Florida Power & Light Company, 6351 S. Ocean Drive, Jensen Beach, FL 34957



April 17, 2000

L-2000-082 10 CFR 50.4 10 CFR 50.36

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

RE: St. Lucie Units 1 and 2 Docket Nos. 50-335 and 50-389 Annual Radiological Environmental Operating Report for Calendar Year 1999

The enclosed report is being submitted pursuant to Technical Specification 6.9.1.8. The Annual Radiological Environmental Operating Report provides information summaries and analytical results of the Radiological Environmental Monitoring Program (REMP) for calendar year 1999.

Please contact us should there be any questions regarding this information.

Very truly yours,

Rijiv S. Kurlallen

Rajiv Ś. Kundalkar Vice President St. Lucie Plant

Enclosure

RSK/spt

cc: Regional Administrator, USNRC, Region II, Senior Resident Inspector, USNRC, St. Lucie Plant

St. Lucie Units 1 and 2 Docket Nos. 50-335 and 50-389 L-2000-082 Enclosure

÷

1999

ANNUAL

RADIOLOGICAL ENVIRONMENTAL

OPERATING REPORT

ST. LUCIE PLANT

UNITS 1 & 2

LICENSE NOS. DPR-67, NPF-16

DOCKET NOS. 50-335, 50-389

Data Submitted by: Florida DOH

Prepared by: Peter G. Bailey Reviewed by: J. L. Danek

ų,

1

TABLE OF CONTENTS

DESCRIPTION	PAGE
Introduction	1
Radiological Environmental Monitoring Program	1
Discussion and Interpretation of Results	4
Environmental Radiological Monitoring Program Annual Summary	7
Deviations / Missing Data	15
Analyses with LLDs Above Required Detection Capabilities	17
Land Use Census	18
Key to Sample Locations	ATTACHMENT A
Radiological Surveillance of Florida Power and Light Company's St. Lucie Site	ATTACHMENT B
First Quarter, 1999	
Second Quarter, 1999	
Third Quarter, 1999	
Fourth Quarter, 1999	
Results from the Interlaboratory Comparison Program, 1999	ATTACHMENT C

I. INTRODUCTION

This report is submitted pursuant to Specification 6.9.1.8 of St. Lucie Unit 1 & St. Lucie Unit 2 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 1 and Unit 2 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 measurable 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. <u>Program Description</u>

- The Radiological Environmental Monitoring Program (REMP) for the St. Lucie Plant is conducted pursuant to the St. Lucie Unit 1 and St. Lucie Unit 2 Offsite Dose Calculation Manual (ODCM) Control 3/4.12.1.
 - 1. Sample Locations, Types and Frequencies:
 - a. Direct radiation gamma exposure rate is monitored continuously at 27 locations by thermoluminescent dosimeters (TLDs). TLDs 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 lodine-131, gross beta, and gamma isotopic measurements.
 - c. Surface water samples are collected from two locations. Samples are collected and analyzed weekly and monthly, respectively. Analyses include gamma isotopic and tritium measurements.

- d. Shoreline sediment samples are collected from two locations coinciding with the locations for surface water samples. Samples are collected and analyzed semi-annually. Sediment samples are analyzed by gamma isotopic measurements.
- e. Fish and invertebrate samples are collected from two locations. 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 St. Lucie Plant is conducted by the State of Florida, Department of Health (DOH), Bureau of Radiation Control (BRC). Samples are collected and analyzed by DOH personnel.

Samples are analyzed at the DOH BRC Environmental Radiation Control Laboratory in Orlando, Florida.

C. <u>Analytical Results</u>

<u>Table 1, Environmental Radiological Monitoring Program Annual Summary</u> 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

E

A land use census out to a distance of 5 miles radius from the St. Lucie Plant is conducted annually to determine the location of the nearest milk, animal, residence, and garden producing broad leaf vegetation, in each of the 16 meteorological sectors. A summary of the land use census for the surveillance year is provided in Table 2, Land Use Census Summary.

E. Interlaboratory Comparison Program

The intercomparison program consists of participating in the Department of Energy's EML New York Quality Assessment Program (DOE-QAP). The DOE-QAP consists of two rounds of air filter, water, soil, and vegetation matrices. The samples are analyzed using the methods applicable to the REMP (gamma spectroscopy, gross beta, and tritium for water). The results for nuclides associated with the REMP are listed in ATTACHMENT C, RESULTS FROM THE INTERLABORATORY COMPARISON PROGRAM.

Please note that although our laboratory participated in the analysis for alpha in water, the results of this analysis are not used to support St. Lucie's Radiological Environmental Monitoring Program.

III. DISCUSSION AND INTERPRETATION OF RESULTS

A. <u>Reporting of Results</u>

2

The Annual Radiological Environmental Operating Report contains the summaries, interpretations and information required by St. Lucie Plant, ODCM. Table 1 provides a summary of the measurements made for the nuclides required by ODCM, Table 4.12-1, for all samples specified by Table 3.12-1. 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 K-40, Th-232, Ra-226, and Be-7 which are common in the Florida environment.

B. Interpretation of Results

1. Direct Radiation

The results of direct radiation monitoring are consistent with past measurements for the specified locations.

A review of the TLD processing methods was conducted February 4, 2000. This lead to an improvement opportunity that was applied to the 1999 results. The 'corrected' results are within 10% of the original, were used in the compilation of this report and are inserted in the Attachment B quarterly reports.

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 air particulate and radioiodine monitoring are consistent with past measurements and indicate no trends attributed to plant effluents. All samples for radioiodine yielded no detectable I-131. Gamma isotopic measurements yielded no indication of any nuclides attributed to station operation. The results for air particulate/radioiodine samples are consistent with measurements which were made during the preoperational surveillance program. Air particulate and radioiodine monitoring results are summarized in Table 1.

3. Surface Water

Two of twelve samples collected at the indicator location identified tritium. The highest reported value is less than 26% of the required LLD listed in ODCM table 4.12-1. No other nuclides attributed to station operation were detected. Results for surface water samples are summarized in Table 1.

4. Waterborne Sediment and Food Products

The results for radioactivity measurements in waterborne sediment, fish and crustacea samples are consistent with past measurements and with measurements made during the preoperational surveillance program. There were no indications of any nuclides attributed to plant effluents. Results for the waterborne sediment, fish and crustacea samples are summarized in Table 1.

5. Broad Leaf Vegetation

2

The results of radioactivity measurements in broad leaf vegetation are consistent with past measurements and with measurements made during the preoperational surveillance program.

One indicator location sample and one control location sample indicated Cs-137. The highest level is less than 19% of the required LLD listed in ODCM table 4.12-1. There were no indications of any other nuclides attributed to plant effluents. Results for the broad leaf vegetation samples are summarized in Table 1.

6. Land Use Census

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.

7. Interlaboratory Comparison Program

In most cases, the results that were other than "acceptable" were a result of over-estimating the activity.

As a result of the quantity of Warnings for the Air Filter Matrix identified in QAP 51, the laboratory is recalibrating the geometry. It has been determined that the cause is associated with the geometry correction method used by the new software (the software was replaced because of Y2K compliance issues). The software vendor (Canberra) will be involved with the corrections.

C. <u>Conclusions</u>

The data obtained through the St. Lucie 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 St. Lucie Units 1 & 2, during the surveillance year, are well within "as low as reasonably achievable (ALARA)" criteria established by 10 CFR 50, Appendix I.

, X

.....

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY Name of Facility <u>St. Lucie Units 1 & 2</u>, Docket No(s). <u>50-335 & 50-389</u> Location of Facility <u>St. Lucie, Florida</u>, Reporting Period <u>January 1 - December 31, 1999</u> (County, State)

1 of 8

PATHWAY: DIRECT RADIATION SAMPLES COLLECTED: TLD UNITS: micro-R/hr

			Location with High	nest Annual Mean	
			Name ^c	Mean (f) ^b	
Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Distance & Direction	Range	Control Locations Mean (f) ^b Range
Exposure Rate, 107 ^d		5.2 (103/103) 4.4 - 6.9	NW-10 10 mi., NW	6.5 (4/4) 6.0 - 6.9	5.4 (4/4) 5.0 – 6.0

(1)

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY Name of Facility <u>St. Lucie Units 1 & 2</u>, Docket No(s). <u>50-335 & 50-389</u> Location of Facility <u>St. Lucie, Florida</u>, Reporting Period <u>January 1 - December 31, 1999</u> (County, State)

2 of 8

PATHWAY: AIRBORNE SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES UNITS: PICO - Ci/M³

Location with Highest Annual Mean					
			Name ^c	Mean (f) ^b	
Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Distance & Direction	Range	Control Locations Mean (f) ^b Range
¹³¹ l, 258	0.024	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
Gross Beta, 258	0.0025	0.004 (197/207) 0.004 - 0.021	H-14 1 mi., SE	0.013 (49/51) 0.006 - 0.020	0.012 (50/51) 0.004 - 0.022
Composite Gamma Isotopic, 20					
⁷ Be	0.0052	0.12493 (16/16) 0.0603 - 0.1971	H-14 1 mi., SE	0.1436 (4/4) 0.0968 - 0.1971	0.1222 (4/4) 0.0649 - 0.1677
¹³⁴ Cs	0.00069	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³⁷ Cs	0.00066	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
²¹⁰ Pb		0.0132 (16/16) 0.0079 - 0.0229	H-14 1 mi., SE	0.0166 (4/4) 0.0107 - 0.0229	0.0144 (4/4) 0.0118 - 0.0178

