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MAY 11 2000

L-2000-075  
10 CFR 50.36b

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555-00001

Re: Turkey Point Units 3 and 4  
Docket Nos. 50-250 and 50-251  
1999 Annual Radiological  
Environmental Operating Report

Enclosed is the 1999 Annual Radiological Environmental Report for Turkey Point Units 3 and 4, as required by Technical Specification 6.9.1.3.

Should there be any questions or comments regarding this information, please contact us.

Very truly yours,

R. J. Hovey  
Vice President  
Turkey Point Plant

SM

Enclosure

cc: Regional Administrator, Region II, USNRC  
Senior Resident Inspector, USNRC, Turkey Point Plant

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1999

**ANNUAL  
RADIOLOGICAL ENVIRONMENTAL  
OPERATING REPORT**

**TURKEY POINT PLANT**

**UNITS 3 & 4**

**LICENSE NOS. DPR-31, DPR-41**

**DOCKET NOS. 50-250, 50-251**

Data Submitted by: Florida DOH

Prepared by: *Peter G. Ba*

Reviewed by: *J. H. Jones*

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**ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT  
TURKEY POINT PLANT – UNITS 3 & 4**

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TURKEY POINT PLANT – UNITS 3 & 4**

EXECUTIVE SUMMARY

The data obtained through the Turkey Point Radiological Environmental Monitoring Program verifies that the levels of radiation and concentrations of radioactive materials in environmental samples are not increasing. These measurements verify that the dose or dose commitment to members of the public, due to operation of Turkey Point Units 3 & 4, during the surveillance year, is well within the limits established by 10 CFR 50, Appendix I. The sampling period was from January 1, 1999 to December 31, 1999.

Additionally, supplemental samples collected by the State of Florida, DOH, do not indicate adverse trends in the radiological environment.

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TURKEY POINT PLANT – UNITS 3 & 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 described in the Offsite Dose Calculation Manual (ODCM) meeting the requirements of Unit 3 and Unit 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 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. Program Description

The Radiological Environmental Monitoring Program (REMP) for the Turkey Point Plant is conducted pursuant to Control 5.1 of Turkey Point Unit 3 & 4 ODCM.

1. Sample Locations, Types and Frequencies:

- a. Direct radiation gamma exposure rate is monitored continuously at 21 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 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.

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- 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.
- e. Fish and invertebrate samples are collected from 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 (DOH). Samples are collected and analyzed by DOH personnel.

Samples are analyzed at the DOH 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. Corrected 1999 TLD reading results were submitted by DOH and have been incorporated into the report at the end of each quarter in Attachment B (no page numbers).

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.

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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. See section III.8. for a discussion of the results.

III. DISCUSSION AND INTERPRETATION OF RESULTS

A. Reporting of Results

The Annual Radiological Environmental Operating Report contains the summaries, interpretations and information required by Control 1.4 of ODCM. Table 1 provides a summary of the measurements made for the nuclides required by ODCM Table 5.1-2, for all samples specified by Table 5.1-1. 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 self-assessment of the TLD processing methods was conducted February 4, 2000. This led to an improvement opportunity that was applied to the 1999 results. The 'corrected' results are within 10% of the original, and were used in the compilation of this report, see 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:

Results of gross beta measurement are consistent with past measurements. No radioiodine was detected. The only identified isotopes are cosmic-ray produced Be-7 and naturally occurring Pb-210 at levels consistent with past measurements.

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3. Waterborne, Surface Water:

The results of radioactivity measurements in surface water samples are consistent with past measurements. Tritium was reported as present in 6 of the 36 surface water samples collected. 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 is less than 10% of the required detection level specified by ODCM Table 5.1-3.

4. Waterborne, Sediment:

The results are consistent with past measurements. Only cosmic-ray produced Be-7 and naturally occurring isotopes were identified.

5. Waterborne, Food Products:

The results are consistent with past measurements; only naturally occurring radionuclides were detected.

6. Broad Leaf Vegetation

The results of radioactivity measurements are consistent with past measurements. Cs-137 was detected, as in the past, in samples collected from the indicator and control locations. The maximum concentration reported was less than 14% of the reporting level specified by ODCM Table 5.1-2. No other fission products were detected.

7. 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.

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8. Interlaboratory Comparison Program

In most cases, the results that were "acceptable with warning" 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.

Data for Pb-124 and Sr-90 are not included because these radionuclides are not required under the Radiological Environmental Monitoring Program.

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 increasing.

Additionally, supplemental to the ODCM program, sampling of the direct exposure, inhalation, and ingestion pathways, performed by DOH, does not show adverse trends in levels of radiation and radioactive materials in unrestricted areas. The measurements verify that the dose or dose commitment to members of the public, due to operation of Turkey Point Units 3 & 4, during the surveillance year, are well within "as low as reasonably achievable (ALARA)" criteria established by 10 CFR 50, Appendix I.

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY  
 Name of Facility Turkey Point Units 3 & 4, Docket No(s) 50-250 & 50-251  
 Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1999  
 (County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection <sup>a</sup> (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) <sup>b</sup> Range
			Name <sup>c</sup> Distance & Direction	Mean (f) <sup>b</sup> Range	
Exposure Rate, 86 <sup>d</sup>	---	5.6 (82/82) 4.3 - 8.8	NW-10 10 mi., NW	8.2 (4/4) 7.7 - 8.8	6.2 (4/4) 5.9 - 6.6

Number of Nonroutine Reported Measurements = 0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY  
 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251  
 Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1999  
 (County, State)

PATHWAY: AIRBORNE  
 SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES  
 UNITS: pCi/m<sup>3</sup>

Type and Total Number of Analyses Performed	Lower Limit of Detection <sup>a</sup> (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) <sup>b</sup> Range
			Name <sup>c</sup>	Mean (f) <sup>b</sup>	
			Distance & Direction	Range	
<sup>131</sup> I, 260	0.024	<MDA	---	---	<MDA
Gross Beta, 260	0.0025	0.012 (206/208) 0.005 - 0.035	T-72 <1 mi., WSW	0.012 (51/52) 0.005 - 0.024	0.012 (52/52) 0.005 - 0.023
Composite Gamma Isotopic, 20					
<sup>7</sup> Be	0.0052	0.1213 (16/16) 0.0764 - 0.1709	T-58 1 mi., NW	0.1357 (4/4) 0.0901 - 0.1709	0.1263 (4/4) 0.0839 - 0.1725
<sup>134</sup> Cs	0.00069	<MDA	---	---	<MDA
<sup>137</sup> Cs	0.00066	<MDA	---	---	<MDA
<sup>210</sup> Pb	---	0.0126 (16/16) 0.0086 - 0.0168	T-51 2 mi., NNW	0.0137 (4/4) 0.0101 - 0.0164	0.0113 (4/4) 0.0096 - 0.0125

Number of Nonroutine Reported Measurements = 0

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY  
 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251  
 Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1999  
 (County, State)

PATHWAY: WATERBORNE  
 SAMPLES COLLECTED: SURFACE WATER  
 UNITS: pCi/L

Type and Total Number of Analyses Performed	Lower Limit of Detection <sup>a</sup> (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) <sup>b</sup> Range
			Name <sup>c</sup> Distance & Direction	Mean (f) <sup>b</sup> Range	
Tritium, 36	230	228 (6/24) 173 - 286	T-81 6 mi., S	240 (4/24) 216 - 286	<MDA
Gamma Isotopic, 36					
<sup>40</sup> K	60	281 (24/24) 174 - 374	T-81 6 mi., S	287 (12/12) 174 - 354	225 (12/12) 96 - 338
<sup>54</sup> Mn	4	<MDA	---	---	<MDA
<sup>59</sup> Fe	8	<MDA	---	---	<MDA
<sup>58</sup> Co	4	<MDA	---	---	<MDA
<sup>60</sup> Co	4	<MDA	---	---	<MDA
<sup>65</sup> Zn	8	<MDA	---	---	<MDA
<sup>95</sup> Zr-Nb	7	<MDA	---	---	<MDA
<sup>131</sup> I	5	<MDA	---	---	<MDA
<sup>134</sup> Cs	5	<MDA	---	---	<MDA
<sup>137</sup> Cs	5	<MDA	---	---	<MDA
<sup>140</sup> Ba-La	11	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY  
 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251  
 Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1999  
 (County, State)

