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U. S. Nuclear Regulatory Commission
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Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
1993 Annual Radiological
Environmental Operating Report

Attached is the 1993 Annual Radiological Environmental Operating 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,

T. F. Plunkett
Vice President
Turkey Point Plant

TFP/RJT/rt

Attachment

cc: S. D. Ebneter, Regional Administrator, Region II, USNRC
T. P. Johnson, Sr. Resident Inspector, USNRC, Turkey Point Plant

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Miami Group

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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington DC 20555

24 February 00

RE: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Homestead AFB Property Disposal

We appreciate the considerations you have shown us during this process. As you likely realize, the conversion involving Homestead Air Force Base is very important to us and the base is very close to Turkey Point. We are extremely concerned about the public safety consequences of the conversion.

We understand that the Nuclear Regulatory Commission ("NRC") is completing a Safety Evaluation Report ("SER") for the Final Supplemental Environmental Impact Statement. Sierra Club, Miami Group, has notice that a significant amount of important information seems to be missing from the public record including the Draft Supplemental Environmental Impact Statement ("DSEIS"). We respectfully request that you ensure that the information below is incorporated into the calculations and conclusions of the SER.

1. The NRC staff, in a letter (ref. 2) to Florida Power & Light ("FP&L"), states that the probability calculations of aircraft hazards should comply with NUREG-0800 (ref. 3, p 3.5.1.6-3). FP&L's response (ref. 4 and ref. 7) utilizes formulae that appear to be inconsistent with NUREG-0800.

2. We realize that in complex calculations, assumptions can mislead and mistakes can be made. In a Memorandum and Order for the Big Rock Nuclear Power Plant (ref. 5), for example, a conceptual error was discovered in a probability analysis. This error led to a conclusion that underestimated a plane crash risk into the nuclear power plant by a factor of 23,667. We request that a line-by-line, calculation-by-calculation probability analysis of air crashes from Homestead Airport, Homestead Spaceport, and the Combined Spaceport/Airport alternative be included in the SER, as specified by NUREG-0800.

3. Aside from Mexico, Guatemala, and the northern Bahamas Islands, it appears that Homestead is the closest mainland American airport to all the countries of the Caribbean, Central America, and South America. The DSEIS (ref. 1, p 2.2-9) predicts significant foreign passenger and cargo operations by the year 2005. For 2015 (assuming FP&L receives a license renewal) the DSEIS (ref. 1 p 2.2-9 to 2.2-11) states:

> "Together, these commercial passenger server user groups are forecast to have 20,300 jet and 30,920 turboprop annual operations

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by 2015. Of these 51,220 operations, more than 80% are estimated to be Latin American, Caribbean, or other international locations."

In NUREG-0800 (ref. 3, p 3.5.1.6-4), the table for fatal crash probability only states data for US. Air Carriers, General Aviation, USN/USMC, and USAF. NUREG-0800 appears to be inadequate to calculate accident probabilities concerning large proportions of foreign aircraft operations. Please explain in the SER what data and calculations are being used to compensate for the disparity between the predicted Homestead foreign/domestic fleet mix and the general norm.

4. In the Turkey Point Final Safety Analysis Report (ref. 6, fig. 2.2-2, fig. 2.5-1, fig. 2.5-2), the relevant aerial photograph, maps, and diagrams appear to show that portions of Homestead Air Force Base lie within a 5 mile radius of the plant. How does this meet acceptance criteria II.1.a and II.1.b of NUREG-0800 (ref. 3, p 3.5.1.6-2)?

5. In an addendum to the DSEIS, on the flight path chart named "HST EAST FLOW," it appears that the following flight paths over fly Turkey Point:

1. helicopter arrivals EA1X,
2. backbone ND3X, and
3. backbone NDOX.

On the flight path chart named "HST WEST FLOW," it appears that the following flight path over flies Turkey Point:

4. backbone SD5X.

On the chart named "HST EXISTING & FUTURE LOCAL PATTERN TRACKS," it appears that the following patterns over fly Turkey Point:

5. NC8,
6. NC9, and
7. SC4.

On the flight path chart named "HST EAST FLOW-ARRIVALS," it appears that the following flight paths over fly Turkey Point:

8. backbone O5JJ,
9. backbone NDAX, and
10. backbone EA1X.

On the flight path chart named "HST EAST FLOW-DEPARTURES," it appears that the following flight paths over fly Turkey Point:

11. backbone O5WP, and
12. backbone O5WJ.

On the flight path chart named "HST WEST FLOW-ARRIVALS," it appears that the following flight paths over fly Turkey Point:

13. backbone 23FJ,
14. backbone 23RJ, and
15. backbone 23TP.

On the flight path chart named "HST WEST FLOW-DEPARTURES," it appears that the following flight paths over fly Turkey Point:

16. 23HJ,
17. 23HP,
18. 23WP,
19. 23WJ,

20. 23VJ,
21. 23SJ, and
22. WDIX.

How do these over flights meet acceptance criteria, II.1.c of NUREG-0800 ?