 α

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY Name of Facility <u>St. Lucie Units 1 & 2</u>, Docket No(s). <u>50-335 & 50-389</u> Location of Facility <u>St. Lucie, Florida</u>, Reporting Period <u>January 1 - December 31, 1999</u> (County, State)

3 of 8

PATHWAY: WATERBORNE SAMPLES COLLECTED: SURFACE WATER UNITS: PICO - Ci/LITER

			Location with Highest Annual Mean			
			Name ^c	Mean (f) ^b		
Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Distance & Direction	Range	Control Locations Mean (f) ^b Range	
Tritium, 64	230	461 (2/52)	H-15	461 (2/52)	<mda< td=""></mda<>	
		176 - 746	<1 mi., ENE/E/ESE	176 - 746		
Gamma Isotopic, 64						
⁴⁰ K	60	338 (52/52) 249 - 409	H-15 <1 mi., ENE/E/ESE	338 (52/52) 249 - 409	335 (12/12) 269 - 408	
⁵⁴ Mn	4	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	
⁵⁹ Fe	8	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	
⁵⁸ Co	4	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	
⁶⁰ Co	4	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	
⁶⁵ Zn	8	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	
⁹⁵ Zr-Nb	7	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	
¹³¹	5	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	
¹³⁴ Cs	5	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	
¹³⁷ Cs	5	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	
¹⁴⁰ Ba-La	11	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>	

0

1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY Name of Facility <u>St. Lucie Units 1 & 2</u>, Docket No(s). <u>50-335 & 50-389</u> Location of Facility <u>St. Lucie, Florida</u>, Reporting Period <u>January 1 - December 31, 1999</u> (County, State)

4 of 8

PATHWAY: WATERBORNE SAMPLES COLLECTED: SHORELINE SEDIMENT UNITS: PICO - Ci/Kg, DRY

Location with Highest Annual Mean					
			Name ^c	Mean (f) ^ь	
Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Distance & Direction	Range	Control Locations Mean (f) ^b Range
Gamma Isotopic, 4				<u> </u>	
⁴⁰ K	140	5 (2/2) 379 - 1433	H-15 <1 mi, ENE/E/ESE	5 (2/2) 379 - 1433	388 (2/2) 274 - 501
²¹⁰ Pb		615 (1/2)	H-15 <1 mi, ENE/E/ESE	615 (1/2)	<mda< td=""></mda<>
²²⁶ Ra	49	371 (1/2)	H-15 <1 mi., ENE/E/ESE	371 (1/2)	246 (2/2) 187 - 304
²³² Th		177 (1/2)	H-15 <1 mi., ENE/E/ESE	177 (1/2)	146 (1/2)
²³⁸ U		487 (1/2)	H-15 <1 mi., ENE/E/ESE	487 (1/2)	<mda)< td=""></mda)<>
⁵⁸ Co	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁶⁰ Co	12	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³⁴ Cs	14	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³⁷ Cs	12	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>

i

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY Name of Facility <u>St. Lucie Units 1 & 2</u>, Docket No(s). <u>50-335 & 50-389</u> Location of Facility <u>St. Lucie, Florida</u>, Reporting Period <u>January 1 - December 31, 1999</u> (County, State)

5 of 8

PATHWAY: INGESTION SAMPLES COLLECTED: CRUSTACEA UNITS: PICO - Ci/Kg, WET

			Location with Highest Annual Mean		
			Name ^c	Mean (f) ^b	
Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Distance & Direction	Range	Control Locations Mean (f) ^b Range
Gamma Isotopic, 4					
40K	130	836 (2/2) 475 - 1198	H-15 <1 mi., ENE/E/ESE	836 (2/2) 475 - 1198	1830 (2/2) 1514 - 2146
²²⁸ Ra		<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁵⁴ Mn	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁵⁹ Fe	16	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁵⁸ Co	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁶⁰ Co	19	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁶⁵ Zn	17	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³⁴ Cs	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³⁷ Cs	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>

- 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY Name of Facility <u>St. Lucie Units 1 & 2</u>, Docket No(s). <u>50-335 & 50-389</u> Location of Facility <u>St. Lucie, Florida</u>, Reporting Period <u>January 1 - December 31, 1999</u> (County, State)

6 of 8

PATHWAY: INGESTION SAMPLES COLLECTED: FISH UNITS: PICO - Ci/Kg, WET

		Location with Highest Annual Mean			
			Name ^c	Mean (f) ^b	
Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Distance & Direction	Range	Control Locations Mean (f) ^b Range
Gamma Isotopic, 4					
⁴⁰K	130	7 (2/2) 2591 - 3094	H-15 <1 mi., ENE/E/ESE	7 (2/2) 2591 - 3094	7 (2/2) 2016 - 2805
⁵⁴ Mn	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁵⁹ Fe	16	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁵⁸ Co	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁶⁰ Co	10	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
⁶⁵ Zn	17	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³⁴ Cs	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³⁷ Cs	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY Name of Facility <u>St. Lucie Units 1 & 2</u>, Docket No(s). <u>50-335 & 50-389</u> Location of Facility <u>St. Lucie, Florida</u>, Reporting Period <u>January 1 - December 31, 1999</u> (County, State)

7 of 8

PATHWAY: INGESTION SAMPLES COLLECTED: BROAD LEAF VEGETATION UNITS: PICO - Ci/Kg, WET

Location with Highest Annual Mean					
			Name ^c	Mean (f) ^b	
Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Distance & Direction	Range	Control Locations Mean (f) ^b Range
Gamma Isotopic, 36					
⁷ Be	71	896 (24/24) 283 - 2220	H-51 1 mi., N/NNW	910 (12/12) 462 - 2220	1042 (12/12) 563 - 2729
40K	100	4130 (24/24) 2728 - 5457	H-52 1 mi., S/SSE	4484 (12/12) 2788 - 5457	3390 (12/12) 1945 - 4621
²¹⁰ Pb		<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
²¹² Pb		<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³¹	9	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³⁴ Cs	8	<mda< td=""><td></td><td></td><td><mda< td=""></mda<></td></mda<>			<mda< td=""></mda<>
¹³⁷ Cs	8	15 (1/24)	H-52	15 (1/12)	9 (1/12)
			1 mi., S/SSE		

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY Name of Facility <u>St. Lucie Units 1 & 2</u>, Docket No(s). <u>50-335 & 50-389</u> Location of Facility <u>St. Lucie, Florida</u>, Reporting Period <u>January 1 - December 31, 1999</u> (County, State)

8 of 8

<u>NOTES</u>

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.

LLDs 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 were based upon the average net response of three elements in a TLD. (Thermoluminescent Dosimeter).

MDA refers to minimum detectable activity.

TABLE 1A (page 1 of 2)

DEVIATIONS / MISSING DATA

A)	Pathway:	Direct Exposure
	Location:	WSW-5, 5 miles WSW
	Dates:	Second Calandar Quarter
	Deviation:	Failure to provide continuous monitoring.
	Description of Problem:	Second quarter TLD deployed March 9, 1999. Mid-cycle tour of sampling locations, May 3, 1999, found this TLD to be missing.
	Corrective Action:	Replace missing TLD upon discovery of loss (May 3, 1999).

B)	Pathway:	Direct Exposure
	Locations:	S-10, 10 miles S
	Dates:	09/13/99 to 12/14/99
	Deviation:	Failure to provide continuous monitoring.
	Description of Problem:	TLD's missing when collection was attempted.
	Corrective Action:	Replaced missing TLD.

TABLE 1A (page 2 of 2)

DEVIATIONS / MISSING DATA

C)	Pathway:	Airborne; Radioiodine 131 & Particulates
	Location:	H-14, 1 mile SE
	Dates:	08/16/99 to 08/26/99
	Deviation:	Failure to provide continuous monitoring.
	Description of Problem:	Power outage and air sampling pump motor failure early in sampling period.
	Corrective Action:	Replaced air sampling pump, verified sampling equipment as operable.
D)	Pathway:	Airborne; Radioiodine 131 & Particulates
	Locations:	H-14, 1 mile S
	Dates:	08/26/99 to 08/31/99 and 08/31/99 to 09/08/99
	Deviation:	Failure to provide continuous monitoring.
	Description of Problem:	Extended power outage affecting both sampling periods.
	Corrective	Restored power, verified sampling equipment as operable.
	Action:	
E)	Pathway:	Airborne; Radioiodine 131 & Particulates
	Locations:	H-12, 12 miles S (control location)
	Dates:	08/31/99 to 09/08/99
	Deviation:	Failure to provide continuous monitoring.
	Description of Problem:	Air sampling pump motor failure.
	Corrective Action:	Replaced air sampling pump, verified sampling equipment as operable.

.

TABLE 1B

ANALYSIS WITH LLDs ABOVE TABLE 4.12-1 DETECTION CAPABILITIES 1/1/99 – 12/31/99

- A) Pathway : Radioiodine 131 & Particulates
 - Sample Type : Air Filter and lodine Cartridge

Location : H-14, 1 mile S

- Deviation : Gross Beta Analysis failed to meet required LLD of 0.01 pCi/m³ lodine Cartridge analysis failed to meet the required LLD of 0.07 pCi/m³
- Cause : The sample size (volume) was insufficient to support the required LLDs. The insufficient volume was due to sample site power outages, described as entry D in Table 1A.

The values specified in ODCM Table 4.12-1, Detection Capabilities, were achieved for all other samples.