PATHWAY: WATERBORNE  
 SAMPLES COLLECTED: SHORELINE SEDIMENT  
 UNITS: pCi/kg, DRY

Type and Total Number of Analyses Performed	Lower Limit of Detection <sup>a</sup> (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) <sup>b</sup> Range
			Name <sup>c</sup>	Mean (f) <sup>b</sup>	
			Distance & Direction	Range	
Gamma Isotopic, 6					
<sup>7</sup> Be	100	272 (2/4) 237 - 307	T-81 6 mi., S	272 (2/2) 237 - 307	<MDA
<sup>40</sup> K	140	424 (3/4) 307 - 594	T-42 <1 mi., ENE	594 (1/2)	240 (2/2) 217 - 264
<sup>210</sup> Pb	---	835 (1/4)	T-42 <1 mi., ENE	835 (1/2)	<MDA
<sup>226</sup> Ra	49	707 (4/4) 548 - 839	T-42 <1 mi., ENE	746 (2/2) 652 - 839	<MDA
<sup>238</sup> U	---	544 (1/4)	T-42 <1 mi., ENE	544 (1/2)	<MDA
<sup>58</sup> Co	9	<MDA	---	---	<MDA
<sup>60</sup> Co	12	<MDA	---	---	<MDA
<sup>134</sup> Cs	14	<MDA	---	---	<MDA
<sup>137</sup> Cs	12	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY  
 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251  
 Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1999  
 (County, State)

PATHWAY: INGESTION  
 SAMPLES COLLECTED: CRUSTACEA  
 UNITS: pCi/kg, WET

Type and Total Number of Analyses Performed	Lower Limit of Detection <sup>a</sup> (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) <sup>b</sup> Range
			Name <sup>c</sup> Distance & Direction	Mean (f) <sup>b</sup> Range	
Gamma Isotopic, 4					
<sup>40</sup> K	130	1292 (2/2) 1191 - 1392	T-81 6 mi., S	1292 (2/2) 1191 - 1392	1655 (2/2) 1604 - 1706
<sup>226</sup> Ra	20	1001 (2/2) 946 - 1056	T-81 6 mi., S	1001 (2/2) 946 - 1056	<MDA
<sup>228</sup> Ra	---	<MDA	---	---	<MDA
<sup>54</sup> Mn	9	<MDA	---	---	<MDA
<sup>59</sup> Fe	16	<MDA	---	---	<MDA
<sup>58</sup> Co	9	<MDA	---	---	<MDA
<sup>60</sup> Co	19	<MDA	---	---	<MDA
<sup>65</sup> Zn	17	<MDA	---	---	<MDA
<sup>134</sup> Cs	9	<MDA	---	---	<MDA
<sup>137</sup> Cs	9	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY  
 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251  
 Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1999  
 (County, State)

PATHWAY: INGESTION  
 SAMPLES COLLECTED: FISH  
 UNITS: pCi/kg, WET

Type and Total Number of Analyses Performed	Lower Limit of Detection <sup>a</sup> (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) <sup>b</sup> Range
			Name <sup>c</sup> Distance & Direction	Mean (f) <sup>b</sup> Range	
Gamma Isotopic, 4					
<sup>7</sup> Be	---	<MDA	---	---	<MDA
<sup>40</sup> K	130	2028 (2/2) 1715 - 2341	T-81 6 mi., S	2028 (2/2) 1715 - 2341	2743 (2/2) 2428 - 3058
<sup>210</sup> Pb	---	<MDA	---	---	<MDA
<sup>226</sup> Ra	---	1180 (2/2) 968 - 1391	T-81 6 mi., S	1180 (2/2) 968 - 1391	<MDA
<sup>54</sup> Mn	9	<MDA	---	---	<MDA
<sup>59</sup> Fe	16	<MDA	---	---	<MDA
<sup>58</sup> Co	9	<MDA	---	---	<MDA
<sup>60</sup> Co	10	<MDA	---	---	<MDA
<sup>65</sup> Zn	17	<MDA	---	---	<MDA
<sup>134</sup> Cs	9	<MDA	---	---	<MDA
<sup>137</sup> Cs	9	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY  
 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251  
 Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1999  
 (County, State)

PATHWAY: INGESTION

SAMPLES COLLECTED: BROAD LEAF VEGETATION

UNITS: pCi/kg, WET

Type and Total Number of Analyses Performed	Lower Limit of Detection <sup>a</sup> (LLD)	All Indicator Locations Mean (f)Range	Location with Highest Annual Mean		Control Locations Mean (f) <sup>b</sup> Range
			Name <sup>c</sup> Distance & Direction	Mean (f) <sup>b</sup> Range	
Gamma Isotopic, 36					
<sup>7</sup> Be	71	1455 (24/24) 465 - 3095	T-40 3 mi., W	1586 (12/12) 465 - 2207	1093 (12/12) 657 - 1870
<sup>40</sup> K	100	3201 (24/24) 2082 - 5489	T-41 2 mi., W/NW	3575 (12/12) 2447 - 5489	3384 (12/12) 3333 - 5814
<sup>58</sup> Co	9	<MDA	---	---	<MDA
<sup>60</sup> Co	10	<MDA	---	---	<MDA
<sup>131</sup> I	9	<MDA	---	---	<MDA
<sup>134</sup> Cs	8	<MDA	---	---	<MDA
<sup>137</sup> Cs	8	99 (24/24) 29 - 260	T-41 2 mi., W/NW	139 (12/12) 35 - 260	28 (5/12) 17 - 40
<sup>210</sup> Pb	---	640 (2/24) 389 - 892	T-41 2 mi., W/NW	892 (1/12)	648 (2/12) 597 - 698
<sup>226</sup> Ra	---	133 (1/4)	T-40 3 mi., W	133 (1-4)	<MDA

Number of Nonroutine Reported Measurements = 0

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251

Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1999  
(County, State)

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.

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.

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TABLE 1A

DEVIATIONS / MISSING DATA

- |    |                         |  |
|----|-------------------------|--|
| A) | Pathway:                | Direct Exposure                              |
|    | Location:               | SSW-10, 10 miles SSW                         |
|    | Dates:                  | 12/16/98 to 03/24/99                         |
|    | Deviation:              | Failure to provide continuous monitoring.    |
|    | Description of Problem: | TLD's missing when collection was attempted. |
|    | Corrective Action:      | Replaced missing TLD.                        |
|    |                         |  |
| B) | Pathway:                | Direct Exposure                              |
|    | Locations:              | SSW-5, 5 miles SSW                           |
|    | Dates:                  | 09/22/99 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.                        |

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TABLE 1B

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

The values specified in ODCM Table 5.1-3, Detection Capabilities, were achieved for all samples.

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TABLE 2

LAND USE CENSUS  
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Distance to Nearest (a, b)

Sector	8/99 Milk (c) Animal	8/99 Residence	8/99 Garden (d)
N	L (e)	2.0/357	L
NNE	O (f)	O	O
NE	O	O	O
ENE	O	O	O
E	O	O	O
ESE	O	O	O
SE	O	O	O
SSE	O	O	O
S	L	L	L
SSW	L	L	L
SW	L	L	L
WSW	L	L	L
W	L	L	L
WNW	L	L	L
NW	L	3.6/306	4.4/306
NNW	L	4.4/337 (g)	4.5/332

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TABLE 2

LAND USE CENSUS  
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NOTES

- 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 2.0 miles bearing 357 degrees is recorded as 2.0/357.

- 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 predominantly a land area unoccupied by the category type.
- f. O denotes that the sector area is predominantly an ocean area.
- g. Non-residential occupied buildings in these sectors include the following:

<u>Sector</u>	<u>Distance</u>	<u>Description</u>
N	1.9/351	24-hour Security Staff Building
NNW	2.0/349	Security booth at park entrance