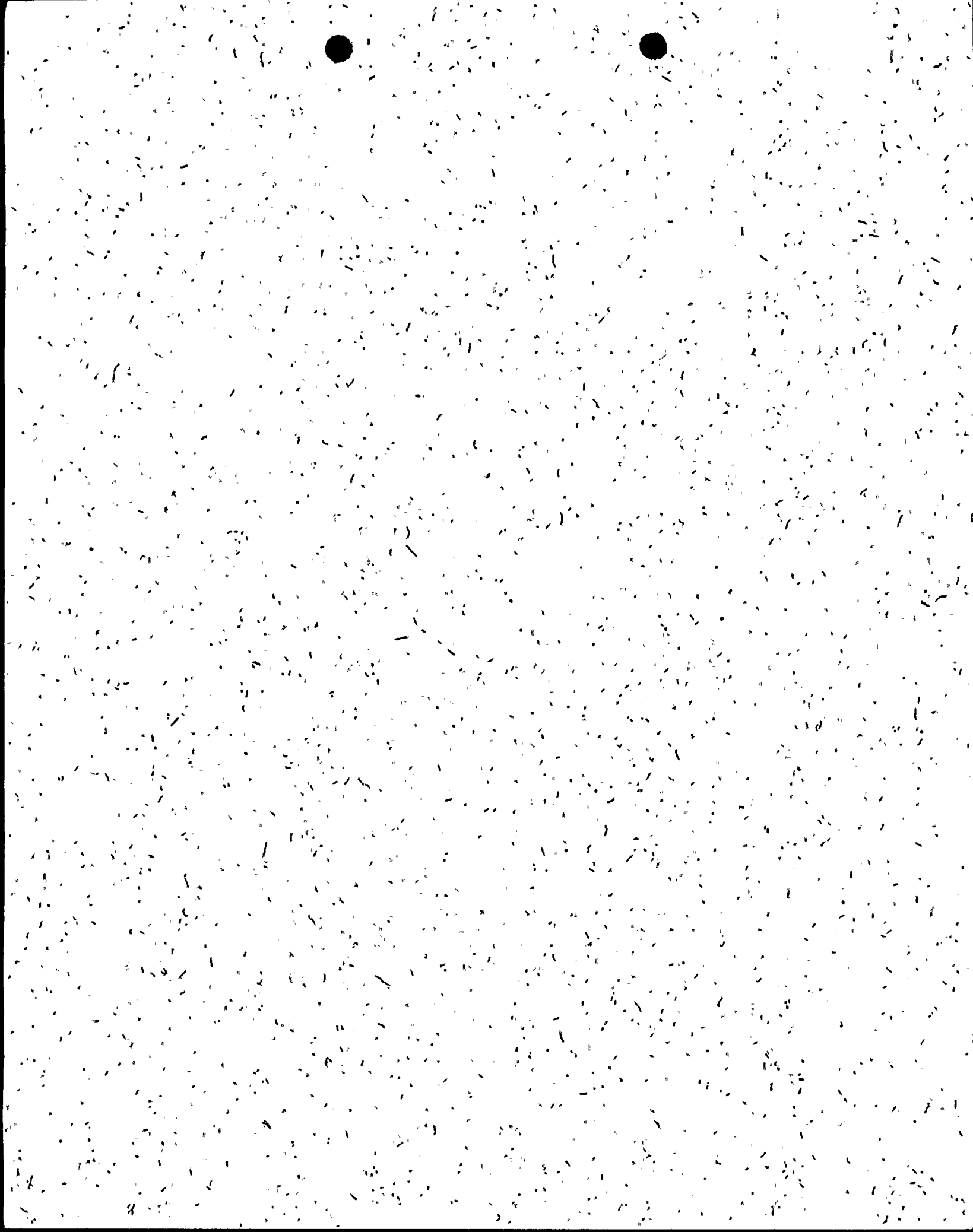
6. FP&L lists the critical structures for risk assessment (ref. 7 p 3) as the containment buildings, turbine building, control building, auxiliary building spent fuel buildings, emergency diesel generator buildings, intake structure and the (twin 400') fossil unit chimneys (413' above mean sea level). We request that all fire fighting equipment, all fuel tanks (including the tanks associated with fossil units 1 & 2), and the switchyard be added to the list for risk assessment, even thought they may not be structures in the strictest sense.

7. In a study conducted by Brookhaven National Laboratory (ref. 8, p 4-2) the worst case scenario of an accident at a spent fuel pool of a typical decommissioned pressurized water reactor anticipates that prompt fatalities will be 95, latent fatalities will be 143,000 and condemned land will be 2,790 square miles. We realize that Turkey Point has not been decommissioned, but there are two reactors on site, not one. The Reactor Spent Fuel Storage report (ref. 9, p 3) states that as of 11/4/98 there are 1,578 spent fuel assemblies being stored on site. This potential catastrophic accident should receive a separate risk assessment analysis since the consequences are comparable to a core-melt atmospheric accident at one reactor (ref. 8, p 4-4).

8. Bird strike hazards are a documented problem at Homestead Air Reserve Base (ref. 10). Bird strikes have the potential for causing additional aircraft crashes in the Turkey Point area. Efforts to mitigate this situation are not likely to occur, due to the close proximity of Biscayne National Park and Everglades National Park. Bird populations are protected and the killing of birds, the destruction of their habitat or attempts to traumatize bird life by noise or chemical means would be politically and legally impossible. Recently Miami-Dade government stated a willingness to maintain a buffer of undeveloped land around the former HAFB. This would likely increase bird habitat and exacerbate the problem. A site-specific quantitative multiplier based upon the bird strike hazards needs to be incorporated into the probability calculations of the air crashes in the SER.

<u>Conclusions:</u>

Without guessing the outcome of the SER, Sierra Club, Miami Group believes that developing a commercial airport next to two nuclear reactors at Turkey Point creates an intolerable radiological danger for south Florida far exceeding the 10 CFR 100 guidelines. We agree with FP&L that adjacent structures and canals may mitigate some aspects of an air crash and we agree that the containment buildings probably would not experience perforation. However, as discussed supra, the existence of the following unquantified problems may increase the risk of air crashes.