TABLE 2

LAND USE CENSUS

Distance to Nearest (a, b)

Sector	7/99 Milk (c) Animal	7/99 Residence	7/99 Garden (d)
N	O (e)	0	0
NNE	0	0	0
NE	0	0	0
ENE	0	0	0
Е	0	0	0
ESE	0	0	0
SE	0	1.5/141 (g)	0
SSE	L (f)	3.3/153 (g)	L
S	L	3.6/190	L
SSW	L	2.3/214	L
SW	L	1.9/236	L
WSW	L	1.9/244 (h)	L
W	L	1.9/263	L
WNW	L	2.2/282	L
NW	L	3.1/304	L
NNW	L	L (g)	L

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT ST. LUCIE PLANT - UNITS 1 & 2

TABLE 2

LAND USE CENSUS

NOTES

- a. All categories surveyed out to 5 miles radius from the St. Lucie Plant.
- b. The following format is used to denote the location:

distance (miles)/bearing (degrees)

For example, a residence located in the southeast sector at a distance of 1.5 miles bearing 141 degrees is recorded as 1.5/141.

- c. Potential milk animal locations. All locations specified have been verified to be not producing milk for human consumption.
- d. Gardens with an estimated growing area of 500 square feet or more.
- e. O denotes that the sector area is predominantly an ocean area.
- f. L denotes that the sector area is predominantly a land area unoccupied by the category type.
- g. Non-residential occupied buildings in these sectors include the following:

<u>Sector</u>	Distance	Description
SE	1.1/132	Lifeguard station at beach
SSE	1.8/149	Fire Station
NNW	2.8/348	A new community is being developed, At the current time, there are no houses available for occupancy.

h. Several residences in this sector are located approximately 1.9 miles from the St. Lucie Plant.

ATTACHMENT A

KEY TO SAMPLE LOCATIONS

SITE AREA MAP & ENVIRONMENTAL SAMPLE LOCATIONS



Ļ

ENVIRONMENTAL SAMPLE LOCATIONS (10 MILES)



: :

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT ST. LUCIE PLANT - UNITS 1 & 2

ATTACHMENT A

PAGE 1 OF 4

PATHWAY: DIRECT RADIATION SAMPLES COLLECTED: TLD SAMPLE COLLECTION FREQUENCY: QUARTERLY

_

Location <u>Name</u>	Direction <u>Sector</u>	Approximate Distance _(miles)_	Description
N-1	Ν	1	A1A, North of Blind Creek
NNW-5	NNW	5	South of Pete Stone Creek
NNW-10	NNW	9	Coast Guard Station
NW-5	NW	6	Indian River Dr., at Rio Vista Dr.
NW-10	NW	10	S.R. 68 at S.R. 607
WNW-2	WNW	3	Cemetery South of 7107 Indian River Dr.
WNW-5	WNW	5	U.S. 1 at S.R. 712
WNW-10	WNW	10	S.R. 70, West of Turnpike
W-2	W	2	7609 Indian River Drive
W-5	W	5	Oleander and Sager Street
W-10	W	9	Interstate 95 at S.R. 709
WSW-2	WSW	2	8503 Indian River Dr.
WSW-5	WSW	5	Prima Vista at Yacht Club
WSW-10	WSW	10	Del Rio at Davis Street
SW-2	SW	2	9207 Indian River Drive
SW-5	SW	5	U.S. 1 at Village Green Dr.
SW-10	SW	10	Port St. Lucie Blvd. at Cairo Rd.
SSW-2	SSW	3	10307 Indian River Drive
SSW-5	SSW	6	U.S. 1 at Port St. Lucie Blvd.
SSW-10	SSW	8	Pine Valley at Westmoreland Rd.
S- 5	S	5	13179 Indian River Drive
S-10	S	10	U.S. 1 at S.R. 714
S/SSE-10	SSE	10	Indian River Dr. at Quail Run Lane
SSE-5	SSE	5	Entrance to Nettles Island
SSE-10	SSE	10	Elliot Museum
SE-1	SE	1	South of Cooling Canal
Control:			
H-32	NNW	19	University of Florida IFAS Vero Beach

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT ST. LUCIE PLANT - UNITS 1 & 2

ATTACHMENT A

PAGE 2 OF 4

PATHWAY: AIRBORNE SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES SAMPLE COLLECTION FREQUENCY: WEEKLY

Location <u>Name</u>	Direction Sector	Approximate Distance _(miles)_	Description
H-08	WNW	6	FPL Substation, Weatherby Rd.
H-14	SE	1	On-Site, Near South Property Line
H-30	W	2	Power Line, 7609 Indian River Drive
H-34	Ν	0.5	On-Site at Meteorology Tower
Control:			
H-12	S	12	FPL Substation, SR-76 Stuart

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT ST. LUCIE PLANT - UNITS 1 & 2

ATTACHMENT A

PAGE 3 OF 4

PATHWAY: WATERBORNE SAMPLES COLLECTED: SURFACE WATER (OCEAN) SAMPLE COLLECTION FREQUENCY: H-15 WEEKLY, H-59 MONTHLY

_

Location <u>Name</u>	Direction Sector	Approximate Distance _(miles)	Description
H-51	ENE/E/SSE	<1	Atlantic Ocean, Public Beaches East Side A1A
Control:			
H-59	S/SSE	10-20	South End, Hutchinson Island

SAMPLES COLLECTED: SHORELINE SEDIMENT SAMPLE COLLECTION FREQUENCY: SEMI-ANNUALLY

Location <u>Name</u>	Direction Sector	Approximate Distance _(miles)_	<u>Description</u>
H-15	ENE/E/ESE	<1	Atlantic Ocean, Public Beaches East Side A1A
Control:			
H-59	S/SSE	10-20	South End, Hutchinson Island

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT ST. LUCIE PLANT - UNITS 1 & 2

ATTACHMENT A

PAGE 4 OF 4

PATHWAY: INGESTION SAMPLES COLLECTED: CRUSTACEA AND FISH SAMPLE COLLECTION FREQUENCY: SEMI-ANNUALLY

Location <u>Name</u>	Direction Sector	Approximate Distance (miles)	Description
H-15	ENE/E/ESE	<1	Ocean Side, Vicinity of St. Lucie Plant
Control:			
H-59	S/SSE	10-20	South End, Hutchinson Island

SAMPLES COLLECTED: BROAD LEAF VEGETATION SAMPLE COLLECTION FREQUENCY: MONTHLY

Location <u>Name</u>	Direction Sector	Approximate Distance (miles)	Description
H-51	N/NNW	1	Off-site Near North Property Line
H-52	S/SSE	1	Off-site Near South Property Line
Control:			
H-59	S/SSE	10-20	South End, Hutchinson Island

ATTACHMENT B

RADIOLOGICAL SURVEILLANCE OF FLORIDA POWER AND LIGHT COMPANY'S

ST. LUCIE SITE

1999

First Quarter, 1999 Second Quarter, 1999 Third Quarter, 1999

Fourth Quarter, 1999



RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

FIRST QUARTER 1999

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Technical Specifications Sampling

First Quarter, 1999

Sample Type	Collection Frequency	Locations Sampled	Number of <u>Samples</u>
1. Direct Radiation	Quarterly	27	27
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne3.a. Surface Water	Weekly Monthly	1 1	13 3
3.b. Shoreline Sediment	Semiannually	2	2
4. Ingestion4.a. Fish and Invertebrates4.a.1. Crustacea	Semiannually	2	2
4.a.2. Fish	Semiannually	2	2
4.b. Broadleaf Vegetation	Monthly	3	9

Total: 188

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 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.

1. DIRECT RADIATION - TLDs - (µR/hour)

-

2

÷

Sample Site	Deployment 08-Dec-98 Collection 09-Mar-99	Sample Site	Deployment 08-Dec-98 Collection 09-Mar-99
N-1	5.1 ± 0.2	SW-2	4.7 ± 0.2
NNW-5	4.9 ± 0.2	SW-5	5.8 ± 0.2
NNW-10	4.9 ± 0.2	SW-10	4.5 ± 0.2
NW-5	4.4 ± 0.2	SSW-2	4.6 ± 0.2
NW -10	5.9 ± 0.2	SSW-5	4.8 ± 0.2
		SSW-10	4.9 ± 0.2
WNW-2	4.9 ± 0.2		
WNW-5	4.6 ± 0.2	S-5	4.6 ± 0.2
WNW-10	4.8 ± 0.2	S-10	4.8 ± 0.2
		S/SSE-10	4.5 ± 0.2
W-2	5.2 ± 0.2		
W-5	5.3 ± 0.2	SSE-5	4.5 ± 0.2
W -10	5.2 ± 0.2	SSE-10	4.9 ± 0.2
WSW-2	4.9 ± 0.2	SE-1	4.3 ± 0.2
WSW-5	4.9 ± 0.2		
WSW-10	4.4 ± 0.2	H-32	5.3 ± 0.2

ST. LUCIE CORRECTED 1999 TLD RESULTS

FIRST QUARTER

-

2

Sample Site	Deployment 08-Dec-98 Collection 09-Mar-99	Sample Site	Deployment 08-Dec-98 Collection 09-Mar-99
N-1	5.2 ± 0.2	SW-2	4.8 ± 0.2
NNW-5	4.9 ± 0.2	SW-5	5.9 ± 0.2
NNW-10	5.0 ± 0.2	SW-10	4.6 ± 0.2
NW-5	4.5 ± 0.2	SSW-2	4.7 ± 0.2
NW-10	6.0 ± 0.2	SSW-5	4.9 ± 0.2
		SSW-10	5.0 ± 0.2
WNW-2	4.9 ± 0.2		
WNW-5	4.7 ± 0.2	S-5	4.7 ± 0.2
WNW-10	4.9 ± 0.2	S-10	4.9 ± 0.2
		S/SSE-10	4.5 ± 0.2
W-2	5.2 ± 0.2		
W-5	5.4 ± 0.2	SSE-5	4.6 ± 0.2
W-10	5.2 ± 0.2	SSE-10	5.0 ± 0.2
WSW-2	5.0 ± 0.2	SE-1	4.4 ± 0.2
WSW-5	5.0 ± 0.2		
WSW-10	4.5 ± 0.2	H-32	5.4 ± 0.2

SL QR99-1

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/ m³)

.