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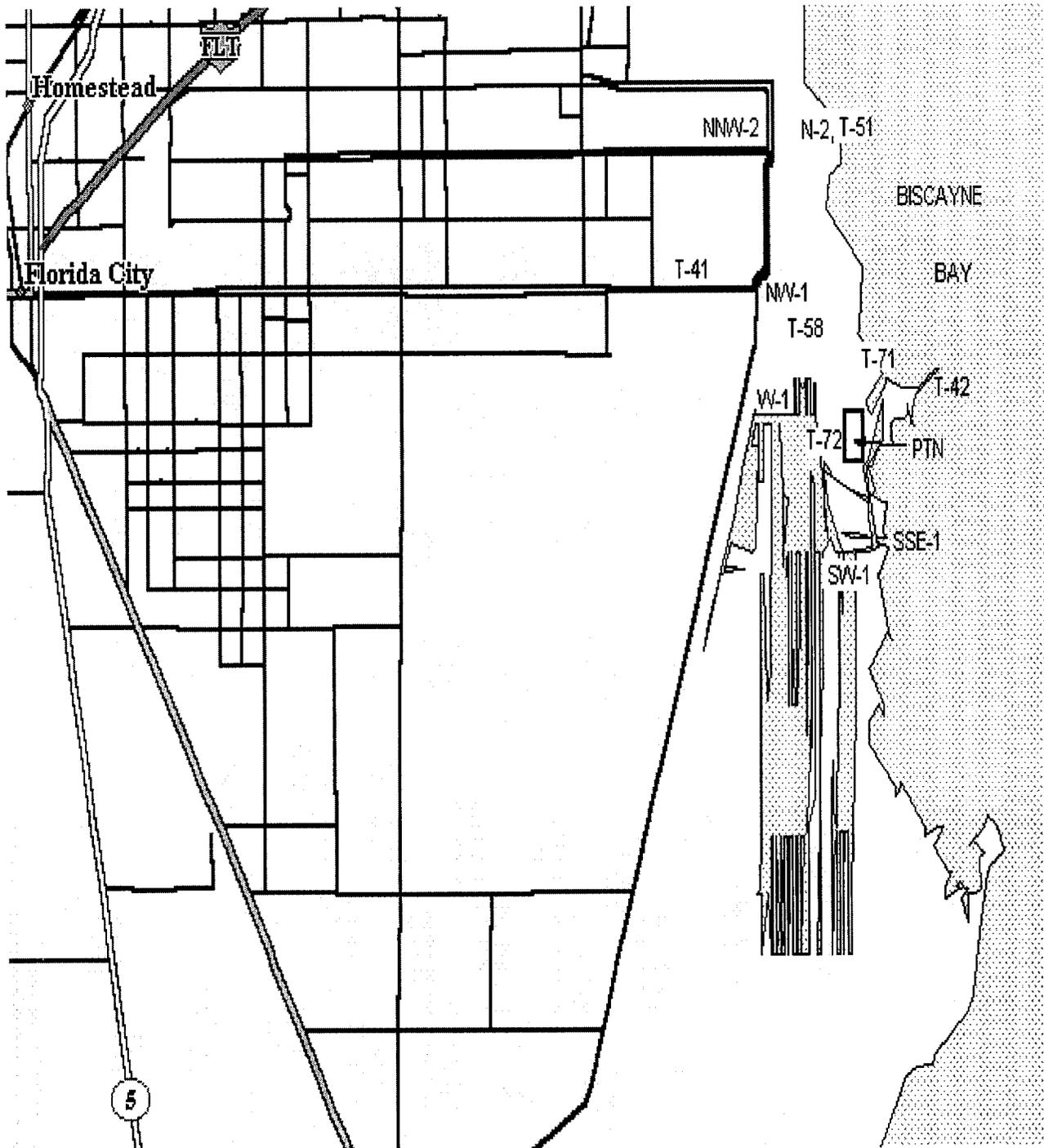
ATTACHMENT A

KEY TO SAMPLE LOCATIONS

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NEAR SITE SAMPLING LOCATIONS

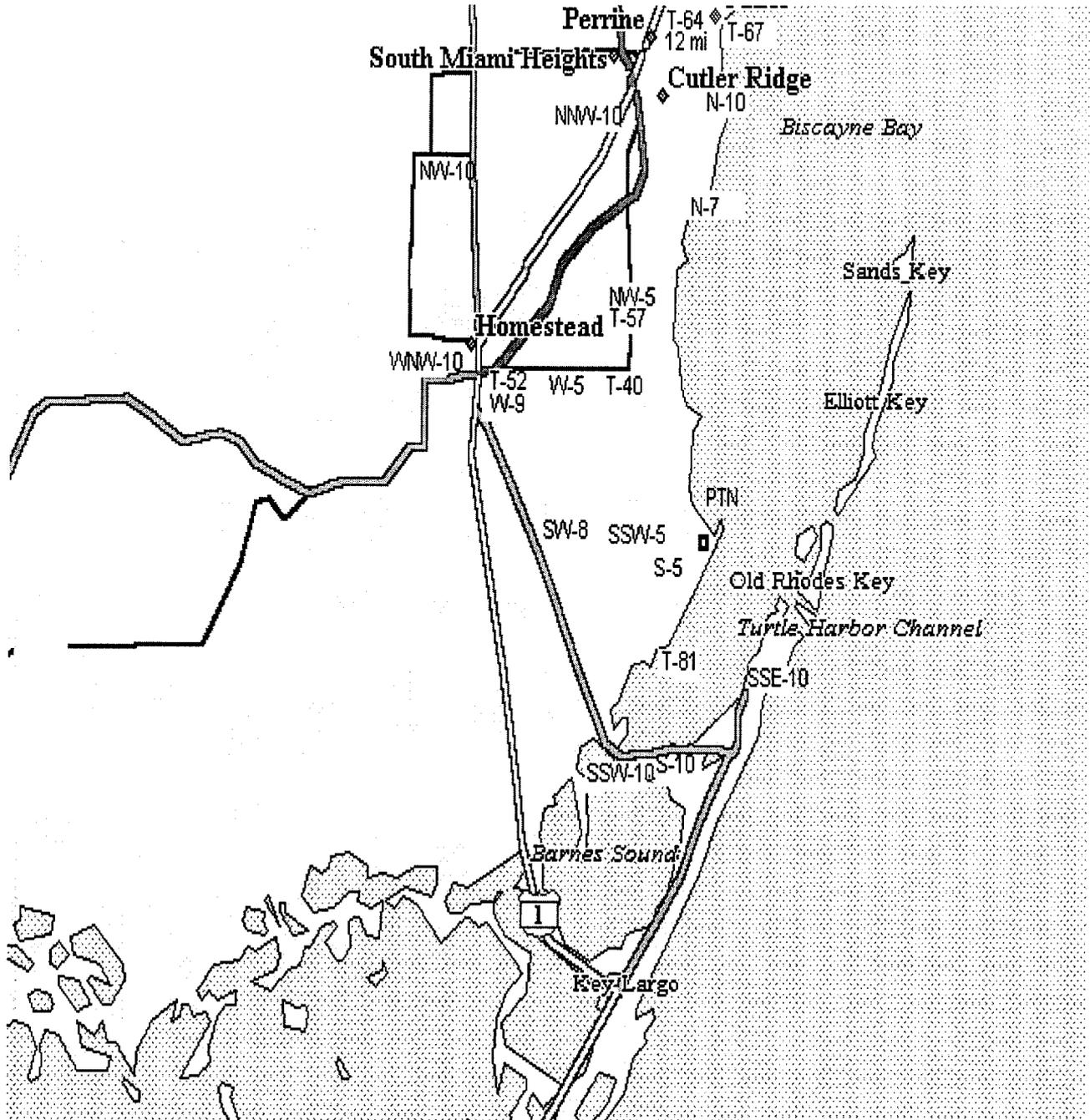
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DISTANT REMP SAMPLING LOCATIONS

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ATTACHMENT A

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

<u>Location</u> <sup>(a)</sup> <u>Name</u>	<u>Description</u>
N-2	Convey Point, Parking Area
N-7	Black Point Marina Parking Lot
N-10	Old Cutler Rd. approx. 196th Street
NNW-2	East End North Canal Road
NNW-10	Bailes Road & U.S. #1
NW-1	Turkey Point Entrance Road
NW-5	Mowry Drive & 117th Avenue
NW-10	Newton Road, North of Coconut Palm Drive
WNW-10	Homestead Middle School
W-1	On-Site, North Side of Discharge Canal
W-5	Palm Drive & Tallahassee Road
W-9	Card Sound Road, 0.6 mile from U.S. #1
WSW-8	Card Sound Road, 3.4 miles from U.S. #1
SW-1	On-Site near Land Utilization Offices
SW-8	Card Sound Road, 5 miles from U.S. #1
SSW-5	On-Site, Southwest Corner of Cooling Canals
SSW-10	Card Sound Road, west side of Toll Plaza
S-5	On-Site, South East Corner of Coding Canals
S-10	Card Sound Road at Steamboat Creek
SSE-1	Turtle Point
SSE-10	Ocean Reef
<u>Control</u>	
NNE-22	Natoma Substation

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<sup>a</sup>The location name is the direction sector - approximate distance (miles)

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PATHWAY: AIRBORNE

SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES

SAMPLE COLLECTION FREQUENCY: WEEKLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-51	NNW	2	Entrance Area to Biscayne National Park
T-57	NW	4	SW 107th Avenue at Mowry Canal
T-58	NW	1	Turkey Point Entrance Road
T-72	WSW	<1	Just before entrance to Land Utilization's access gate.
<u>Control:</u>			
T-64	NNE	22	Natoma Substation