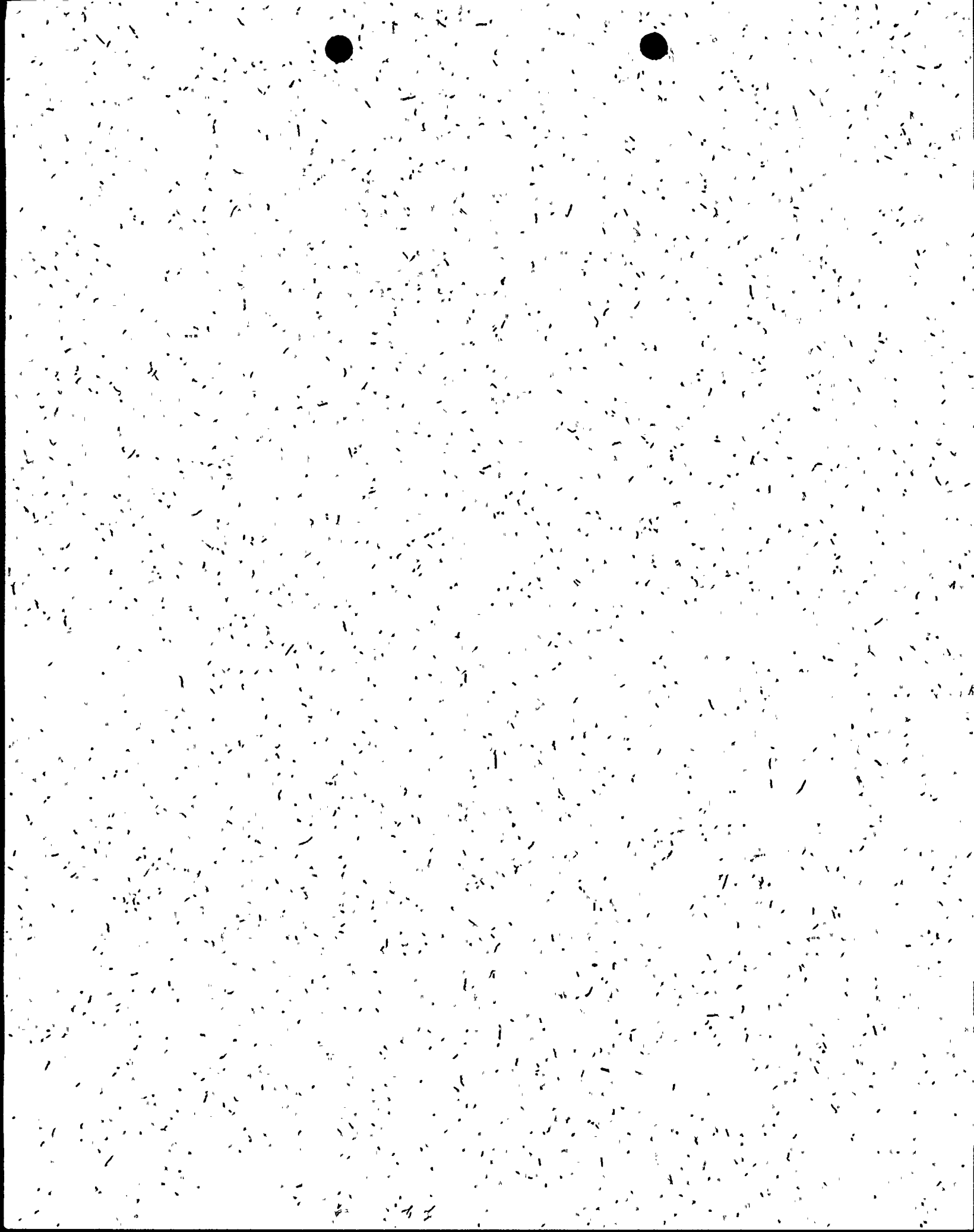
Foreign aircraft may not be up to the standards to which we are accustomed, e.g. old aircraft, reduced maintenance, marginally trained pilots and overloaded planes. Language difficulties may also occur between air traffic controllers and foreign air pilots. Moreover, the arrival and departure flight patterns appear to be complex and convoluted (ref.11, p 1&2) with aircraft crossing over and under various federal airways to reach or leave the airport. Finally there is a significantly higher risk of bird strikes at Homestead than is the norm nationally.

Sincerely,

Alan Farago
Conservation Chair

Mark Oncavage
Energy Chair

Barbara Lange
Everglades Chair



References

1. Draft Supplemental Environmental Impact Statement, Disposal of Portions of the Former Homestead Air Force Base, Florida , U.S.Air Force and Federal Aviation Administration, December, 1999.

2. Letter to Thomas F. Plunkett, Florida Power and Light from Kahtan N. Jabbour, Senior Project Manager, Office of Nuclear Reactor Regulation, May 4, 1998.

3. NUREG-0800, Standard Review Plan 10 CFR Part 100, 3.5.1.6 Aircraft Hazards, rev. 2 - July 1981

4. Letter to U.S. Nuclear Regulatory Commission from R.J. Hovey, Vice President, Turkey Point Plant, June 15, 998.

5. Memorandum and Order in the matter of Consumers Power Company (Big Rock Nuclear Power Plant) Atomic Safety and Licensing Board, U.S. Nuclear Regulatory Commission, March 6, 1984 (Docket No. 50-155-OLA).

6. Final Safety Analysis Report , Turkey Point Plant, Units 3 & 4, Florida Power and Light Company, volume 1, rev. 5, July 1987.

7. Letter to U.S. Nuclear Regulatory Commission from R.J. Hovey, Vice President, Turkey Point Plant, November 17, 1999.

8. NUREG/CR-6451, A Safety and Regulatory Assessment of Generic BWR and PWR Permanently Shutdown Nuclear Power Plants , Brookhaven National Laboratory, August 1997.

9. Reactor Spent Fuel Storage, http://www.nrc.gov/OPA/drycask/sfdata.htm, November 4, 1998.

10. Memorandum for Distribution from Steven R. Fulghum, Col., USAFR, 482d Fighter Wing Bird Hazard Working Group, March 25, 1996.

11. Letter to U.S. Nuclear Regulatory Commission from Douglas J. Heady, SAF/GCN U.S. Air Force, August 23, 1999 enclosure HST Departure and Arrival Altitude Restrictions .

1993

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 DHRS

Prepared by: Peter G Bagley 11 APR 94

Reviewed by: J L Wanek 4/12/94

1993
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT - UNITS 3 & 4

TABLE OF CONTENTS

1993
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT - UNITS 3 & 4

EXECUTIVE SUMMARY

The data obtained through the Turkey Point Radiological Environmental Monitoring Program verifies the levels of radiation and concentrations of radioactive materials in environmental samples is 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.

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

1993
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
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 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 Technical Specifications 3/4.12 of Turkey Point Unit 3 & 4 Technical Specifications.

1. **Sample Locations, Types and Frequencies:**

   a. Direct radiation gamma exposure rate is monitored continuously at 21 locations by thermoluminescent dosimeters (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.

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

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

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

2. **Analytical Responsibility:**

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

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

C. Analytical Results

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

D. Land Use Census

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

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

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

E. Interlaboratory Comparison Program

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

III. DISCUSSION AND INTERPRETATION OF RESULTS

A. Reporting of Results

The Annual Radiological Environmental Operating Report contains the summaries, interpretations and information required by the Turkey Point Units 3 & 4 Technical Specifications. Table 1 provides a summary of the measurements made for the nuclides required by Technical Specifications, Table 3.12-2, 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:**

All the results for the first quarter are unavailable due to exposure during transit. The results for direct radiation monitoring and for the remainder of the year are consistent with past measurements for the specified locations. The exposure rate data shows no indication of any trends attributed to effluents from the plant. The measured exposure rates are consistent with exposure rates that were observed during the preoperational surveillance program. Direct radiation monitoring results are summarized in Table 1.