Collection Date	<u>H08</u>	H12	<u>H14</u>	<u>H30</u>	H34
04-Jan-99	< 0.03	< 0.03	<0.04	< 0.03	<0.04
11-Jan-99	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
20-Jan-99	< 0.01	<0.01	< 0.01	< 0.01	<0.01
26-Jan-99	< 0.02	< 0.03	< 0.03	< 0.02	<0.03
01-Feb-99	< 0.03	<0.03	< 0.03	<0.03	< 0.03
09-Feb-99	<0.02	<0.02	< 0.02	< 0.02	< 0.02
15-Feb-99	<0.02	< 0.02	< 0.02	< 0.03	< 0.02
22-Feb-99	<0.01	<0.01	<0.01	< 0.01	<0.01
03-Mar-99	< 0.01	<0.01	< 0.01	< 0.01	< 0.01
09-Mar-99	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
16-Mar-99	< 0.03	< 0.03	< 0.03	<0.03	< 0.03
22-Mar-99	< 0.02	< 0.02	< 0.03	< 0.02	< 0.03
30-Mar-99	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

÷

			Sample Sites		
Collection Date	H08	<u>H12</u>	H14	H30	<u>H34</u>
04-Jan-99	0.007 ± 0.002	0.007 ± 0.002	0.015 ± 0.003	0.012 ± 0.003	<0.009
11-Jan-99	0.014 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.010 ± 0.002	0.016 ± 0.002
20-Jan-99	0.013 ± 0.002	0.009 ± 0.002	0.009 ± 0.001	0.009 ± 0.002	0.012 ± 0.002
26-Jan-99	0.013 ± 0.002	0.011 ± 0.002	0.014 ± 0.003	0.011 ± 0.002	0.012 ± 0.002
01-Feb-99	0.013 ± 0.002	0.014 ± 0.002	0.013 ± 0.002	0.008 ± 0.002	0.015 ± 0.002
09-Feb-99	0.011 ± 0.002	0.012 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.011 ± 0.002
15-Feb-99	0.011 ± 0.002	0.012 ± 0.002	0.014 ± 0.002	< 0.005	0.009 ± 0.002
22-Feb-99	0.012 ± 0.002	0.019 ± 0.003	0.013 ± 0.002	0.017 ± 0.002	0.016 ± 0.002
03-Mar-99	0.018 ± 0.002	0.016 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.015 ± 0.002
09-Mar-99	0.019 ± 0.002	0.012 ± 0.002	0.015 ± 0.002	0.019 ± 0.003	0.015 ± 0.002
16-Mar-99	0.021 ± 0.002	0.017 ± 0.002	0.015 ± 0.002	0.019 ± 0.002	0.017 ± 0.002
22-Mar-99	0.016 ± 0.002	0.014 ± 0.002	0.017 ± 0.002	0.007 ± 0.002	0.014 ± 0.002
30-Mar-99	0.021 ± 0.002	0.020 ± 0.002	0.018 ± 0.002	0.020 ± 0.002	0.019 ± 0.002
		0.044 0.005	0.014 0.001	0.010	.0.014
Mean:	0.015 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	<0.013	<0.014

2.b.2. AIR PARTICULATES GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m³)

First Quarter, 1999

Sample Site	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
H08	0.1571 ± 0.0099	< 0.0165	<0.0006	<0.0009	0.0119 ± 0.0028
H12	0.1677 ± 0.0118	<0.0160	<0.0008	<0.0009	0.0118 ± 0.0032
H14	0.1971 ± 0.0122	< 0.0221	<0.0008	< 0.0009	0.0155 ± 0.0030
H30	0.1476 ± 0.0113	< 0.0163	< 0.0010	< 0.0007	0.0115 ± 0.0027
H34	0.1929 ± 0.0120	<0.0192	< 0.0008	< 0.0007	0.0124 ± 0.0031

ı 1

3.a. SURFACE WATER - (pCi/L)

Sample	Collection								Zr-95				Ba-140
Site	Date	<u>H-3</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Nb-95</u> (A)	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>La-140</u> (B)
H15	04-Jan-99	<145	335 ± 37	<4	<3	<7	<4	<8	<6	<4	<4	<5	<5
	11-Jan-99	<144	351 ± 15	<1	<1	<3	<2	<3	<3	<3	<2	<2	<2
	21-Jan-99	<153	324 ± 32	<3	<4	<6	<5	<8	<7	<6	<4	<4	<5
	26-Jan-99	<152	294 ± 35	<3	<3	<7	<4	<7	<6	<5	<4	<4	<6
	01-Feb-99	<144	344 ± 36	<3	<4	<7	<4	<7	<7	<5	<4	<4	<4
	09-Feb-99	<144	332 ± 37	<4	<4	<7	<4	<8	<7	<7	<4	<4	<5
	15-Feb-99	<144	340 ± 34	<3	<3	<7	<3	<9	<7	<4	<4	<3	<9
	22-Feb-99	<144	342 ± 35	<3	<4	<4	<4	<8	<7	<4	<4	<4	<10
	03-Mar-99	<149	378 ± 35	<4	<4	<6	<4	<8	<6	<5	<4	<3	<7
	09-Mar-99	<149	331 ± 35	<4	<4	<8	<3	<7	<7	<8	<5	<4	<6
	16-Mar-99	<149	305 ± 32	<3	<3	<7	<4	<7	<7	<5	<4	<4	<5
	22-Mar-99	<143	351 ± 16	<2	<2	<3	<2	<3	<3	<2	<2	<2	<3
	30-Mar-99	<140	358 ± 15	<1	<1	<3	<2	<3	<2	<2	<2	<2	<3
H59	04-Jan-99	<145	331 ± 40	<4	<4	<8	<4	<9	<6	<6	<4	<4	<4
	02-Feb-99	<144	307 ± 34	<3	<3	<8	<4	<8	<7	<5	<4	<4	<6
	10-Mar-99	<149	316 ± 35	<4	<4	<7	<4	<8	<7	<7	<4	<4	<5

(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. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample <u>Site</u>	Collection Date	<u>Be-7</u>	<u>K-40</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>	<u>Th-232</u>	<u>U-238</u>
H15	15-Feb-99	<61	379 ± 46	<6	<6	<9	<7	<612	<40	<38	<304
H59	16-Feb-99	<62	274 ± 43	<5	<6	<8	<6	<669	-187 ± 9	<44	<314

4.a.1. CRUSTACEA - (H15: Rockcrab, Calico Crab) (H59: Blue Crab) - (pCi/kg, wet weight)

Sample	Collection										
Site	Date	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>
H15	01-Feb-99	1198 ± 158	<17	<18	<32	<18	<36	<26	<17	<326	<100
H59	27-Jan-99	1514 ± 179	<21	<15	<38	<24	<43	<20	<20	<425	<125

4.a.2. FISH - (H15: Spadefish, Rockfish) (H59: Bass) - (pCi/kg, wet weight)

Sample <u>Site</u>	Collection Date	K-40	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>
H15	27-Jan-99	2591 ± 214	<16	<18	<37	<22	<39	<18	<16	<313	<70
H59	27-Jan-99	2016 ± 285	<21	<26	<56	<33	<62	<25	<30	<458	<99

۰.

.

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

Sample Site	Collection Date	Be-7	<u>K-40</u>	I-131	<u>Cs-134</u>	<u>Cs-137</u>	Pb-210	Ra-226
H51	04-Jan-99	726 ± 61	5085 ± 178	<14	<13	<13	<693	<263
	02-Feb-99	2220 ± 89	2728 ± 122	<10	<10	<9	<695	<257
	10-Mar-99	673 ± 66	4765 ± 165	<16	<12	<13	<698	<217
H52	04-Jan-99	948 ± 69	5193 ± 171	<13	<12	<13	<674	<244
	02-Feb-99	2176 ± 83	4012 ± 147	<10	<11	<11	<734	<240
	10-Mar-99	1025 ± 75	4870 ± 170	<17	<15	<10	<725	<251
H59	04-Jan-99	1240 ± 76	2957 ± 126	<14	<12	<12	<666	<228
	02-Feb-99	2729 ± 103	3216 ± 146	<11	<11	<12	<776	<271
	10-Mar-99	738 ± 66	3860 ± 157	<17	<12	<14	<797	<247



RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

SECOND QUARTER 1999

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Technical Specifications Sampling

Second Quarter, 1999

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	27	27
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne		_	10
3.a. Surface Water	Weekly	1	13
	Monthly	1	3
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. Broadleaf Vegetation	Monthly	3	9

Total: 182

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 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.