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PATHWAY: WATERBORNE  
SAMPLES COLLECTED: SURFACE WATER (OCEAN)  
SAMPLE COLLECTION FREQUENCY: MONTHLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-42	ENE	<1	Biscayne Bay at Turkey Point
T-81	S	6	Card Sound, near Mouth of Old Discharge Canal

Control:

T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Plant, North to Matheson Hammock Park
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SAMPLES COLLECTED: SHORELINE SEDIMENT  
SAMPLE COLLECTION FREQUENCY: SEMI-ANNUALLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-42	ENE	<1	Biscayne Bay at Turkey Point
T-81	S	6	Card Sound, near Mouth of Old Discharge Canal

Control:

T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Plant, North to Matheson Hammock Park
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PATHWAY: INGESTION

SAMPLES COLLECTED: CRUSTACEA AND FISH

SAMPLE COLLECTION FREQUENCY: SEMI-ANNUALLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-81	S	6	Card Sound Vicinity of Turkey Point Facility
<u>Control:</u>			
T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Plant, North to Matheson Hammock Park

SAMPLES COLLECTED: BROAD LEAF VEGETATION

SAMPLE COLLECTION FREQUENCY: MONTHLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-40	W	3	South of Palm Dr. on S.W. 117th Street Extension
T-41	WNW	2	Palm Dr., West of Old Missile Site near Plant Site Boundary
<u>Control:</u>			
T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Plant, North to Matheson Hammock Park

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ATTACHMENT B

RADIOLOGICAL SURVEILLANCE OF  
FLORIDA POWER AND LIGHT COMPANY'S

TURKEY POINT SITE

1999

First Quarter, 1999

Second Quarter, 1999

Third Quarter, 1999

Fourth Quarter, 1999



RADIOLOGICAL SURVEILLANCE  
OF  
FLORIDA POWER AND LIGHT COMPANY  
TURKEY POINT SITE  
FIRST QUARTER 1999  
BUREAU OF RADIATION CONTROL

## TURKEY POINT SITE

## Technical Specifications Sampling

First Quarter, 1999

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	22	21
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
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			
Broadleaf Vegetation	Monthly	3	9
			Total: 176

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.

1. DIRECT RADIATION - TLDs - ( $\mu$ R/hour)

<u>Sample Site</u>	<u>Deployment 16-Dec-98 Collection 24-Mar-99</u>	<u>Sample Site</u>	<u>Deployment 16-Dec-98 Collection 24-Mar-99</u>
N-2	$5.7 \pm 0.2$	WSW-8	$5.9 \pm 0.2$ (A)
N-7	$4.9 \pm 0.2$		
N-10	$5.0 \pm 0.2$	SW-1	$5.1 \pm 0.2$
		SW-8	$4.8 \pm 0.2$
NNW-2	$4.5 \pm 0.2$		
NNW-10	$5.6 \pm 0.2$	SSW-5	$5.1 \pm 0.2$
		SSW-10	(B)
NW-1	$6.8 \pm 0.3$		
NW-5	$4.5 \pm 0.2$	S-5	$4.9 \pm 0.2$
NW-10	$8.2 \pm 0.3$	S-10	$5.9 \pm 0.2$
WNW-10	$6.5 \pm 0.2$	SSE-1	$5.0 \pm 0.2$
		SSE-10	$6.1 \pm 0.2$
W-1	$6.8 \pm 0.3$		
W-5	$5.5 \pm 0.2$	NNE-22	$6.3 \pm 0.2$
W-9	$5.0 \pm 0.2$		

(A) - The dosimeter for site WSW-8 was found on the ground when collection was attempted. We suspect wind blew the TLD cage off the utility pole. The TLD cage was remounted on the utility pole and a new dosimeter was deployed.

(B) - The dosimeter for site SSW-10 was missing when collection was attempted. A new dosimeter was deployed.

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m<sup>3</sup>)

<u>Collection Date</u>	<u>T51</u>	<u>T57</u>	<u>T58</u>	<u>T64</u>	<u>T72</u>
04-Jan-99	<0.02	<0.02	<0.02	<0.02	<0.02
11-Jan-99	<0.03	<0.03	<0.03	<0.02	<0.03
19-Jan-99	<0.02	<0.02	<0.02	<0.02	<0.02
25-Jan-99	<0.03	<0.03	<0.03	<0.03	<0.03
01-Feb-99	<0.02	<0.02	<0.02	<0.02	<0.02
08-Feb-99	<0.02	<0.02	<0.02	<0.02	<0.02
15-Feb-99	<0.02	<0.02	<0.02	<0.02	<0.02
23-Feb-99	<0.01	<0.01	<0.01	<0.01	<0.01
05-Mar-99	<0.01	<0.01	<0.01	<0.02	<0.01
10-Mar-99	<0.03	<0.03	<0.03	<0.02	<0.03
15-Mar-99	<0.04	<0.04	<0.04	<0.04	<0.04
22-Mar-99	<0.02	<0.02	<0.02	<0.02	<0.02
29-Mar-99	<0.02	<0.02	<0.02	<0.02	<0.02

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m<sup>3</sup>)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
04-Jan-99	0.009 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	<0.004
11-Jan-99	0.009 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.014 ± 0.002	0.010 ± 0.002
19-Jan-99	0.010 ± 0.002	0.008 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.010 ± 0.002
25-Jan-99	0.007 ± 0.002	0.005 ± 0.002	0.006 ± 0.002	0.005 ± 0.002	0.010 ± 0.002
01-Feb-99	0.015 ± 0.002	0.015 ± 0.002	0.018 ± 0.002	0.015 ± 0.002	0.014 ± 0.002
08-Feb-99	0.008 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.014 ± 0.002	0.009 ± 0.002
15-Feb-99	0.013 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.014 ± 0.002	0.014 ± 0.002
23-Feb-99	0.011 ± 0.002	0.014 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.014 ± 0.002
05-Mar-99	0.015 ± 0.002	0.013 ± 0.002	0.017 ± 0.002	0.019 ± 0.002	0.016 ± 0.002
10-Mar-99	0.018 ± 0.003	0.015 ± 0.003	0.020 ± 0.003	0.013 ± 0.002	0.015 ± 0.003
15-Mar-99	0.019 ± 0.003	0.022 ± 0.003	0.026 ± 0.003	0.023 ± 0.003	0.024 ± 0.003
22-Mar-99	0.013 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.014 ± 0.002	0.016 ± 0.002
29-Mar-99	0.018 ± 0.002	0.017 ± 0.002	0.018 ± 0.002	0.019 ± 0.002	0.020 ± 0.002
Mean:	0.013 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	<0.014

2.b.2. AIR PARTICULATES GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m<sup>3</sup>)First Quarter, 1999

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
T51	0.1405 ± 0.0100	<0.0154	<0.0006	<0.0007	0.0164 ± 0.0029
T57	0.1502 ± 0.0114	<0.0154	<0.0010	<0.0007	0.0086 ± 0.0027
T58	0.1709 ± 0.0111	<0.0162	<0.0009	<0.0009	0.0103 ± 0.0027
T64	0.1725 ± 0.0118	<0.0142	<0.0009	<0.0008	0.0115 ± 0.0024
T72	0.1623 ± 0.0102	<0.0154	<0.0008	<0.0008	0.0141 ± 0.0027

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

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95	I-131	Cs-134	Cs-137	Ba-140 La-140
									(A)				(B)
T42	20-Jan-99	<153	249 ± 36	<3	<4	<7	<4	<7	<7	<8	<5	<4	<5
	02-Feb-99	173 ± 47	268 ± 33	<3	<3	<8	<5	<7	<7	<8	<4	<3	<5
	16-Mar-99	238 ± 48	280 ± 32	<4	<4	<8	<5	<9	<8	<10	<4	<4	<7
T67	20-Jan-99	<153	248 ± 13	<1	<2	<3	<2	<3	<3	<5	<2	<1	<2
	05-Feb-99	<144	178 ± 29	<3	<4	<6	<3	<8	<7	<7	<4	<4	<5
	18-Mar-99	<143	96 ± 31	<4	<4	<7	<4	<7	<7	<9	<3	<3	<8
T81	07-Jan-99	<144	239 ± 31	<4	<4	<10	<4	<9	<6	<10	<5	<4	<6
	03-Feb-99	286 ± 50	283 ± 31	<4	<4	<9	<4	<9	<7	<9	<4	<3	<4
	16-Mar-99	<143	302 ± 33	<4	<4	<7	<5	<10	<8	<9	<4	<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 Site	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>U-238</u>
T42	11-Jan-99	<118	594 ± 85	<13	<14	<13	<14	835 ± 270	839 ± 20	544 ± 173
T67	07-Jan-99	<80	264 ± 36	<6	<6	<8	<8	<819	<33	<299
T81	07-Jan-99	307 ± 76	370 ± 70	<10	<13	<12	<13	<538	787 ± 18	<370