2. **Air Particulates/Radioiodine:**

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 occuring K-40 at levels consistent with past measurements.

3. **Waterborne; Surface Water:**

The results for radioactivity measurements in surface water samples are consistent with past measurements. Tritium was reported as present in the surface water samples collected from sites T-81 and T-42. 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 4% of the reporting value specified by Technical Specifications, Table 3.12-2.

4. **Waterborne; Sediment:**

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

5. **Food Products:**

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

6. Broad Leaf Vegetation:

The results for radioactivity measurements are consistent with past measurements. Cs-137 was detected, as in the past, in samples collected from all locations. The maximum value is about 22% of the Table 3.12-2 reporting level. No other fission products were detected.

C. Conclusions

The data obtained through the Turkey Point Plant Radiological Environmental Monitoring Program verifies that the levels of radiation and concentrations of radioactive materials in environmental samples, representing the highest potential exposure pathways to members of the public, are not being increased.

Additionally, supplemental to the Technical Specifications, sampling of the direct exposure, inhalation, and ingestion pathways, performed by HRS, 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, 1993
(County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Exposure Rate, 64[d]	---	5.6 (61/61) 4.4 - 7.8	NW-10 10 mi., NW	7.7 (3/3) 7.6 - 7.8	6.2 (3/3) 5.8 - 6.4

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, 1993
(County, State)

PATHWAY: AIRBORNE
SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES
UNITS: PICO - Ci/M^3

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
^{131}I, 259	0.024	<MDA	---	---	<MDA
Gross Beta, 258	0.0025	0.013 (202/206) 0.002 - 0.027	T-71 0.5 mi., NNE	0.013 (51/52) 0.004 - 0.027	0.013 (52/52) 0.004 - 0.026
Composite Gamma Isotopic, 20					
^{7}Be	0.0052	0.1282 (16/16) 0.1052 - 0.1596	T-71 0.5 mi., NNE	0.1347 (4/4) 0.1180 - 0.1485	0.1358 (4/4) 0.1165 - 0.1597
^{40}K	0.012	0.0178 (1/16)	T-72 <1 mile, WSW	0.0178 (1/4)	<MDA
^{134}Cs	0.00069	<MDA	---	---	<MDA
^{137}Cs	0.00066	<MDA	---	---	<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, 1993
(County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Tritium, 36	230	295 (8/24) 87 - 937	T-81 6 mi., S	324 (7/12) 9 - 937	<MDA
Gamma Isotopic, 36					
^{40}K	60	292 (24/24) 184 - 400	T-81 6 mi., S	296 (12/12) 184 - 375	217 (11/12) 94 - 358
^{54}Mn	4	<MDA	---	---	<MDA
^{59}Fe	8	<MDA	---	---	<MDA
^{58}Co	4	<MDA	---	---	<MDA
^{60}Co	4	<MDA	---	---	<MDA
^{65}Zn	8	<MDA	---	---	<MDA
^{95}Zr-Nb	7	<MDA	---	---	<MDA
^{131}I	5	<MDA	---	---	<MDA
^{134}Cs	5	<MDA	---	---	<MDA
^{137}Cs	5	<MDA	---	---	<MDA
^{140}Ba-La	11	<MDA	---	---	<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, 1993
(County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 6					
^{7}Be	100	158 (4/4) 118 - 184	T-42 <1 mi., ENE	180 (1/2) 176 - 184	94 (1/2)
^{40}K	140	312 (4/4) 233 - 375	T-42 <1 mi., ENE	348 (2/2) 321 - 375	151 (2/2) 117 - 185
^{232}Th	52	54 (2/4) 50 - 57	T-42 <1 mi., ENE	57 (1/2)	50 (1/2)
^{226}Ra	49	516 (4/4) 297 - 669	T-42 <1 mi., ENE	648 (2/2) 627-669	107 (2/2) 62-152
^{235}U	---	83 (1/4)	T-81 6 mi., S	83 (1/2)	<MDA
^{58}Co	9	<MDA	---	---	<MDA
^{60}Co	12	<MDA	---	---	<MDA
^{134}Cs	14	<MDA	---	---	<MDA
^{137}Cs	12	<MDA	---	---	<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, 1993
(County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 4					
^{40}K	130	2167 (2/2) 1447 - 2887	T-81 6 mi., S	2167 (2/2) 1447 - 2887	1276 (2/2) 1198 - 1353
^{226}Ra	20	584 (2/2) 256 - 911	T-81 6 mi., S	584 (2/2) 256 - 911	<MDA
^{54}Mn	9	<MDA	---	---	<MDA
^{59}Fe	16	<MDA	---	---	<MDA
^{58}Co	9	<MDA	---	---	<MDA
^{60}Co	19	<MDA	---	---	<MDA
^{65}Zn	17	<MDA	---	---	<MDA
^{134}Cs	9	<MDA	---	---	<MDA
^{137}Cs	9	<MDA	---	---	<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, 1993
(County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 4					
^{40}K	130	2014 (2/2) 1701 - 2327	T-81 6 mi., S	2014 (2/2) 1701 - 2327	2679 (2/2) 1187 - 4171
^{54}Mn	9	<MDA	---	---	<MDA
^{59}Fe	16	<MDA	---	---	<MDA
^{58}Co	9	<MDA	---	---	<MDA
^{60}Co	10	<MDA	---	---	<MDA
^{65}Zn	17	<MDA	---	---	<MDA
^{134}Cs	9	<MDA	---	---	<MDA
^{137}Cs	9	<MDA	---	---	<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, 1993
(County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 36					
^{7}Be	71	1259 (24/24) 247 - 2262	T-41 2 mi., W/NW	1345 (12/12) 632 - 2071	1153 (12/12) 730 - 1662
^{40}K	100	3644 (24/24) 1952 - 5690	T-40 3 mi., W	3757 (12/12) 2434 - 5690	4140 (12/12) 3299 - 5349
^{137}Cs	8	89 (23/24) 13 - 426	T-41 2 mi., W/NW	137 (12/12) 23 - 426	14 (1/12)
^{226}Ra	20	38 (2/24) 27 - 48	T-40 3 mi., W	38 (2/12) 27 - 48	<MDA
^{131}I	9	<MDA	---	---	<MDA
^{134}Cs	8	<MDA	---	---	<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 and 50-251
Location of Facility Dade, Florida
(County, State)
Reporting Period January 1 - December 31, 1993

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

MDA refers to minimum detectable activity.