Sample Site	Deployment 09-Mar-99 Collection 08-Jun-99	Sample Site	Deployment 09-Mar-99 Collection 08-Jun-99
N-1	5.1 ± 0.2	SW-2	4.8 ± 0.2
		SW-5	6.0 ± 0.2
NNW-5	5.1 ± 0.2	SW-10	5.1 ± 0.2
NNW-10	5.0 ± 0.2		
		SSW-2	4.8 ± 0.2
NW-5	5.3 ± 0.2	SSW-5	5.2 ± 0.2
NW-10	6.5 ± 0.3	SSW-10	5.4 ± 0.2
WNW-2	5.2 ± 0.2	S-5	5.0 ± 0.2
WNW-5	4.9 ± 0.2	S-10	5.0 ± 0.2
WNW-10	5.0 ± 0.2		
		S/SSE-10	4.9 ± 0.2
W-2	5.6 ± 0.2		
W-5	5.4 ± 0.2	SSE-5	4.7 ± 0.2
W-10	5.4 ± 0.2	SSE-10	4.8 ± 0.2
WSW-2	5.0 ± 0.2	SE-1	4.6 ± 0.2
WSW-5	5.0 ± 0.3 (A)		
WSW-10	4.6 ± 0.2	H-32	4.9 ± 0.2

1. DIRECT RADIATION - TLDs - (µR/hour)

(A)The monitoring period for this site was May 3 – June 8 due to the replacement of a missing TLD.

ST. LUCIE CORRECTED 1999 TLD RESULTS

Sample Site	Deployment 09-Mar-99 Collection 08-Jun-99	Sample Site	Deployment 09-Mar-99 Collection 08-Jun-99
N-1	5.2 ± 0.2	SW-2	4.9 ± 0.2
		SW-5	6.1 ± 0.2
NNW-5	5.2 ± 0.2	SW-10	5.1 ± 0.2
NNW-10	5.1 ± 0.2		
		SSW-2	4.9 ± 0.2
NW-5	5.4 ± 0.2	SSW-5	5.3 ± 0.2
NW-10	6.6 ± 0.3	SSW-10	5.5 ± 0.2
WNW-2	5.2 ± 0.2	S-5	5.1 ± 0.2
WNW-5	4.9 ± 0.2	S-10	5.1 ± 0.2
WNW-10	5.1 ± 0.2		
		S/SSE-10	5.0 ± 0.2
W-2	5.7 ± 0.2		
W-5	5.5 ± 0.2	SSE-5	4.8 ± 0.2
W-10	5.5 ± 0.2	SSE-10	4.9 ± 0.2
WSW-2	5.1 ± 0.2	SE-1	4.7 ± 0.2
WSW-5	5.1 ± 0.3 (A)		
WSW-10	4.6 ± 0.2	H-32	5.0 ± 0.2

SECOND QUARTER

(A)The monitoring period for this site was May 3 – June 8 due to the replacement of a missing TLD.

SL QR99-2

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m³)

-

.

Collection Date	H08	H12	<u>H14</u>	<u>H30</u>	H34
05-Apr-99	< 0.03	<0.03	< 0.03	< 0.03	<0.03
13-Apr-99	< 0.01	< 0.01	< 0.01	<0.01	<0.01
20-Apr-99	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
27-Apr-99	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
03-May-99	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
10-May-99	< 0.02	< 0.02	< 0.02	< 0.02	< 0.04
17-May-99	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
24-May-99	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
02-Jun-99	<0.01	< 0.01	< 0.01	< 0.01	< 0.01
07-Jun-99	< 0.03	< 0.02	< 0.02	< 0.03	< 0.02
16-Jun-99	<0.01	< 0.02	< 0.02	< 0.01	< 0.02
23-Jun-99	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
29-Jun-99	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

.

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

.....

		Sam	ple Site		
Collection Date	H08	H12	<u>H14</u>	H30	<u>H34</u>
05-Apr-99	0.021 ± 0.003	0.013 ± 0.002	0.019 ± 0.003	0.015 ± 0.002	0.014 ± 0.002
13-Apr-99	0.014 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.015 ± 0.002
20-Apr-99	0.018 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.012 ± 0.002	0.014 ± 0.002
27-Apr-99	0.014 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.016 ± 0.002	0.013 ± 0.002
03-May-99	0.006 ± 0.002	0.004 ± 0.002	0.007 ± 0.002	0.005 ± 0.002	0.006 ± 0.002
10-May-99	0.010 ± 0.002	0.012 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.007 ± 0.003
17-May-99	0.013 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.009 ± 0.002
24-May-99	0.007 ± 0.002	0.010 ± 0.002	0.012 ± 0.002	0.009 ± 0.002	0.011 ± 0.002
02-Jun-99	0.016 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.013 ± 0.002
07-Jun-99	0.007 ± 0.002	0.007 ± 0.002	0.007 ± 0.002	0.005 ± 0.002	0.010 ± 0.002
16-Jun-99	0.008 ± 0.001	0.008 ± 0.002	0.008 ± 0.002	0.006 ± 0.001	0.008 ± 0.002
23-Jun-99	0.009 ± 0.002	0.006 ± 0.002	0.010 ± 0.002	0.006 ± 0.002	0.010 ± 0.002
29-Jun-99	0.008 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.007 ± 0.002	0.009 ± 0.002
Mean:	0.011 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.010 ± 0.001	0.011 ± 0.001

2.b.2. AIR PARTICULATES GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m3)

Second Quarter, 1999

Sample Site	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
H08	0.1135 ± 0.0115	<0.0202	<0.0009	<0.0006	0.0152 ± 0.0031
H12	0.1228 ± 0.0096	<0.0186	< 0.0010	<0.0009	0.0131 ± 0.0028
H14	0.1217 ± 0.0098	<0.0187	<0.0008	< 0.0007	0.0107 ± 0.0023
H30	0.1060 ± 0.0097	<0.0201	<0.0009	<0.0007	0.0090 ± 0.0030
H34	0.1093 ± 0.0100	<0.0166	<0.0010	<0.0009	0.0119 ± 0.0030

3.a. SURFACE WATER - (pCi/L)

Sample	Collection								Zr-95				Ba-140
<u>Site</u>	Date	<u>H-3</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Nb-95</u> (A)	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>La-140</u> (B)
H15	05-Apr-99	<148	340 ± 33	<3	<4	<6	<5	<8	<8	<5	<4	<4	<5
	13-Apr-99	176 ± 25	329 ± 32	<4	<5	<7	<4	<9	<8	<5	<4	<4	<7
	20-Apr-99	<147	336 ± 17	<2	<1	<3	<2	<3	<3	<2	<2	<2	<3
	27-Apr-99	<147	362 ± 17	<1	<2	<3	<2	<3	<3	<2	<2	<2	<4
	03-May-99	<146	285 ± 31	<4	<3	<6	<5	<7	<7	<5	<4	<4	<6
	10-May-99	<146	353 ± 23	<2	<2	<5	<3	<5	<4	<3	<3	<3	<4
	17-May-99	<146	329 ± 32	<3	<3	<5	<4	<6	<6	<4	<4	<4	<9
	24-May-99	<146	323 ± 30	<3	<3	<6	<4	<7	<5	<4	<4	<3	<9
	02-Jun-99	<147	353 ± 13	<1	<1	<2	<1	<2	<2	<1	<1	<1	<1
	08-Jun-99	<147	321 ± 37	<3	<3	<8	<4	<8	<7	<5	<4	<4	<8
	16-Jun-99	<147	331 ± 34	<4	<4	<7	<4	<8	<5	<4	<5	<4	<6
	22-Jun-99	<147	253 ± 33	<4	<3	<7	<4	<8	<7	<4	<5	<5	<5
	29-Jun-99	<146	249 ± 36	<3	<3	<8	<4	<9	<7	<4	<4	<4	<7
H59	05-Apr-99	<148	323 ± 16	<2	<2	<3	<2	<3	<3	<2	<2	<2	<2
	03-May-99	<146	363 ± 32	<3	<4	<7	<5	<7	<8	<5	<4	<5	<5
	17-Jun-99	<147	333 ± 36	<4	<4	<8	<6	<9	<6	<5	<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. 3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample <u>Site</u>	Collection Date	<u>Be-7</u>	<u>K-40</u>	<u>Co-</u>	<u>58 (</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-2</u>	1 <u>0 Ra</u>	<u>-226</u>	<u>Th-232</u>	<u>U-238</u>
	These s	samples wei	re previous	sly colle	cted.								
4.a.1. CRUS	STACEA - (pC	<u>'i/kg, wet w</u>	veight)										
Sample	Collection	12 4		Ma 54	C . 59	Ea 50	Co 60	7n 65	Co 124	Co 127	\mathbf{D}_{0}	26	Do-228
Sile	_Date_	<u>K-4</u>	<u>HU _</u>	<u>MN-54</u>	<u>C0-38</u>	<u>Fe-39</u>	<u>C0-00</u>	<u>ZII-05</u>	<u>CS-154</u>	<u>CS-157</u>	<u>_Na-2</u>	20_	<u>Na-220</u>
	These sa	imples were	e previously	y collect	ted.								
4.a.2. FISH	- (pCi/kg, wet	weight)											
	(<u>p</u> (p)												
Sample	Collection												
Site	Date	<u> </u>	<u>40 </u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-2</u>	26	<u>Ra-228</u>

These samples were previously collected.

•

٠

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

Sample Site	Collection Date	Be-7	<u>K-40</u>	I-131	<u>Cs-134</u>	<u>Cs-137</u>	Pb-210	<u>Ra-226</u>
H51	05-Apr-99	782 ± 68	4936 ± 161	<17	<11	<12	<664	<240
	03-May-99	713 ± 57	3157 ± 136	<11	<11	<12	<682	<220
	17-Jun-99	540 ± 51	2980 ± 138	<9	<12	<13	<613	<233
H52	05-Apr-99	776 ± 33	3960 ± 70	<8	<5	<5	<305	<101
	03-May-99	283 ± 59	5405 ± 174	<13	<15	<13	<679	<251
	17-Jun-99	647 ± 60	4368 ± 155	<10	<11	<12	<608	<213
H59	05-Apr-99	590 ± 61	3905 ± 177	<16	<13	<17	<931	<309
	03-May-99	563 ± 23	3530 ± 62	<5	<5	9 ± 2	<313	<99
	17-Jun-99	607 ± 54	3326 ± 130	<10	<10	<11	<566	<190



RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

THIRD QUARTER 1999

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Technical Specifications Sampling

Third Quarter, 1999

Sample Type	Collection Frequency	Locations Sampled	Number of <u>Samples</u>
1. Direct Radiation	Quarterly	27	27
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Weekly	1	13
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	2	2
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			_
Broadleaf Vegetation	Monthly	3	9

Total: 188

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-standarddeviation error term. Measurement results that are <u>not</u> significantly above background are reported 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.