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

Sample Site	Collection 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>
T67	28-Jan-99	1392 ± 175	<16	<18	<49	<24	<43	<18	<17	<354	<79
T81	22-Jan-99	1706 ± 177	<20	<23	<48	<26	<48	<22	<20	1056 ± 219	<110

4.a.2. FISH - Red Snapper, Stone Fish, Sheepshead, - (pCi/kg, wet weight)

Sample Site	Collection 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>
T67	29-Jan-99	2428 ± 227	<16	<19	<55	<21	<36	<18	<16	<312	<97
T81	28-Jan-99	1715 ± 185	<19	<21	<53	<18	<46	<27	<24	968 ± 181	<107

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

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>
T40	12-Jan-99	2207 ± 106	2082 ± 145	<18	<11	75 ± 12	<1050	<368
	05-Feb-99	1538 ± 37	2748 ± 63	<8	<5	41 ± 4	389 ± 117	133 ± 60
	18-Mar-99	1252 ± 84	2439 ± 135	<31	<13	34 ± 7	<808	<275
T41	12-Jan-99	1592 ± 89	4019 ± 170	<15	<13	213 ± 11	<817	<285
	05-Feb-99	968 ± 72	2688 ± 133	<20	<11	188 ± 10	<680	<274
	18-Mar-99	992 ± 88	3096 ± 159	<33	<14	88 ± 10	<814	<284
T67	12-Jan-99	1598 ± 88	4081 ± 159	<14	<12	<13	<828	<255
	05-Feb-99	1105 ± 81	5242 ± 184	<18	<14	34 ± 9	<742	<274
	18-Mar-99	786 ± 33	1712 ± 50	<13	<5	17 ± 2	597 ± 121	<114

TURKEY POINT CORRECTED 1999 TLD RESULTS

FIRST QUARTER

Sample Site	Deployment 16-Dec-98 Collection 24-Mar-99	Sample Site	Deployment 16-Dec-98 Collection 24-Mar-99
N-2	5.8 ± 0.2	W-9	5.2 ± 0.2
N-7	5.1 ± 0.2	WSW-8	6.1 ± 0.2 (A)
N-10	5.1 ± 0.2	SW-1	5.3 ± 0.2
NNW-2	4.7 ± 0.2	SW-8	4.9 ± 0.2
NNW-10	5.8 ± 0.2	SSW-5	5.2 ± 0.2
NW-1	7.0 ± 0.3	SSW-10	(B)
NW-5	4.6 ± 0.2	S-5	5.1 ± 0.2
NW-10	8.4 ± 0.3	S-10	6.0 ± 0.2
WNW-10	6.6 ± 0.2	SSE-1	5.1 ± 0.2
W-1	6.9 ± 0.3	SSE-10	6.3 ± 0.2
W-5	5.6 ± 0.2	NNE-22	6.5 ± 0.2

(A) - The dosimeter for site WSW-8 was found on the ground when collection was attempted. We suspect wind blew the TLD cage off the utility pole. The TLD cage was remounted on the utility pole and a new dosimeter was deployed.

(B) - The dosimeter for site SSW-10 was missing when collection was attempted. A new dosimeter was deployed.



RADIOLOGICAL SURVEILLANCE  
OF  
FLORIDA POWER AND LIGHT COMPANY  
TURKEY POINT SITE

SECOND QUARTER 1999

BUREAU OF RADIATION CONTROL

## TURKEY POINT SITE

## Technical Specifications Sampling

Second Quarter, 1999

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	22	22
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Monthly	3	9
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: 170

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.

1. DIRECT RADIATION - TLDs - ( $\mu\text{R}/\text{hour}$ )

Sample Site	Deployment 24-Mar-99 Collection 22-Jun-99	Sample Site	Deployment 24-Mar-99 Collection 22-Jun-99
N-2	5.5 $\pm$ 0.2	W-9	5.0 $\pm$ 0.2
N-7	4.9 $\pm$ 0.2	WSW-8	5.7 $\pm$ 0.2
N-10	4.9 $\pm$ 0.2	SW-1	4.6 $\pm$ 0.2
NNW-2	4.4 $\pm$ 0.2	SW-8	4.7 $\pm$ 0.2
NNW-10	5.4 $\pm$ 0.2	SSW-5	4.9 $\pm$ 0.2
NW-1	6.7 $\pm$ 0.3	SSW-10	4.9 $\pm$ 0.2
NW-5	4.2 $\pm$ 0.2	S-5	4.4 $\pm$ 0.2
NW-10	8.0 $\pm$ 0.3	S-10	5.7 $\pm$ 0.2
WNW-10	5.9 $\pm$ 0.2	SSE-1	4.5 $\pm$ 0.2
W-1	6.4 $\pm$ 0.2	SSE-10	5.6 $\pm$ 0.2
W-5	5.1 $\pm$ 0.2	NNE-22	5.9 $\pm$ 0.2

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - ( $\text{pCi}/\text{m}^3$ )

Collection Date	T51	T57	T58	T64	T72
05-Apr-99	<0.03	<0.02	<0.03	<0.03	<0.03
12-Apr-99	<0.02	<0.02	<0.02	<0.02	<0.02
19-Apr-99	<0.02	<0.02	<0.03	<0.02	<0.02
26-Apr-99	<0.02	<0.02	<0.03	<0.02	<0.02
06-May-99	<0.01	<0.01	<0.01	<0.01	<0.01
10-May-99	<0.03	<0.03	<0.03	<0.02	<0.03
17-May-99	<0.02	<0.02	<0.02	<0.02	<0.02
26-May-99	<0.01	<0.01	<0.01	<0.01	<0.01
04-Jun-99	<0.02	<0.02	<0.02	<0.02	<0.02
10-Jun-99	<0.03	<0.03	<0.04	<0.04	<0.04
15-Jun-99	<0.03	<0.03	<0.02	<0.02	<0.02
22-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/m<sup>3</sup>)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
05-Apr-99	0.017 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.017 ± 0.002	0.018 ± 0.002
12-Apr-99	0.014 ± 0.002	0.017 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.012 ± 0.002
19-Apr-99	0.018 ± 0.002	0.024 ± 0.002	0.035 ± 0.004	0.008 ± 0.002	0.020 ± 0.002
26-Apr-99	0.015 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.018 ± 0.002
06-May-99	0.006 ± 0.001	0.005 ± 0.001	0.007 ± 0.001	0.009 ± 0.001	0.005 ± 0.001
10-May-99	0.012 ± 0.003	0.009 ± 0.003	0.011 ± 0.003	0.010 ± 0.003	0.014 ± 0.003
17-May-99	0.014 ± 0.002	0.013 ± 0.002	0.010 ± 0.002	0.015 ± 0.002	0.016 ± 0.002
26-May-99	0.009 ± 0.002	0.011 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.014 ± 0.002
04-Jun-99	0.011 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.012 ± 0.002
10-Jun-99	0.005 ± 0.002	0.007 ± 0.002	0.005 ± 0.002	0.008 ± 0.002	0.005 ± 0.002
15-Jun-99	<0.007	0.011 ± 0.003	0.010 ± 0.002	0.010 ± 0.002	0.007 ± 0.002
22-Jun-99	0.010 ± 0.002	0.006 ± 0.002	0.011 ± 0.002	0.011 ± 0.002	0.012 ± 0.002
29-Jun-99	0.009 ± 0.001	0.010 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.009 ± 0.002
Mean:	<0.011	0.011 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.012 ± 0.001

2.b.2. AIR PARTICULATES GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m<sup>3</sup>)Second Quarter, 1999

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
T51	0.1293 ± 0.0091	<0.0161	<0.0008	<0.0007	0.0135 ± 0.0028
T57	0.1006 ± 0.0079	<0.0165	<0.0007	<0.0006	0.0114 ± 0.0018
T58	0.1374 ± 0.0099	<0.0213	<0.0012	<0.0008	0.0108 ± 0.0027
T64	0.1298 ± 0.0101	<0.0160	<0.0007	<0.0006	0.0096 ± 0.0026
T72	0.1177 ± 0.0112	<0.0145	<0.0009	<0.0008	0.0119 ± 0.0037

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

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95	I-131	Cs-134	Cs-137	Ba-140 La-140
									(A)				(B)
T42	14-Apr-99	<147	374 ± 36	<3	<4	<8	<4	<7	<7	<7	<4	<3	<5
	13-May-99	<146	329 ± 37	<3	<4	<8	<4	<8	<7	<8	<4	<4	<5
	22-Jun-99	<147	196 ± 29	<3	<4	<5	<4	<7	<7	<5	<4	<4	<7
T67	15-Apr-99	<147	333 ± 40	<3	<4	<8	<4	<9	<7	<6	<4	<3	<4
	13-May-99	<146	338 ± 33	<4	<4	<10	<5	<8	<8	<8	<3	<4	<5
	22-Jun-99	<147	301 ± 33	<4	<3	<5	<5	<8	<7	<4	<4	<4	<8
T81	14-Apr-99	<147	174 ± 36	<3	<3	<7	<4	<8	<7	<6	<4	<5	<6
	13-May-99	<146	289 ± 34	<4	<3	<8	<4	<10	<7	<7	<5	<4	<4
	22-Jun-99	232 ± 49	340 ± 17	<2	<2	<3	<2	<4	<3	<2	<2	<2	<3

(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>	<u>Date</u>	<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>U-238</u>

These samples were previously collected.