TABLE 1A
DEVIATIONS/MISSING DATA

A) **Pathway:** Direct Exposure

Location: All locations listed on Page 1 of Attachment A

Date: 12/16/92 to 03/24/93

Deviation: Failure to provide continuous monitoring.

Description of Problem: The TLDs, as a batch, were accidentally exposed to one or more sources of radiation during transit from field to Lab. Extensive analysis of data and shipping conditions failed to yield useable results.

Corrective Action: Counseled personnel in care required while handling these devices.

B) **Pathway:** Direct Exposure

Location: NW-5, 5 miles NW

Date: 06/17/93 to 09/22/93

Deviation: Failure to provide continuous monitoring.

Description of Problem: TLDs were missing when collection was attempted.

Corrective Action: Replaced TLDs.

C) **Pathway:** Airborne Particulates

Location: T-72, <1 mile WSW

Date: 07/07/93 to 07/13/93

Deviation: Failure to provide continuous air sampling.

Description of Problem: Upon collection attempt, particulate filter found damaged and separated from equipment.

Corrective Action: Replaced filter.

TABLE 1A
DEVIATIONS/MISSING DATA

D) Pathway: Airborne - Particulates and Iodines

Location: T-71, 0.5 mile NNE

Date: 08/24/93 to 09/03/93

Deviation: Failure to provide continuous air sampling.

Description of Problem: Suspected power outage caused an estimated sampling duration of 205 hours out of the 238 hour period.

Corrective Action: Verified equipment operability.

E) Pathway: Direct Exposure

Location: WNW-10, 10 miles WNW

Date: 09/22/93 to 12/14/93

Deviation: Failure to provide continuous monitoring.

Description of Problem: The TLDs were missing when collection was attempted.

Corrective Action: Replaced TLDs.

F) Pathway: Airborne - Particulates and Iodines

Location: T-71, 0.5 miles NNE

Date: 10/05/93 to 10/12/93

Deviation: Failure to provide continuous air sampling.

Description of Problem: Suspected power outage caused an estimated sampling duration of 140 hours out of the 168 hour period.

Corrective Action: Verified equipment operability.

TABLE 1A
DEVIATIONS/MISSING DATA

G) **Pathway:** Airborne - Particulates and Iodines

Location: T-72, <1 mile, WSW

Date: 10/12/93 to 10/20/93

Deviation: Failure to provide continuous air sampling.

Description of Problem: High winds disrupted sampling equipment. Estimated sample duration of 110 hours out of the 191 hour period.

Corrective Action: Reset sampling equipment and verified operability.

H) **Pathway:** Airborne - Particulates and Iodines

Location: T-52, 7 miles W

Date: 11/02/93 to 11/09/93

Deviation: Failure to provide continuous air sampling.

Description of Problem: Air sampling hose became disconnected from pump during the sampling period.

Corrective Action: Repaired sampling equipment and verified operability.

1993
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT, UNITS 3 & 4

TABLE 1B

ANALYSES WITH LLDs ABOVE TABLE 4.12-1 DETECTION CAPABILITIES
1/1/93 - 12/31/93

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

1993
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT, UNITS 3 & 4

TABLE 2

LAND USE CENSUS

Distance to Nearest (a, b)

Sector	6/93 Milk (c) Animal	6/93 Residence	6/93 Garden (d)
N	L (e)	2.1/350 (g)	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	O
SSW	L	L	L
SW	L	L	L
WSW	L	L	L
W	L	L	L
WNW	L	3.6/302 (h)	L
NW	L	L (g)	3.6/308
NNW	L	4.7/328	4.0/328

1993
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT, UNITS 3 & 4

TABLE 2

LAND USE CENSUS

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 2.1 miles bearing 350 degrees is recorded as 2.1/350.

c. Potential milk animal locations.

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

e. L denotes that the sector area is 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:

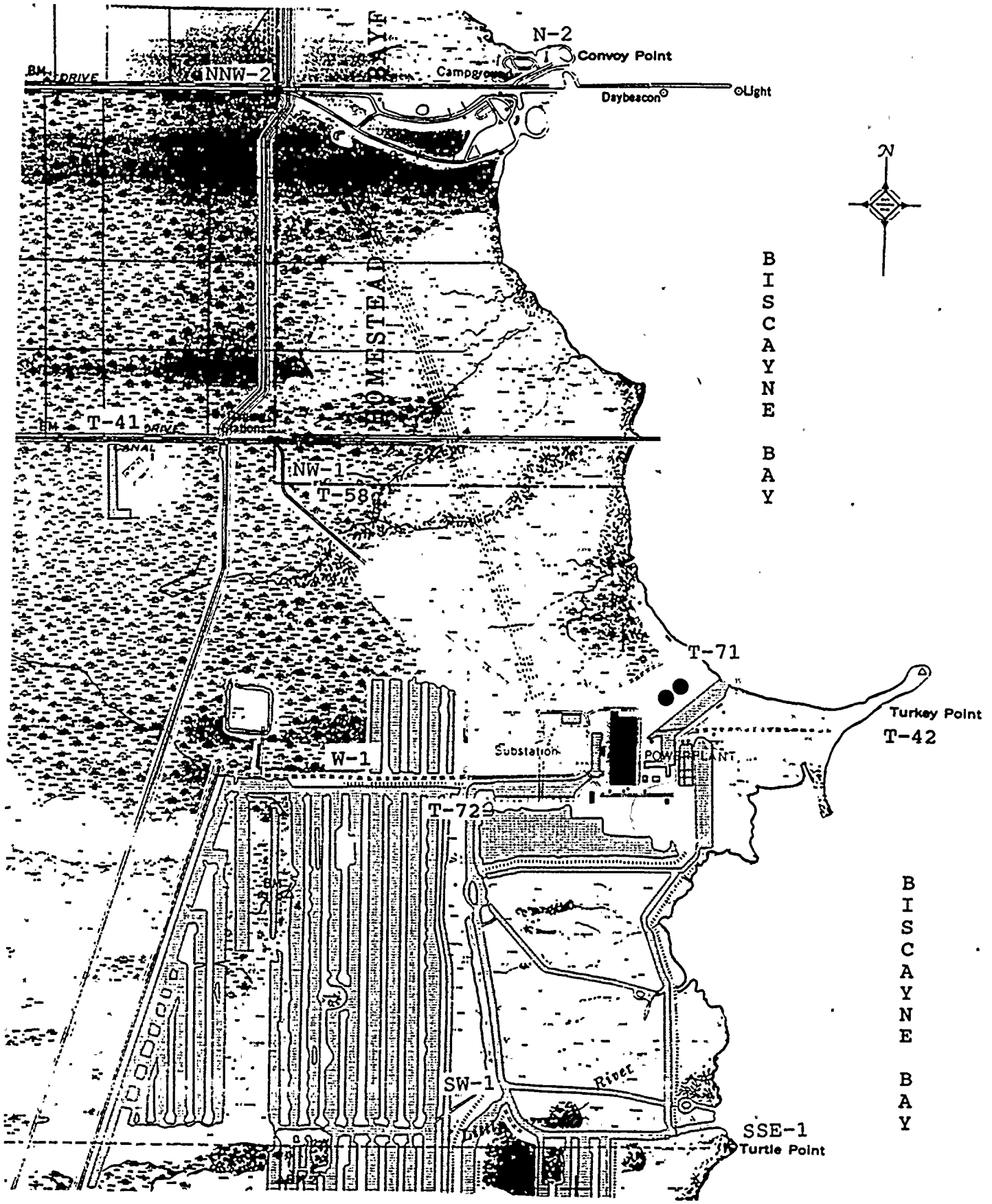
Sector	Distance	Description
N	1.8/349	24-hour Security Staffing Building
NW	3.5/304	24-hour Security Staffing
NNW	4.5/327	Mobile homes used for field offices
NNW	1.8/345	Security booth at park entrance

