpha	01	24	86	3	pCi/L	0.118	3.66	0.23	
WATER	Alpha	03	21	86	15	pCi/L	0.118	12.33	-0.92	
WATER	Alpha	05	23	86	8	pCi/L	0.118	6.67	-0.46	
WATER	Beta	11	22	85	13	pCi/L	0	16	1.03	
WATER	Beta	01	24	86	7	pCi/L	0.118	7.67	0.23	
WATER	Beta	03	21	86	8	pCi/L	0.118	9.33	0.46	
WATER	Beta	05	23	86	15	pCi/L	0.118	16.66	0.58	
WATER	Cr-51	02	07	86	38	pCi/L	0.576	44	2.07	
WATER	Cr-51	06	06	86	0	pCi/L	0	0	0	
WATER	Co-60	02	07	86	18	pCi/L	0.118	19.66	0.58	
WATER	Co-60	06	06	86	66	pCi/L	0.118	66.67	0.23	
WATER	Zn-65	02	07	86	40	pCi/L	0.237	43	1.03	
WATER	Zn-65	06	06	86	86	pCi/L	0.592	90.67	1.61	
WATER	Ru-106	02	07	86	0	pCi/L	0	0	0	
WATER	Ru-106	06	06	86	50	pCi/L	0.711	50.33	0.11	
WATER	Cs-134	02	07	86	30	pCi/L	0.118	28.66	-0.46	
WATER	Cs-134	06	06	86	49	pCi/L	0.237	47	-0.69	
WATER	Cs-137	02	07	86	22	pCi/L	0.237	22	0	
WATER	Cs-137	06	06	86	10	pCi/L	0	11	0.34	
WATER	H-3	02	14	86	5227	pCi/L	0.091	5183.33	-0.14	
WATER	H-3	06	13	86	3125	pCi/L	0.362	3143.33	0.09	
WATER	I-131	12	06	85	45	pCi/L	0.197	50	1.44	
WATER	Sr-89	01	10	86	31	pCi/L	0.355	29.66	-0.46	
WATER	Sr-89	05	09	86	5	pCi/L	0.237	5	0	
WATER	Sr-90	01	10	86	15	pCi/L	0	15	0	
WATER	Sr-90	05	09	86	5	pCi/L	0.395	4.66	-0.38	

NOTES:

Normal.: Range — Normalized range. As defined in "Environmental Radioactivity Laboratory Intercomparison Studies Program Fiscal Year 1981 - 1982", Environmental Monitoring Systems Laboratory, U. S. Environmental Protection Agency, P. O. Box 15027, Las Vegas, Nevada, 89114. 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.

(1) Cause: Chemical recovery too low. Corrective action: Try to improve recovery.

(2) Cause: Unknown. Corrective action: None at this time.

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

June through December, 1986

Media	Nuclide	Collection Mon	Day	Yr	EPA Known	Units	Normal. Range	Mean of Analyses	N.D.K.	Action Level
FILTER	Alpha	09	12	86	22	pCi/F	0.829	17.33	-1.61	
FILTER	Beta	09	12	86	66	pCi/F	0.237	64.67	-0.46	
FILTER	Cs-137	09	12	86	22	pCi/F	0.237	25.00	1.03	
FILTER	Sr-90	09	12	86	22	pCi/F	0.395	21.33	-0.77	
FOOD	I-131	07	25	86	30	pCi/Kg	0.197	29.00	-0.29	
FOOD	Cs-137	07	25	86	20	pCi/Kg	0.118	21.66	0.58	
FOOD	K	07	25	86	1150	mg/Kg	0.817	1173.33	0.70	
FOOD	Sr-89	07	25	86	30	pCi/Kg			NDP	
FOOD	Sr-90	07	25	86	19	pCi/Kg			NDP	
MILK	I-131	06	27	86	41	pCi/L	0.197	44.00	0.87	
MILK	I-131	10	31	86		pCi/L			NA	
MILK	Cs-137	06	27	86	31	pCi/L	0.000	4.00	-9.35	(1)
MILK	Cs-137	10	31	86		pCi/L			NA	
MILK	K	06	27	86	1600	mg/L	0.296	1616.66	0.36	
MILK	K	10	31	86		mg/L			NA	
MILK	Sr-89	06	27	86	0	pCi/L	0.237	0.67	0.23	
MILK	Sr-89	10	31	86		pCi/L			NA	
MILK	Sr-90	06	27	86	16	pCi/L	0.395	12.33	-4.23	(2)
MILK	Sr-90	10	31	86		pCi/L			NA	
WATER	Alpha	07	18	86	6	pCi/L	0.118	5.67	-0.11	
WATER	Alpha	09	19	86	15	pCi/L	0.000	16.00	0.34	
WATER	Alpha	11	21	86	20	pCi/L	0.237	13.66	-2.19	(3)
WATER	Beta	07	18	86	18	pCi/L	0.000	18.00	0.00	
WATER	Beta	09	19	86	8	pCi/L	0.000	10.00	0.69	
WATER	Beta	11	21	86	20	pCi/L	0.000	22.00	0.69	
WATER	Cr-51	06	06	86	0	pCi/L	0.000	0.00	0.00	
WATER	Cr-51	10	10	86	59	pCi/L	0.592	55.33	-1.27	
WATER	Co-60	06	06	86	66	pCi/L	0.118	66.67	0.23	
WATER	Co-60	10	10	86	31	pCi/L	0.118	31.66	0.23	
WATER	Zn-65	06	06	86	86	pCi/L	0.592	90.67	1.61	
WATER	Zn-65	10	10	86	85	pCi/L	0.576	89.33	1.50	
WATER	Ru-106	06	06	86	50	pCi/L	0.711	50.33	0.11	
WATER	Ru-106	10	10	86	74	pCi/L	1.927	72.00	-0.69	
WATER	Cs-134	06	06	86	49	pCi/L	0.237	47.00	-0.69	
WATER	Cs-134	10	10	86	28	pCi/L	0.237	26.00	-0.69	
WATER	Cs-137	06	06	86	10	pCi/L	0.000	11.00	0.34	
WATER	Cs-137	10	10	86	44	pCi/L	0.237	44.66	0.23	
WATER	H-3	06	13	86	3125	pCi/L	0.362	3143.33	0.09	
WATER	H-3	10	17	86	5973	pCi/L			NDP	
WATER	I-131	08	08	86	45	pCi/L	0.197	41.33	-1.05	

NOTES:

Normal.: Range — Normalized range. As defined in "Environmental Radioactivity Laboratory Intercomparison Studies Program Fiscal Year 1981 - 1982", Environmental Monitoring Systems Laboratory, U. S. Environmental Protection Agency, P. O. Box 15027, Las Vegas, Nevada, 89114. 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.

(1) Cause: Decimal point in wrong position. Corrective action: Use more care in recording data.

(2) Cause: Poor chemical recovery of strontium carrier. Corrective action: Try to improve chemical recovery.

(3) Cause: Unknown. Corrective action: None at this time.