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

Sample	Collection										
<u>Site</u>	<u>Date</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-137</u>	<u>Ra-226</u>	<u>Ra-228</u>

These samples were previously collected.

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

Sample	Collection										
<u>Site</u>	<u>Date</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-137</u>	<u>Ra-226</u>	<u>Ra-228</u>

These samples were previously collected.

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

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>
T40	15-Apr-99	465 ± 69	2618 ± 136	<20	<12	79 ± 8	<747	<268
	13-May-99	1375 ± 86	2446 ± 131	<20	<13	72 ± 8	<795	<296
	22-Jun-99	2161 ± 100	4551 ± 187	<13	<16	68 ± 9	<872	<328
T41	15-Apr-99	476 ± 51	2672 ± 117	<18	<10	260 ± 10	<563	<208
	13-May-99	1387 ± 82	2626 ± 119	<17	<9	126 ± 8	<654	<248
	22-Jun-99	951 ± 69	4822 ± 183	<11	<12	35 ± 7	<719	<263
T67	15-Apr-99	863 ± 69	2462 ± 122	<20	<12	19 ± 4	<721	<252
	13-May-99	789 ± 51	3143 ± 115	<14	<7	<7	<459	<181
	22-Jun-99	1374 ± 81	4468 ± 169	<13	<12	<10	<763	<266

## TURKEY POINT CORRECTED 1999 TLD RESULTS

## SECOND QUARTER

Sample Site	Deployment 24-Mar-99 Collection 22-Jun-99	Sample Site	Deployment 24-Mar-99 Collection 22-Jun-99
N-2	5.6 ± 0.2	W-9	5.0 ± 0.2
N-7	5.0 ± 0.2	WSW-8	5.7 ± 0.2
N-10	5.0 ± 0.2	SW-1	4.6 ± 0.2
NNW-2	4.4 ± 0.2	SW-8	4.8 ± 0.2
NNW-10	5.5 ± 0.2	SSW-5	4.9 ± 0.2
NW-1	6.8 ± 0.3	SSW-10	4.9 ± 0.2
NW-5	4.3 ± 0.2	S-5	4.4 ± 0.2
NW-10	8.1 ± 0.3	S-10	5.8 ± 0.2
WNW-10	6.0 ± 0.2	SSE-1	4.6 ± 0.2
W-1	6.5 ± 0.2	SSE-10	5.7 ± 0.2
W-5	5.2 ± 0.2	NNE-22	6.0 ± 0.2



RADIOLOGICAL SURVEILLANCE  
OF  
FLORIDA POWER AND LIGHT COMPANY  
TURKEY POINT SITE

THIRD QUARTER 1999

BUREAU OF RADIATION CONTROL

## TURKEY POINT SITE

## Technical Specifications Sampling

Third Quarter, 1999

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	22	22
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
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	1
4.a.2. Fish	Semiannually	2	0
4.b. Food Products			
Broadleaf Vegetation	Monthly	3	9

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 Total: 174

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.

1. DIRECT RADIATION - TLDs - ( $\mu\text{R}/\text{hour}$ )

<u>Sample Site</u>	<u>Deployment 22-Jun-99 Collection 22-Sep-99</u>	<u>Sample Site</u>	<u>Deployment 22-Jun-99 Collection 22-Sep-99</u>
N-2	$5.8 \pm 0.2$	WSW-8	$5.0 \pm 0.2$
N-7	$4.9 \pm 0.2$		
N-10	$5.5 \pm 0.2$	SW-1	$4.7 \pm 0.2$
		SW-8	$4.6 \pm 0.2$
NNW-2	$4.7 \pm 0.2$		
NNW-10	$5.7 \pm 0.2$	SSW-5	$4.5 \pm 0.2$
		SSW-10	$5.0 \pm 0.2$
NW-1	$6.6 \pm 0.3$		
NW-5	$4.7 \pm 0.2$	S-5	$4.7 \pm 0.2$
NW-10	$8.0 \pm 0.3$	S-10	$5.8 \pm 0.2$
WNW-10	$6.6 \pm 0.3$	SSE-1	$4.9 \pm 0.2$
		SSE-10	$6.0 \pm 0.2$
W-1	$6.8 \pm 0.3$		
W-5	$5.2 \pm 0.2$	NNE-22	$6.2 \pm 0.2$
W-9	$4.8 \pm 0.2$		

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m<sup>3</sup>)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
08-Jul-99	<0.02	<0.02	<0.02	<0.02	<0.02
14-Jul-99	<0.01	<0.02	<0.02	<0.01	<0.01
21-Jul-99	<0.02	<0.02	<0.03	<0.02	<0.03
27-Jul-99	<0.02	<0.02	<0.02	<0.02	<0.02
05-Aug-99	<0.01	<0.01	<0.01	<0.01	<0.01
10-Aug-99	<0.02	<0.02	<0.02	<0.02	<0.02
16-Aug-99	<0.02	<0.02	<0.02	<0.02	<0.02
24-Aug-99	<0.01	<0.02	<0.02	<0.02	<0.01
31-Aug-99	<0.01	<0.01	<0.01	<0.01	<0.01
07-Sep-99	<0.02	<0.02	<0.02	<0.02	<0.02
17-Sep-99	<0.02	<0.02	<0.02	<0.02	<0.02
22-Sep-99	<0.04	<0.04	<0.04	<0.04	<0.04
27-Sep-99	<0.02	<0.02	<0.02	<0.02	<0.02

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m<sup>3</sup>)

<u>Collection Date</u>	<u>Sample Site</u>				
	<u>T51</u>	<u>T57</u>	<u>T58</u>	<u>T64</u>	<u>T72</u>
08-Jul-99	0.013 ± 0.002	0.008 ± 0.002	0.007 ± 0.001	0.011 ± 0.002	0.011 ± 0.002
14-Jul-99	0.022 ± 0.002	0.018 ± 0.003	0.024 ± 0.003	0.023 ± 0.003	0.021 ± 0.003
21-Jul-99	0.012 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.011 ± 0.002	0.006 ± 0.002
27-Jul-99	0.011 ± 0.002	0.010 ± 0.002	0.015 ± 0.002	0.011 ± 0.002	0.018 ± 0.002
05-Aug-99	0.011 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.010 ± 0.002
10-Aug-99	0.013 ± 0.003	0.009 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.010 ± 0.002
16-Aug-99	0.008 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.015 ± 0.002	0.009 ± 0.002
24-Aug-99	0.006 ± 0.001	0.006 ± 0.001	0.005 ± 0.001	0.007 ± 0.001	0.007 ± 0.001
31-Aug-99	0.006 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.009 ± 0.002
07-Sep-99	0.009 ± 0.002	0.015 ± 0.002	0.010 ± 0.002	0.013 ± 0.002	0.011 ± 0.002
17-Sep-99	0.006 ± 0.001	0.008 ± 0.001	0.007 ± 0.001	0.011 ± 0.002	0.009 ± 0.001
22-Sep-99	0.007 ± 0.002	0.012 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.009 ± 0.002
27-Sep-99	0.008 ± 0.002	0.009 ± 0.002	0.015 ± 0.003	0.011 ± 0.003	0.007 ± 0.002
Mean:	0.010 ± 0.001	0.010 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.011 ± 0.001

2.b.2. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m<sup>3</sup>)Third Quarter, 1999