h. This house has been vacant since Hurricane Andrew.

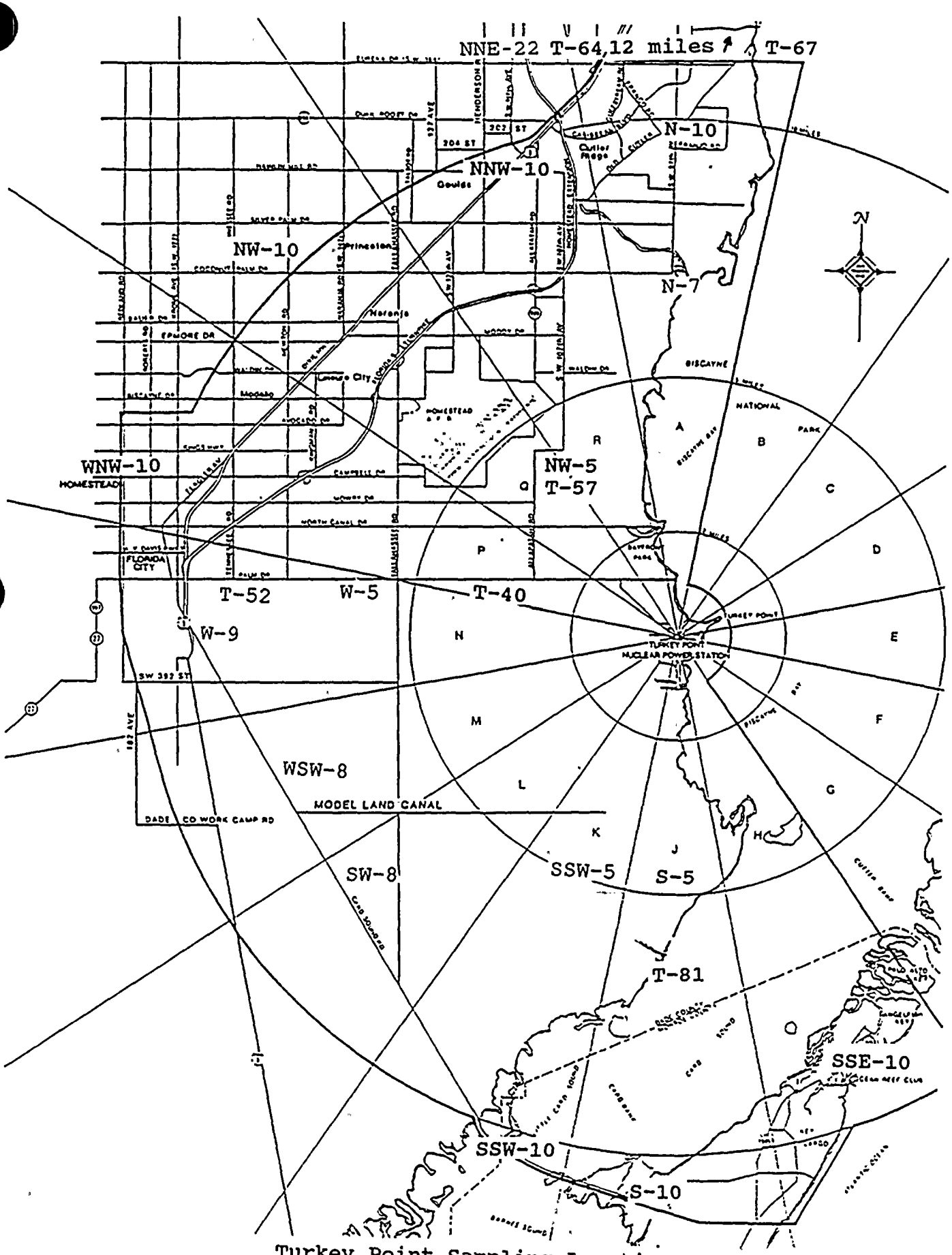
1993
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT, UNITS 3 & 4

ATTACHMENT A

KEY TO SAMPLE LOCATIONS



Turkey Point Sampling Locations
Plant Site Area



Turkey Point Sampling Locations

ATTACHMENT A

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

Location[a] Name	Description
N-2	Convoy 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 Cooling Canals
S-10	Card Sound Road at Steamboat Creek
SSE-1	Turtle Point
SSE-10	Ocean Reef
Control	
NNE-22	Natoma Substation

[a]The location name is the direction sector - approximate distance (miles)