Sample Site	Deployment 08-Jun-99 Collection 13-Sep-99	Sample Site	Deployment 08-Jun-99 Collection 13-Sep-99
N-1	5.2 ± 0.2	SW-2	4.9 ± 0.2
		SW-5	6.2 ± 0.3
NNW-5	5.1 ± 0.2	SW- 10	5.1 ± 0.2
NNW-10	5.2 ± 0.2		
		SSW-2	4.7 ± 0.2
NW-5	5.2 ± 0.2	SSW-5	5.2 ± 0.2
NW-10	6.5 ± 0.3	SSW-10	5.4 ± 0.2
WNW-2	5.4 ± 0.2	S-5	4.9 ± 0.2
WNW-5	4.9 ± 0.2	S-1 0	5.4 ± 0.2
WNW-10	5.4 ± 0.2		
		S/SSE-10	5.0 ± 0.2
W-2	5.5 ± 0.2		
W-5	5.3 ± 0.2	SSE-5	4.9 ± 0.2
W-10	5.2 ± 0.2	SSE-10	5.0 ± 0.2
WSW-2	5.2 ± 0.2	SE-1	4.7 ± 0.2
WSW-5	5.2 ± 0.2		
WSW-10	4.5 ± 0.2	H-32	5.5 ± 0.2

1. DIRECT RADIATION - TLDs - (µR/hour)

_

.

ST. LUCIE CORRECTED 1999 TLD RESULTS

THIRD QUARTER

Sample Site	Deployment 08-Jun-99 Collection 13-Sep-99	Sample Site	Deployment 08-Jun-99 Collection 13-Sep-99
N-1	5.1 ± 0.2	SW-2	4.8 ± 0.2
		SW-5	6.1 ± 0.3
NNW-5	5.0 ± 0.2	SW-10	5.0 ± 0.2
NNW-10	5.1 ± 0.2		
		SSW-2	4.6 ± 0.2
NW-5	5.1 ± 0.2	SSW-5	5.1 ± 0.2
NW-10	6.4 ± 0.3	SSW-10	5.3 ± 0.2
WNW-2	5.3 ± 0.2	S-5	4.8 ± 0.2
WNW-5	4.8 ± 0.2	S-10	5.3 ± 0.2
WNW-10	5.3 ± 0.2		
		S/SSE-10	4.9 ± 0.2
W-2	5.4 ± 0.2		
W-5	5.2 ± 0.2	SSE-5	4.9 ± 0.2
W-10	5.1 ± 0.2	SSE-10	4.9 ± 0.2
WSW-2	5.1 ± 0.2	SE-1	4.7 ± 0.2
WSW-5	5.1 ± 0.2		
WSW-10	4.4 ± 0.2	H-32	5.4 ± 0.2

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/ m³)

Collection Date	H08	<u>H12</u>	<u>H14</u>	<u>H30</u>	<u>H34</u>
06-Jul-99	<0.01	<0.01	<0.01	<0.01	<0.01
12-Jul-99	< 0.02	< 0.02	<0.02	<0.02	< 0.02
23-Jul-99	<0.01	<0.01	<0.01	<0.01	<0.01
29-Jul-99	<0.01	< 0.01	<0.01	<0.01	<0.01
04-Aug-99	<0.02	< 0.02	<0.02	<0.02	<0.02
11-Aug-99	<0.01	< 0.01	<0.02	<0.01	<0.01
16-Aug-99	< 0.03	< 0.03	<0.03	<0.03	<0.03
26-Aug-99	<0.01	< 0.01	(A)	<0.02	<0.01
31-Aug-99	<0.02	< 0.02	<0.05 (B)	<0.02	<0.02
08-Sep-99	<0.02	(C)	<1.29 (D)	<0.02	< 0.02
13-Sep-99	<0.02	< 0.03	<0.02	<0.03	<0.02
20-Sep-99	< 0.02	< 0.02	< 0.02	<0.03	< 0.02
27-Sep-99	<0.02	< 0.02	< 0.02	<0.02	< 0.02

(A) Pump motor froze up after extended power outage, no sample was collected

(B) Power outage, run time estimated at 16.8 hours
(C) Power outage and pump motor failure, no sample was collected.
(D) Power outage, run time estimated at 2.7 hours.

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

			Sample Site		
Collection Date	H08	H12	H14	H30	H34
06-Jul-99	0.008 ± 0.002	0.008 ± 0.002	0.008 ± 0.002	0.006 ± 0.002	0.008 ± 0.002
12-Jul-99	0.012 ± 0.002	0.015 ± 0.002	0.017 ± 0.002	0.009 ± 0.002	0.017 ± 0.002
23-Jul-99	0.012 ± 0.001	0.009 ± 0.001	0.014 ± 0.002	0.009 ± 0.001	0.013 ± 0.001
29-Jul-99	0.009 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	<0.006	0.010 ± 0.002
04-Aug-99	0.014 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.009 ± 0.002	0.011 ± 0.002
11-Aug-99	0.011 ± 0.002	0.007 ± 0.002	0.013 ± 0.002	0.010 ± 0.002	0.008 ± 0.002
16-Aug-99	0.008 ± 0.002	0.007 ± 0.002	0.008 ± 0.003	0.006 ± 0.002	0.009 ± 0.002
26-Aug-99	0.004 ± 0.001	0.005 ± 0.001	(A)	0.006 ± 0.002	0.005 ± 0.001
31-Aug-99	0.007 ± 0.002	<0.009	<0.009	<0.006	0.005 ± 0.002
08-Sep-99	0.011 ± 0.002	(B)	<0.3 (C)	0.008 ± 0.002	0.008 ± 0.002
13-Sep-99	0.011 ± 0.002	0.011 ± 0.003	0.010 ± 0.003	0.013 ± 0.003	0.012 ± 0.003
20-Sep-99	0.005 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.011 ± 0.002
27-Sep-99	0.007 ± 0.002	0.005 ± 0.002	0.007 ± 0.002	0.004 ± 0.002	0.007 ± 0.002
Mean:	0.009 ± 0.001	< 0.009	< 0.011	<0.008	0.010 ± 0.001

(A) pump motor froze up after extended power outage, no sample was collected

(B) Power outage and pump motor failure, no sample was collected.

(C) Power outage, run time estimated at 2.7 hours.

2.b.2. AIR PARTICULATES GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m3)

	Third Quarter, 1999											
Sample Site	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>							
H08	0.0812 ± 0.0079	<0.0195	<0.0007	<0.0007	0.0120 ± 0.0029							
H12	0.0649 ± 0.0075	<0.0224	<0.0008	< 0.0010	0.0178 ± 0.0035							
H14	0.0968 ± 0.0104	<0.0228	< 0.0014	<0.0008	0.0229 ± 0.0040							
H30	0.0603 ± 0.0082	<0.0157	<0.0007	<0.0006	0.0113 ± 0.0027							
H34	0.0717 ± 0.0083	<0.0091	<0.0007	<0.0008	0.0079 ± 0.0026							

r.

<u>3.a. SURFACE WATER - (pCi/L)</u>

Sample	Collection								Zr-95				Ba-140
<u>Site</u>	Date	<u>H-3</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Nb-95</u> (A)	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>La-140</u> (B)
H15	06-Jul-99	<146	288 ± 33	<3	<4	<7	<4	<8	<7	<4	<4	<3	<4
	12-Jul-99	<146	329 ± 30	<3	<3	<7	<4	<8	<5	<4	<4	<3	<7
	23-Jul-99	<142	354 ± 33	<3	<4	<6	<4	<8	<5	<5	<5	<4	<6
	29-Jul-99	<142	376 ± 30	<3	<3	<6	<4	<8	<6	<4	<3	<3	<9
	04-Aug-99	<148	376 ± 34	<3	<4	<8	<4	<8	<6	<4	<5	<4	<6
	11-Aug-99	<148	332 ± 35	<4	<4	<9	<4	<7	<6	<5	<5	<4	<7
	16-Aug-99 (C)	<148	337 ± 17	<2	<2	<3	<2	<4	<3	<2	<2	<2	<3
	25-Aug-99 (C)	<147	298 ± 31	<3	<4	<8	<4	<7	<6	<6	<3	<3	<4
	31-Aug-99	<147	364 ± 23	<2	<2	<4	<3	<6	<4	<2	<3	<2	<6
	08-Sep-99 (C)	<146	388 ± 34	<3	<3	<8	<4	<9	<7	<4	<4	<4	<5
	13-Sep-99 (C)	<146	368 ± 17	<1	<2	<3	<2	<4	<3	<2	<2	<2	<2
	20-Sep-99 (C)	<146	409 ± 35	<3	<4	<8	<4	<7	<6	<5	<4	<3	<5
	27-Sep-99	<146	321 ± 35	<4	<4	<7	<4	<9	<6	<4	<4	<4	<7
H59	07-Jul-99	<146	269 ± 35	<4	<3	<9	<4	<7	<7	<7	<3	<3	<6
	05-Aug-99	<148	408 ± 35	<3	<3	<8	<4	<5	<6	<6	<5	<4	<6
	27-Sep-99	<146	350 ± 34	<4	<4	<8	<5	<7	<6	<5	<4	<3	<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) - These samples were analyzed without the addition of acid..