<u>Sample Site</u>	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
T51	0.0764 ± 0.0079	<0.0177	<0.0009	<0.0007	0.0146 ± 0.0029
T57	0.0889 ± 0.0082	<0.0149	<0.0007	<0.0008	0.0135 ± 0.0027
T58	0.0901 ± 0.0089	<0.0134	<0.0010	<0.0006	0.0152 ± 0.0026
T64	0.0839 ± 0.0079	<0.0173	<0.0008	<0.0009	0.0114 ± 0.0032
T72	0.0793 ± 0.0076	<0.0204	<0.0008	<0.0007	0.0168 ± 0.0024

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

<u>Sample Site</u>	<u>Collection Date</u>	<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>Zr-95 Nb-95</u> (A)	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ba-140 La-140</u> (B)
T42	14-Jul-99	<146	275 ± 34	<4	<4	<6	<4	<8	<8	<5	<5	<4	<5
	19-Aug-99	<148	335 ± 32	<3	<4	<8	<4	<8	<6	<7	<4	<4	<5
	20-Sep-99	<146	286 ± 31	<3	<3	<7	<5	<7	<6	<5	<4	<4	<5
T67	14-Jul-99	<146	218 ± 32	<3	<3	<7	<4	<8	<5	<4	<3	<4	<8
	19-Aug-99	<148	334 ± 31	<3	<3	<8	<4	<7	<8	<8	<4	<5	<4
	20-Sep-99	<146	172 ± 28	<4	<4	<8	<3	<7	<7	<7	<3	<4	<4
T81	14-Jul-99	224 ± 24	340 ± 36	<4	<4	<7	<4	<9	<6	<6	<5	<4	<4
	19-Aug-99	216 ± 49	354 ± 35	<3	<4	<8	<4	<6	<8	<7	<4	<4	<7
	20-Sep-99	<146	334 ± 31	<3	<4	<7	<4	<7	<7	<5	<4	<3	<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	<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>U-238</u>
T42	21-Sep-99	<118	<152	<10	<9	<10	<9	<803	652 ± 15	<504
T67	21-Sep-99	<82	217 ± 32	<6	<5	<6	<7	<451	<29	<261
T81	21-Sep-99	237 ± 45	307 ± 56	<10	<9	<10	<9	<867	548 ± 16	<507

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

Sample Site	Collection 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>
T67	01-Sep-99	1191 ± 181	<20	<31	<69	<29	<58	<26	<27	<424	<93
T81	This sample has not yet been collected.										

4.a.2. FISH – Mangrove Snapper, Bass, Perch - (pCi/kg, wet weight)

Sample Site	Collection 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>
T67	This sample has not yet been collected.										
T81	This sample has not yet been collected.										

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

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>
T40	14-Jul-99	1372 ± 80	3971 ± 162	<12	<12	108 ± 9	<852	<279
	19-Aug-99	1813 ± 95	2948 ± 133	<18	<11	67 ± 8	<659	<283
	20-Sep-99	1798 ± 87	2813 ± 141	<14	<13	55 ± 7	<731	<238
T41	14-Jul-99	790 ± 90	5489 ± 219	<15	<18	35 ± 8	<1084	<363
	19-Aug-99	3095 ± 122	4523 ± 182	<23	<13	149 ± 11	892 ± 264	<332
	20-Sep-99	2236 ± 107	3896 ± 184	<21	<12	136 ± 12	<890	<319
T67	14-Jul-99	1201 ± 90	5814 ± 197	<14	<15	<13	<771	<294
	19-Aug-99	1068 ± 75	2805 ± 127	<16	<12	31 ± 5	<644	<248
	20-Sep-99	1870 ± 83	2139 ± 112	<15	<9	<17	698 ± 264	<228

## TURKEY POINT CORRECTED 1999 TLD RESULTS

## THIRD QUARTER

Sample Site	Deployment 22-Jun-99 Collection 22-Sep-99	Sample Site	Deployment 22-Jun-99 Collection 22-Sep-99
N-2	5.5 ± 0.2	W-9	4.6 ± 0.2
N-7	4.7 ± 0.2	WSW-8	4.7 ± 0.2
N-10	5.3 ± 0.2	SW-1	4.4 ± 0.2
NNW-2	4.5 ± 0.2	SW-8	4.4 ± 0.2
NNW-10	5.4 ± 0.2	SSW-5	4.3 ± 0.2
NW-1	6.3 ± 0.3	SSW-10	4.8 ± 0.2
NW-5	4.5 ± 0.2	S-5	4.5 ± 0.2
NW-10	7.7 ± 0.3	S-10	5.5 ± 0.2
WNW-10	6.3 ± 0.3	SSE-1	4.7 ± 0.2
W-1	6.5 ± 0.3	SSE-10	5.8 ± 0.2
W-5	4.9 ± 0.2	NNE-22	5.9 ± 0.2



RADIOLOGICAL SURVEILLANCE  
OF  
FLORIDA POWER AND LIGHT COMPANY  
TURKEY POINT SITE

FOURTH QUARTER 1999

BUREAU OF RADIATION CONTROL

TURKEY POINT SITE  
 Technical Specifications Sampling  
 Fourth Quarter, 1999

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	22	21
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Monthly	3	9
3.b. Shoreline Sediment	Semiannually	0	0
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	1	1
4.a.2. Fish	Semiannually	2	2
4.b. Food Products			
Broadleaf Vegetation	Monthly	3	9
			Total: 172

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.

1. DIRECT RADIATION - TLDs - ( $\mu\text{R}/\text{hour}$ )

<u>Sample Site</u>	<u>Deployment 22-Sep-99 Collection 14-Dec-99</u>	<u>Sample Site</u>	<u>Deployment 22-Sep-99 Collection 14-Dec-99</u>
N-2	$6.8 \pm 0.3$	WSW-8	$6.1 \pm 0.2$
N-7	$5.9 \pm 0.2$		
N-10	$5.9 \pm 0.2$	SW-1	$5.7 \pm 0.2$
		SW-8	$5.3 \pm 0.2$
NNW-2	$5.3 \pm 0.2$		
NNW-10	$6.5 \pm 0.3$	SSW-5	(A)
		SSW-10	$6.0 \pm 0.2$
NW-1	$7.6 \pm 0.3$		
NW-5	$5.2 \pm 0.2$	S-5	$5.4 \pm 0.2$
NW-10	$9.1 \pm 0.3$	S-10	$6.7 \pm 0.3$
WNW-10	$7.3 \pm 0.3$	SSE-1	$5.5 \pm 0.2$
		SSE-10	$7.2 \pm 0.3$
W-1	$8.2 \pm 0.3$		
W-5	$6.3 \pm 0.2$	NNE-22	$6.9 \pm 0.3$
W-9	$5.4 \pm 0.2$		

(A) – Site SSW-5 TLD was missing upon collection attempt. A new TLD was deployed.

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m<sup>3</sup>)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
07-Oct-99	<0.01	<0.01	<0.01	<0.01	<0.01
12-Oct-99	<0.03	<0.03	<0.03	<0.03	<0.03
20-Oct-99	<0.02	<0.02	<0.02	<0.02	<0.02
25-Oct-99	<0.03	<0.03	<0.03	<0.03	<0.03
01-Nov-99	<0.02	<0.02	<0.02	<0.02	<0.02
08-Nov-99	<0.03	<0.03	<0.03	<0.03	<0.03
15-Nov-99	<0.02	<0.02	<0.02	<0.02	<0.02
22-Nov-99	<0.02	<0.02	<0.02	<0.02	<0.02
29-Nov-99	<0.02	<0.02	<0.02	<0.02	<0.02
09-Dec-99	<0.02	<0.02	<0.02	<0.02	<0.02
13-Dec-99	<0.04	<0.04	<0.04	<0.04	<0.04
21-Dec-99	<0.02	<0.02	<0.02	<0.02	<0.02
27-Dec-99	<0.02	<0.02	<0.02	<0.02	<0.02