ATTACHMENT A

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

Location Name	Direction Sector	Approximate Distance (miles)	Description
T-52	W	7	Florida City Substation Interim - Alternate to T-51
T-58	NW	1	Turkey Point Entrance Road
T-71	NNE	0.5	Florida City Sutstation Interim - Alternate to T-57
T-72	WSW	<1	Turkey Point Boy Scout Camp
Control:			
T-64	NNE	22	Natoma Substation

ATTACHMENT A

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

Location Name	Direction Sector	Approximate Distance (miles)	Description
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

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

Location Name	Direction Sector	Approximate Distance (miles)	Description
T-42	ENE	<1	Biscayne Bay at Turkey Point A1A
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

ATTACHMENT A

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

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

SAMPLES COLLECTED: BROAD LEAF VEGETATION
SAMPLE COLLECTION FREQUENCY: MONTHLY

Location Name	Direction Sector	Approximate Distance (miles)	Description
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
Control:			
T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Park, North to Matheson Hammock Park

1993
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT, UNITS 3 & 4

ATTACHMENT B

RADIOLOGICAL SURVEILLANCE OF

FLORIDA POWER AND LIGHT COMPANY'S

TURKEY POINT SITE

1993

First Quarter, 1993

Second Quarter, 1993

Third Quarter, 1993

Fourth Quarter, 1993

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

First Quarter, 1993

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

First Quarter, 1993

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	22	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
3. Waterborne			
3.a Surface Water	Monthly	3	9
3.b Shoreline Sediment	Semiannually	3	3
4. Ingestion			
4.a Fish and Invertebrates			
4.a.1 Crustacea	Semiannually	2	2
4.a.2 Fish	Semiannually	2	2
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	9
			Total: 201

* - Includes NRC split samples.

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

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

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

Each result is the average net response of two dosimeters.

Sample Site	Deployment Collection 12-16-92 03-24-93
N-2	(A)
N-7	(A)
N-10	(B)
NNW-2	(C)
NNW-10	(B) & (D)
NW-1	(A)
NW-5	(A)
NW-10	(A)
WNW-10	(A)
W-1	(A)
W-5	(A)
W-9	(A)
WSW-8	(A)
SW-1	(A)
SW-8	(A)
SSW-5	(A)
SSW-10	(B)
S-5	(A)
S-10	(A)
SSE-1	(A)
SSE-10	(A)
NNE-22	(A)

(A) - The dosimeters for the first quarter, 1993, were accidentally exposed to a container of radioactive sources while they were being transported from Miami to Orlando on March 25, 1993. Although two control dosimeters did accompany the field dosimeters on this trip, the two control dosimeters gave widely differing results for the exposures they measured -- 25.5 mR and 36.1 mR. (An exposure of approximately 1.0 mR would be normal for the six-day interval that the control dosimeters measured.) Many of the dosimeters from the respective field locations also showed wide differences between the different individual dosimeters for a given site. Due to the combined effects of the "poor geometry" of the radiation field, possible random shifting of the positions of the array of dosimeters and of the sources within their container during transportation, and effects of dosimeters near the sources apparently having shielded some of the low-energy radiation from reaching dosimeters farther away from the sources, it will not be possible to correct for this accidental exposure nor to recover any reasonable measurement data from the affected dosimeters.

(B) - These dosimeters were found lying on the ground near where they had been deployed.

(C) - These dosimeters were missing when collection was attempted.

(D) - The dosimeters for site NNW-10 were found lying in a tire rut, and they had been crushed.

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

Collection Date	Sample Site T52	T58	T64	T71	T72
01-07-93	<0.01	<0.01(A)	<0.01	<0.01	<0.01
01-12-93	<0.02	<0.02	<0.02	<0.02	<0.02
01-19-93	<0.01	<0.01	<0.01	<0.01	<0.01
01-26-93	<0.01	<0.01	<0.01	<0.01	<0.01
02-03-93	<0.02	<0.02	<0.02	<0.02	<0.02
02-08-93	<0.03	<0.03	<0.03	<0.03	<0.03
02-16-93	<0.02	<0.02(B)	<0.02	<0.02	<0.02
02-22-93	<0.03	<0.03	<0.03	<0.03	<0.03
03-02-93	<0.03	<0.03	<0.03	<0.03	<0.03
03-09-93	<0.01	<0.01	<0.01	<0.01	<0.01
03-16-93	<0.02	<0.02	<0.02	<0.02	<0.02
03-25-93	<0.02	<0.02	<0.02	<0.02	<0.02
03-31-93	<0.01	<0.01	<0.01	<0.01	<0.01

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

(B) - The sampling equipment was moved from the FP&L Wellness Center back to the Plant Entrance Road area at the beginning of this sample.

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew.

Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

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

Collection Date	Sample Site T52	T58	T64	T71	T72
01-07-93	0.009 ± 0.001	(A0.005 ± 0.002	0.009 ± 0.001	0.004 ± 0.001	0.005 ± 0.001
01-12-93	<0.006	0.007 ± 0.002	0.007 ± 0.002	0.004 ± 0.002	<0.007
01-19-93	0.010 ± 0.002	0.011 ± 0.002	0.015 ± 0.002	0.013 ± 0.002	0.010 ± 0.002
01-26-93	0.010 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.012 ± 0.002
02-03-93	0.018 ± 0.002	0.013 ± 0.002	0.018 ± 0.002	0.013 ± 0.002	0.016 ± 0.002
02-08-93	0.009 ± 0.002	0.007 ± 0.002	0.004 ± 0.002	0.009 ± 0.002	0.009 ± 0.002
02-16-93	0.013 ± 0.002	(B*0.013 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.012 ± 0.002
02-22-93	0.022 ± 0.003	*0.015 ± 0.002	0.014 ± 0.002	0.017 ± 0.002	0.023 ± 0.003
03-02-93	0.014 ± 0.002	*0.013 ± 0.002	0.014 ± 0.002	0.013 ± 0.002	0.014 ± 0.002
03-09-93	0.017 ± 0.002	*0.016 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.018 ± 0.002
03-16-93	0.018 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.013 ± 0.002
03-25-93	0.004 ± 0.001	0.002 ± 0.001	0.003 ± 0.001	0.004 ± 0.001	<0.003
03-31-93	0.009 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.009 ± 0.002	0.010 ± 0.002
Means:	0.012 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.011 ± 0.001

* - NRC split samples.