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

Sample <u>Site</u>	Collection Date	<u>Be-7</u>	<u>K-40</u>	<u>Co-</u>	<u>58 C</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-21</u>	L <u>O</u>	<u>Ra-226</u>	<u>Th-232</u>	<u>U-238</u>
H15	05-Aug-99	<37	1433 ± 36	i <4	1	<4	<5	<4	615 ± 3	131 :	374 ± 5	177 ± 6	487 ± 88
H59	05-Aug-99	<79	501 ± 50	<7	7	<8	<10	<9	<664	4 3	804 ± 10	146 ± 12	<424
<u>4.a.1. CRU</u>	<u>STACEA - (pC</u>	li/kg, wet v	weight)										
Sample <u>Site</u>	Collection 	<u> </u>	<u>40 1</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-12</u>	<u>37 Ra</u>	-226	<u>Ra-228</u>
H15	08-Sep-99	475 ±	± 139	<27	<20	<46	<26	<40	<22	<19) <	465	<101
H59	05-Aug-99	2146 :	± 197	<21	<19	<36	<27	<40	<23	<22	2 <	452	<115
<u>4.a.2. FISH</u>	I - (pCi/kg, wet	weight)											
Sample <u>Site</u>	Collection <u>Date</u>	<u>K</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-1</u>	<u>37 Ra</u>	<u>a-226</u>	<u>Ra-228</u>
H15	05-Aug-99	3094	±217	<17	<18	<38	<25	<44	<17	<19) <	360	<64
H59	05-Aug-99	2805	± 300	<35	<32	<73	<42	<67	<37	<31	1 <	:609	<191

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

Sample Site	Collection Date	Be-7	K-40	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Pb-212</u>	<u>Ra-226</u>
H51	07-Jul-99	1404 ± 79	4000 ± 155	<17	<12	<11	<676	<29	<234
	04-Aug-99	462 ± 38	3403 ± 125	<9	<8	<10	<447	<22	<173
	09-Sep-99	643 ± 62	3021 ± 143	<12	<11	<12	<511	<34	<239
Н52	07-Jul-99	1162 ± 80	4239 ± 157	<14	<14	<13	<709	<29	<233
	04-Aug-99	609 ± 44	3623 ± 125	<8	<9	<8	<467	<25	<184
	09-Sep-99	647 ± 23	2788 ± 56	<4	<5	15 ± 2	<248	<12	<92
H59	07-Jul-99	757 ± 73	4621 ± 163	<17	<12	<13	<647	<31	<228
	05-Aug-99	628 ± 51	4459 ± 160	<11	<12	<11	<548	<32	<235
	09-Sep-99	675 ± 60	2569 ± 122	<9	<11	<11	<580	<26	<228



RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

FOURTH QUARTER 1999

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Technical Specifications Sampling

Fourth Quarter, 1999

Sample Type	Collection Frequency	Locations Sampled	Number of <u>Samples</u>
1. Direct Radiation	Quarterly	27	26
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Weekly	1	13
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	0	0
4. Ingestion			
4.a. Fish and Invertebrates			2
4.a.1. Crustacea	Semiannually	0	0
4.a.2. Fish	Semiannually	0	0
4.b. Food Products			
Broadleaf Vegetation	Monthly	3	9

Total: 181

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 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.

Sample Site	Deployment 13-Sep-99 Collection 14-Dec-99	SampleSite	Deployment 13-Sep-99 Collection 14-Dec-99
N-1	5.7 ± 0.2	SW-2	5.3 ± 0.2
		SW-5	7.1 ± 0.3
NNW-5	5.4 ± 0.2	SW-10	5.4 ± 0.2
NNW-10	5.9 ± 0.2		
		SSW-2	5.8 ± 0.2
NW-5	5.5 ± 0.2	SSW-5	5.9 ± 0.2
NW-10	7.2 ± 0.3	SSW-10	6.1 ± 0.2
WNW-2	5.5 ± 0.2	S-5	5.7 ± 0.2
WNW-5	5.7 ± 0.2	S-10	(A)
WNW-10	6.1 ± 0.2		
		S/SSE-10	5.4 ± 0.2
W-2	6.2 ± 0.2		
W-5	6.0 ± 0.2	SSE-5	5.1 ± 0.2
W-10	6.1 ± 0.2	SSE-10	5.6 ± 0.2
WSW-2	6.1 ± 0.2	SE-1	5.4 ± 0.2
WSW-5	6.0 ± 0.2		
WSW-10	4.8 ± 0.2	H-32	6.2 ± 0.2

1. DIRECT RADIATION - TLDs - (µR/hour)

(A) - Site S-10 TLD was missing upon collection attempt. A new TLD was deployed.

ST. LUCIE CORRECTED 1999 TLD RESULTS

FOURTH QUARTER

Sample Site	Deployment 13-Sep-99 Collection 14-Dec-99	Sample Site	Deployment 13-Sep-99 Collection 14-Dec-99
N-1	5.5 ± 0.2	SW-2	5.1 ± 0.2
		SW-5	6.8 ± 0.3
NNW-5	5.2 ± 0.2	SW-10	5.2 ± 0.2
NNW-10	5.6 ± 0.2		
		SSW-2	5.6 ± 0.2
NW-5	5.3 ± 0.2	SSW-5	5.7 ± 0.2
NW-10	6.9 ± 0.3	SSW-10	5.9 ± 0.2
WNW-2	5.3 ± 0.2	S-5	5.4 ± 0.2
WNW-5	5.5 ± 0.2	S-10	(A)
WNW-10	5.9 ± 0.2		
		S/SSE-10	5.2 ± 0.2
W-2	6.0 ± 0.2		
W-5	5.8 ± 0.2	SSE-5	4.9 ± 0.2
W-10	5.8 ± 0.2	SSE-10	5.4 ± 0.2
WSW-2	5.9 ± 0.2	SE-1	5.2 ± 0.2
WSW-5	5.8 ± 0.2		
WSW-10	4.6 ± 0.2	H-32	6.0 ± 0.2

(A) - Site S-10 TLD was missing upon collection attempt. A new TLD was deployed.

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/ m³)

Collection Date	H08	H12	H14	<u>H30</u>	H34
05-Oct-99	<0.02	<0.02	<0.02	< 0.02	< 0.02
11-Oct-99	<0.02	< 0.02	< 0.02	<0.02	< 0.02
18-Oct-99	<0.01	<0.01	<0.02	< 0.02	<0.01
26-Oct-99	<0.01	<0.01	<0.01	<0.01	<0.01
02-Nov-99	< 0.02	<0.02	< 0.02	< 0.02	<0.02
09-Nov-99	<0.03	<0.04	<0.03	<0.03	< 0.03
18-Nov-99	<0.02	< 0.02	<0.01	<0.02	< 0.02
22-Nov-99	<0.03	<0.03	<0.03	<0.03	< 0.03
02-Dec-99	<0.01	<0.01	<0.01	<0.01	< 0.01
07-Dec-99	<0.03	< 0.03	<0.03	<0.03	< 0.03
13-Dec-99	<0.03	< 0.02	< 0.02	<0.03	<0.02
21-Dec-99	<0.02	<0.02	<0.02	<0.02	< 0.03
28-Dec-99	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

.

				Sample Site		
_	Collection Date	H08	H12	<u> </u>	H30	<u> </u>
	05-Oct-99	0.006 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.007 ± 0.002	0.009 ± 0.002
	11-Oct-99	0.013 ± 0.002	0.012 ± 0.002	0.015 ± 0.002	0.008 ± 0.002	0.013 ± 0.002
	18-Oct-99	0.005 ± 0.002	0.006 ± 0.002	0.011 ± 0.003	<0.006	0.005 ± 0.002
	26-Oct-99	0.012 ± 0.002	0.011 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.014 ± 0.002
	02-Nov-99	0.014 ± 0.002	0.015 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.014 ± 0.002
	09-Nov-99	0.017 ± 0.002	0.016 ± 0.003	0.015 ± 0.002	0.015 ± 0.002	0.020 ± 0.002
	18-Nov-99	0.018 ± 0.002	0.022 ± 0.002	0.018 ± 0.002	0.012 ± 0.002	0.015 ± 0.002
	22-Nov-99	<0.009	0.014 ± 0.003	0.006 ± 0.003	<0.008	<0.009
	02-Dec-99	0.014 ± 0.002	0.011 ± 0.002	0.012 ± 0.002	0.009 ± 0.001	0.011 ± 0.002
	07-Dec-99	0.012 ± 0.003	0.012 ± 0.003	0.009 ± 0.002	0.009 ± 0.002	0.019 ± 0.003
	13-Dec-99	0.011 ± 0.002	0.012 ± 0.002	0.013 ± 0.002	0.006 ± 0.002	0.013 ± 0.002
	21-Dec-99	0.009 ± 0.002	0.013 ± 0.002	0.016 ± 0.002	0.010 ± 0.002	0.016 ± 0.002
	28-Dec-99	0.019 ± 0.002	0.019 ± 0.003	0.020 ± 0.002	0.012 ± 0.002	0.015 ± 0.002
	Mean:	<0.012	0.013 ± 0.001	0.013 ± 0.001	<0.010	<0.013

2.b.2. AIR PARTICULATES GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m3)