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m<sup>3</sup>)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
07-Oct-99	0.007 ± 0.001	0.008 ± 0.001	0.007 ± 0.001	0.009 ± 0.001	0.009 ± 0.001
12-Oct-99	0.010 ± 0.003	0.008 ± 0.002	0.005 ± 0.002	0.011 ± 0.003	0.007 ± 0.002
20-Oct-99	0.006 ± 0.002	0.006 ± 0.001	0.006 ± 0.002	0.007 ± 0.002	0.006 ± 0.002
25-Oct-99	0.015 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.017 ± 0.003	0.017 ± 0.003
01-Nov-99	0.014 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.013 ± 0.002	0.012 ± 0.002
08-Nov-99	0.010 ± 0.002	0.011 ± 0.002	0.014 ± 0.002	0.012 ± 0.002	0.015 ± 0.002
15-Nov-99	0.016 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.018 ± 0.002	0.014 ± 0.002
22-Nov-99	0.015 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.019 ± 0.002	0.017 ± 0.002
29-Nov-99	0.006 ± 0.002	0.008 ± 0.002	0.008 ± 0.002	0.007 ± 0.002	0.010 ± 0.002
09-Dec-99	0.013 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.015 ± 0.002	0.013 ± 0.002
13-Dec-99	0.014 ± 0.003	0.010 ± 0.003	0.007 ± 0.003	0.012 ± 0.003	0.009 ± 0.003
21-Dec-99	0.012 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.010 ± 0.002
27-Dec-99	0.011 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.011 ± 0.002
Mean:	0.012 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.013 ± 0.001	0.012 ± 0.001

2.b.2. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m<sup>3</sup>)

Sample Site	Fourth Quarter, 1999				
	Be-7	K-40	Cs-134	Cs-137	Pb-210
T51	0.1158 ± 0.0091	<0.0205	<0.0007	<0.0009	0.0101 ± 0.0031
T57	0.1259 ± 0.0086	<0.0180	<0.0010	<0.0009	0.0137 ± 0.0034
T58	0.1442 ± 0.0105	<0.0168	<0.0009	<0.0007	0.0115 ± 0.0032
T64	0.1189 ± 0.0103	<0.0172	<0.0009	<0.0010	0.0125 ± 0.0033
T72	0.1152 ± 0.0091	<0.0178	<0.0009	<0.0007	0.0091 ± 0.0031

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

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95	I-131	Cs-134	Cs-137	Ba-140 <sup>*</sup> La-140
									(A)				(B)
T42	18-Oct-99	<142	222 ± 32	<3	<4	<8	<3	<6	<7	<9	<3	<4	<7
	09-Nov-99	<142	<44	<4	<3	<6	<4	<7	<7	<9	<4	<4	<8
	06-Dec-99	<139	206 ± 29	<4	<4	<8	<3	<9	<7	<13	<4	<4	<6
T67	22-Oct-99	<142	209 ± 26	<4	<3	<8	<4	<8	<6	<8	<4	<4	<7
	12-Nov-99	<142	125 ± 24	<3	<3	<7	<4	<8	<7	<8	<3	<4	<6
	10-Dec-99	<139	144 ± 23	<3	<4	<8	<4	<7	<6	<11	<4	<3	<5
T81	18-Oct-99	<142	241 ± 28	<4	<4	<7	<4	<7	<7	<9	<3	<4	<5
	09-Nov-99	<142	262 ± 29	<3	<4	<9	<3	<7	<6	<9	<4	<4	<6
	09-Dec-99	<142	286 ± 15	<2	<2	<4	<2	<4	<3	<5	<2	<2	<3

(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	<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>U-238</u>
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These samples were previously collected.

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

Sample Site	Collection 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>
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T67 This sample was previously collected.

T81	12-Oct 99	1604 ± 182	<22	<27	<55	<30	<50	<23	<24	946 ± 255	<104
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4.a.2. FISH - (pCi/kg, wet weight)

Sample Site	Collection 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>
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T67	13-Oct-99	3058 ± 206	<18	<20	<50	<26	<44	<17	<19	<338	<97
T81	11-Oct-99	2341 ± 212	<19	<28	<53	<26	<43	<27	<19	1391 ± 213	<136

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

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>
T40	22-Oct-99	2089 ± 48	2878 ± 75	<11	<7	37 ± 4	<392	<144
	12-Nov-99	1714 ± 112	2314 ± 147	<27	<13	44 ± 6	<945	<352
	09-Dec-99	1250 ± 83	2106 ± 125	<24	<12	29 ± 7	<875	<288
T41	22-Oct-99	1899 ± 94	3715 ± 176	<23	<13	74 ± 11	<753	<287
	12-Nov-99	712 ± 79	2855 ± 115	<18	<9	183 ± 8	<547	<199
	09-Dec-99	785 ± 60	2497 ± 111	<18	<10	178 ± 8	<622	<215
T67	22-Oct-99	657 ± 57	2745 ± 121	<16	<9	<12	<545	<189
	12-Nov-99	814 ± 60	3333 ± 133	<22	<10	<11	<540	<220
	10-Dec-99	995 ± 36	2635 ± 65	<9	<5	40 ± 3	<337	<117

TURKEY POINT CORRECTED 1999 TLD RESULTS

FOURTH QUARTER

<u>Sample Site</u>	<u>Deployment 22-Sep-99 Collection 14-Dec-99</u>	<u>Sample Site</u>	<u>Deployment 22-Sep-99 Collection 14-Dec-99</u>
N-2	6.5 ± 0.3	W-9	5.2 ± 0.2
N-7	5.7 ± 0.2	WSW-8	5.9 ± 0.2
N-10	5.7 ± 0.2	SW-1	5.5 ± 0.2
NNW-2	5.1 ± 0.2	SW-8	5.1 ± 0.2
NNW-10	6.3 ± 0.3	SSW-5	(A)
NW-1	7.3 ± 0.3	SSW-10	5.8 ± 0.2
NW-5	5.0 ± 0.2	S-5	5.2 ± 0.2
NW-10	8.8 ± 0.3	S-10	6.5 ± 0.3
WNW-10	7.1 ± 0.3	SSE-1	5.3 ± 0.2
W-1	7.9 ± 0.3	SSE-10	6.9 ± 0.3
W-5	6.0 ± 0.2	NNE-22	6.6 ± 0.3

(A) – Site SSW-5 TLD was missing upon collection attempt. A new TLD was deployed.

1999

**ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT  
TURKEY POINT PLANT – UNITS 3 & 4**

ATTACHMENT C

RESULTS FROM THE INTERLABORATORY  
COMPARISON PROGRAM 1999

## DOE-QAP 50 RESULTS

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No. Test	Radionuclide	Reported Value	Reported Error	EML Value	EML Error	Reported EML	Evaluation
<b>Matrix: AI Air Filter Bq/filter</b>							
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	A
1	GROSS BETA	1.650	0.060	1.560	0.160	1.058	A
1	SB125	3.700	0.100	3.590	0.310	1.031	A
<b>Matrix: SO Soil Bq/kg</b>							
1	AM214	4.300	0.600	4.894	0.969	0.879	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	A
1	U238	100.000	5.000	145.000	1.732	0.690	A
<b>Matrix: VE Vegetation Bq/kg</b>							
1	AM241	4.000	0.700	3.522	0.589	1.136	A
1	CO60	21.600	0.500	21.450	1.000	1.007	A
1	CS137	472.000	2.000	467.000	20.000	1.011	A
1	K40	657.000	10.000	656.500	20.000	1.001	A
<b>Matrix: WA Water Bq/l</b>							
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	A
1	CS137	42.300	0.600	39.375	2.405	1.074	A
1	GROSS ALPHA	1253.200	9.400	1090.000	20.000	1.150	A
1	GROSS BETA	1233.500	7.500	1100.000	40.000	1.121	A
1	H3	134.500	3.730	121.080	6.780	1.111	A
1	NI63	91.720	1.040	114.000	10.000	0.805	A

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

## DOE-QAP 51 RESULTS

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No. Test	Radionuclide	Reported Value	Reported Error	EML Value	EML Error	Reported EML	Evaluation
<b>Matrix: AI Air Filter Bq/filter</b>							
1	AM241	0.160	0.020	0.127	0.010	1.260	A
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	A
1	GROSS BETA	3.200	0.080	2.660	0.260	1.203	A
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	A
<b>Matrix: SO Soil Bq/kg</b>							
1	AC228	118.000	2.000	124.000	4.800	0.952	A
1	AM241	1.800	0.600	1.440	0.190	1.250	A
1	BI214	71.000	1.000	69.500	1.800	1.022	A
1	CS137	188.000	1.000	204.000	5.000	0.922	A
1	K40	748.000	10.000	780.000	27.000	0.959	A
1	PB212	113.700	2.200	127.000	4.800	0.895	W
1	U238	142.000	7.000	202.000	7.200	0.703	A
<b>Matrix: VE Vegetation Bq/kg</b>							
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	A
1	CS137	533.000	3.000	440.000	20.000	1.211	A
1	K40	615.000	10.000	513.000	20.000	1.199	A
<b>Matrix: WA Water Bq/l</b>							
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	A
1	CS137	78.400	0.600	76.000	3.400	1.032	A
1	GROSS ALPHA	1655.400	8.300	1580.000	20.000	1.048	A
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	A

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