Fourth Quarter, 1999											
Sample Site	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>						
H08	0.1333 ± 0.0100	< 0.0202	<0.0006	<0.0008	0.0172 ± 0.0024						
H12	0.1334 ± 0.0094	<0.0169	<0.0009	<0.0009	0.0147 ± 0.0030						
H14	0.1588 ± 0.0100	<0.0151	<0.0008	<0.0008	0.0174 ± 0.0028						
H30	0.0974 ± 0.0082	<0.0183	<0.0010	< 0.0005	0.0131 ± 0.0020						
H34	0.1435 ± 0.0095	<0.0195	<0.0009	<0.0008	0.0118 ± 0.0031						

3.a. SURFACE WATER - (pCi/L)

Sample	Collection								Zr-95				Ba-140
Site	Date	<u>H-3</u>	<u>_K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	$\frac{\text{Nb-95}}{(4)}$	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	$\frac{\text{La-140}}{(B)}$
									(A)				(D)
H15	07-Oct-99	<142	329 ± 35	<3	<4	<6	<4	<9	<7	<4	<4	<4	<10
	11-Oct-99	<142	365 ± 36	<4	<3	<9	<5	<8	<6	<5	<4	<5	<6
	18-Oct-99	<142	312 ± 33	<4	<4	<7	<5	<8	<7	<4	<4	<4	<8
	26-Oct-99	<142	359 ± 33	<4	<4	<7	<5	<8	<6	<7	<4	<3	<6
	02-Nov-99	<142	374 ± 37	<3	<3	<6	<4	<10	<7	<4	<3	<4	<8
	09-Nov-99	<142	322 ± 30	<3	<4	<7	<4	<8	<8	<7	<4	<4	<3
	17-Nov-99	746 ± 32	320 ± 32	<4	<4	<7	<4	<9	<6	<6	<4	<4	<5
	22-Nov-99	<142	336 ± 16	<2	<2	<3	<2	<4	<3	<2	<2	<2	<4
	02-Dec-99	<137	406 ± 33	<3	<3	<8	<4	<7	<5	<5	<3	<4	<11
	07-Dec-99	<137	317 ± 37	<3	<3	<7	<5	<8	<6	<4	<3	<3	<11
	14-Dec-99	<141	363 ± 17	<2	<2	<4	<2	<3	<3	<2	<2	<2	<3
	21-Dec-99	<138	359 ± 33	<3	<4	<7	<5	<7	<8	<7	<4	<4	<6
	28-Dec-99	<143	328 ± 33	<4	<3	<8	<4	<6	<6	<4	<4	<4	<8
H59	07-Oct-99	<142	359 ± 36	<4	<3	<7	<5	<9	<7	<4	<3	<3	<9
	10-Nov-99	<142	275 ± 31	<4	<4	<10	<4	<8	<7	<8	<5	<4	<4
	07-Dec-99	<137	380 ± 37	<3	<4	<7	<4	<7	<7	<4	<4	<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.

.

.

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

Sample	Collection										
<u>Site</u>	Date	<u>Be-7</u>	<u>K-40</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>	<u>Th-232</u>	<u>U-238</u>
	These samp	oles were pr	eviously co	llected.							

<u>4.a.1. CRUSTACEA - (pCi/kg, wet weight)</u>

SampleCollectionSiteDateK-40Mn-54Co-58Fe-59Co-60Zn-65Cs-134Cs-137Ra-226Ra-228These samples were previously collected.

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

SampleCollectionSiteDateK-40Mn-54Co-58Fe-59Co-60Zn-65Cs-134Cs-137Ra-226Ra-228These samples were previously collected.

4.b. BROADLEAF VEGETATION - Brazilian Pepper - (pCJ/kg, wet weign	4.b.	BROADLEAF	VEGETATION -	Brazilian Pepper -	(pCi/kg,	wet weight
---	------	-----------	---------------------	--------------------	----------	------------

Sample Site	Collection Date	Be-7	<u>K-40</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Pb-212</u>	<u>Ra-226</u>
H51	05-Oct-99	842 ± 70	4269 ± 158	<18	<12	<14	<679	<32	<243
	10-Nov-99	500 ± 61	2767 ± 118	<19	<9	<10	<564	<27	<204
	07-Dec-99	1415 ± 76	4195 ± 154	<12	<9	<10	<640	<28	<240
H52	05-Oct-99	747 ± 61	5303 ± 188	<20	<11	<12	<714	<33	<260
	10-Nov-99	836 ± 32	4586 ± 75	<9	<5	<5	<280	<14	<100
	07-Dec-99	723 ± 64	5457 ± 165	<11	<10	<12	<602	<26	<218
H59	05-Oct-99	1865 ± 96	3721 ± 170	<22	<11	<15	<737	<36	<262
	10-Nov-99	602 ± 49	1945 ± 114	<19	<9	<8	<542	<29	<203
	07-Dec-99	1508 ± 85	2574 ± 132	<13	<14	<12	<799	<30	<264

ATTACHMENT C

RESULTS FROM THE INTERLABORATORY

COMPARISON PROGRAM 1999

.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT ST. LUCIE PLANT - UNITS 1 & 2

DOE-QAP 50 RESULTS

No. Test	Radionuclide	Reported Value	Reported Error	EML Value	EML Error	<u>Reported</u> EML	Evaluation
Matri	x: Al Air Filter Bq/fi	lter		0.404	0.004	4.047	
1	AM241	0.140	0.020	0.134	0.001	1.047	A
1	CO57	3.030	0.030	3.010	0.140	1.007	A
1	CO60	5.400	0.070	4.960	0.280	1.089	A
1	CS137	7.260	0.100	6.050	0.300	1.200	W
1	GROSS ALPHA	1.350	0.060	1.610	0.160	0.839	Α
1	GROSS BETA	1.650	0.060	1.560	0.160	1.058	Α
1	SB125	3.700	0.100	3.590	0.310	1.031	Α
Matri	ix: SO Soil Bq/kg	4 000	0.000	4 00 4	0.000	0.970	٨
1	AM214	4.300	0.600	4.894	0.969	0.079	A
1	CS137	616.000	2.000	659.500	24.950	0.934	A
1	K40	343.000	7.000	362.750	20.156	0.946	Α
1	U238	100.000	5.000	145.000	1.732	0.690	Α
Matri	ix: VE Vegetation I	Bq/kg					
1	AM241	4.000	0.700	3.522	0.589	1.136	Α
1	CO60	21.600	0.500	21.450	1.000	1.007	Α
1	CS137	472.000	2.000	467.000	20.000	1.011	Α
1	K40	657.000	10.000	656.500	20.000	1.001	Α
Matri	ix: WA Water Bq/I						
1	AM241	1.600	0.400	1.1460	0.050	1.396	W
1	CO60	53.300	0.500	51.100	3.000	1.043	Α
1	CS137	42.300	0.600	39.375	2.405	1.074	Α
1	GROSS ALPHA	1253.200	9.400	1090.000	20.000	1.150	Α
1	GROSS BETA	1233.500	7.500	1100.000	40.000	1.121	Α
1	H3	134.500	3.730	121.080	6.780	1.111	Α
1	NI63	91.720	1.040	114.000	10.000	0.805	Α

Evaluation : A = Acceptable, W = Acceptable with Warning, N = Not Acceptable

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT ST. LUCIE PLANT - UNITS 1 & 2

DOE-QAP 51 RESULTS

No.	Dediamonida	Reported	Reported	EML	EML	Reported	Evoluction
Test Radionucide Value Error Value Error Evil Evaluation Matrix: AL Air Filter Bo/filter							
1	AM241	0.160	0.020	0.127	0.010	1.260	А
1	CO57	8.740	0.040	7.730	0.033	1.131	W
1	CO60	7.330	0.060	6.350	0.410	1.154	W
1	CS137	8.400	0.080	6.430	0.420	1.306	W
1	GROSS ALPHA	2.570	0.090	2.770	0.260	0.928	Α
1	GROSS BETA	3.200	0.080	2.660	0.260	1.203	А
1	MN54	10.390	0.090	7.910	0.450	1.314	W
1	RU106	5.400	0.400	5.500	1.760	0.982	А
Matrix: SO Soil Ba/ka							
1	AC228	118.000	2.000	124.000	4.800	0.952	А
1	AM241	1.800	0.600	1,440	0.190	1.250	А
1	BI214	71.000	1.000	69.500	1.800	1.022	А
1	CS137	188.000	1.000	204.000	5.000	0.922	А
1	K40	748.000	10.000	780.000	27.000	0.959	А
1	PB212	113.700	2,200	127.000	4.800	0.895	W
1	PB214	222.000	3.00	72.000	0.420	3.083	Ν
1	U238	142.000	7.000	202.000	7.200	0.703	А
Matrix: VE Vegetation Ba/kg							
1	AM241	6.000	0.800	2.880	0.220	2.083	W
1	CO60	21.100	0.600	17.600	1.000	1.199	А
1	CS137	533.000	3.000	440.000	20.000	1.211	А
1	K40	615.000	10.000	513.000	20.000	1.199	Α
Matrix: WA Water Bo/I							
1	AM241	1.200	0.400	0.850	0.100	1.412	W
1	CO60	54.200	0.400	52.400	2.200	1.034	А
1	CS137	78.400	0.600	76.000	3.400	1.032	А
1	GROSS ALPHA	1655.400	8.300	1580.000	20.000	1.048	А
1	GROSS BETA	1008.400	4.500	740.000	40.000	1.363	W
1	H3	92.740	3.240	80.700	3.700	1.149	А

Evaluation : A = Acceptable, W = Acceptable with Warning, N = Not Acceptable