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

(B) - The sampling equipment was moved from the FP&L Wellness Center back to the Plant Entrance Road area at the beginning of this sample.

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew.

Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

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

First Quarter, 1993

Sample Site	Be-7	K-40	Cs-134	Cs-137
T52	0.1052 ± 0.0108	<0.0211	<0.0008	<0.0011
T58	0.1218 ± 0.0118	<0.0227	<0.0009	<0.0007
T64	0.1319 ± 0.0112	<0.0215	<0.0011	<0.0013
T71	0.1304 ± 0.0108	<0.0201	<0.0012	<0.0008
T72	0.1145 ± 0.0107	<0.0188	<0.0011	<0.0011

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew.

Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	01-13-93	<138	214 ± 31	<3	<8	<4	<4	<9	<8	<8	<5	<4	<6
	02-15-93	<134	239 ± 34	<3	<8	<3	<4	<8	<8	<6	<4	<4	<4
	03-15-93	<138	303 ± 36	<4	<7	<5	<5	<10	<6	<5	<5	<4	<5
T67	01-13-93	<138	147 ± 27	<4	<8	<4	<4	<9	<7	<8	<4	<4	<7
	02-15-93	<134	282 ± 35	<3	<10	<5	<4	<9	<8	<6	<4	<4	<6
	03-15-93	<138	<80	<3	<9	<4	<3	<7	<7	<5	<4	<4	<5
T81	01-13-93	559 ± 52	227 ± 34	<4	<8	<4	<4	<11	<8	<7	<5	<4	<6
	02-11-93	186 ± 44	258 ± 38	<4	<8	<4	<4	<8	<4	<6	<4	<4	<8
	03-12-93	<138	278 ± 38	<4	<9	<4	<5	<7	<6	<7	<4	<4	<4

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

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

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

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Others
T42	01-14-93	176 ± 69	375 ± 71	<13	<12	<12	<11	Ra-226: 669 ± 23 Th-232: 57 ± 26
T67	01-13-93	94 ± 31	117 ± 42	<6	<7	<8	<9	Ra-226: 152 ± 10
T81	01-13-93	153 ± 49	319 ± 65	<8	<10	<10	<11	Ra-226: 469 ± 20 U-235: 83 ± 33

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
T67	03-09-93	1198 ± 170	<19	<19	<10	<13	<43	<18	<20	ND	ND
T81	03-04-93	1447 ± 177	<17	<44	<17	<21	<44	<15	<19	256 ± 26	ND

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
T67	03-08-93	1187 ± 162	<17	<38	<14	<15	<31	<19	<19	ND	ND
T81	03-04-93	1701 ± 191	<13	<39	<17	<24	<32	<19	<23	ND	ND

ND - Non-detectable.

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

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
T40	01-15-93(A)	247 ± 36	1952 ± 102	<12	<8	<8
	02-15-93	1117 ± 72	4217 ± 168	<10	<12	54 ± 7
	03-15-93	1017 ± 58	3562 ± 146	<11	<11	13 ± 5
T41	01-15-93(A)	1728 ± 94	3915 ± 182	<19	<14	28 ± 6
	02-15-93	1199 ± 65	4973 ± 166	<10	<11	55 ± 7
	03-15-93	1002 ± 65	3009 ± 140	<10	<11	52 ± 7
T67	01-14-93	1645 ± 83	3720 ± 155	<17	<10	14 ± 5
	02-15-93	1419 ± 69	4962 ± 168	<10	<11	<11
	03-15-93	871 ± 71	3636 ± 164	<11	<11	<11

(A) - Other species of green leafy vegetation were added to the Brazilian pepper for these samples because sufficient quantities of only Brazilian pepper were not available due to damage to the pepper trees caused by Hurricane Andrew.

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

Second Quarter, 1993

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

Second Quarter, 1993

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	22	44
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
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 Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	10*
			Total: 197

* - Includes NRC split samples.

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

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

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

Each result is the average net response of two dosimeters.

Sample Site		Deployment Collection 03-24-93 06-17-93
N-2	(A)	6.9 ± 0.4
N-7		5.7 ± 0.3
N-10		5.7 ± 0.3
NNW-2	(B)	5.1 ± 0.3
NNW-10		6.0 ± 0.3
NW-1		5.5 ± 0.3
NW-5		5.3 ± 0.3
NW-10		7.8 ± 0.4
WNW-10		6.6 ± 0.3
W-1		7.2 ± 0.4
W-5		5.0 ± 0.3
W-9		5.0 ± 0.3
WSW-8		5.2 ± 0.3
SW-1		5.4 ± 0.3
SW-8		5.2 ± 0.3
SSW-5		5.3 ± 0.3
SSW-10	(C)	5.4 ± 0.3
S-5		5.4 ± 0.3
S-10		6.2 ± 0.3
SSE-1		5.3 ± 0.3
SSE-10		6.3 ± 0.3
NNE-22		6.4 ± 0.3

(A) - The utility pole upon which the dosimeters for site N-2 were mounted had been removed during this sampling interval due to construction operations. The dosimeters were recovered still attached to the pole which was lying in a storage area at the site.

(B) - The PVC container in which the dosimeters at site NNW-2 were deployed had been stolen. The dosimeters themselves were found hanging at the proper location in a plastic bag.

(C) - The result for site SSW-10 is based on a single dosimeter due to failure of the other dosimeter.

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

Collection Date	Sample Site T52	T58	T64	T71	T72
04-06-93	<0.01	<0.01	<0.01	<0.01	<0.01
04-13-93	<0.01	<0.01	<0.01	<0.01	<0.01
04-20-93	<0.03	<0.03	<0.03	<0.03	<0.03
04-27-93	<0.01	<0.01	<0.01	<0.01	<0.01
05-03-93	<0.02	<0.02	<0.02	<0.02	<0.02
05-10-93	<0.01	<0.01	<0.01	<0.01	<0.01
05-18-93	<0.01	<0.01	<0.01	<0.01	<0.01
05-25-93	<0.01	<0.01	<0.01	<0.01	<0.01
06-01-93	<0.01	<0.01	<0.01	<0.01	<0.01
06-08-93	<0.03	<0.03	<0.03	<0.03	<0.03
06-14-93	<0.02	<0.02	<0.02	<0.02	<0.02
06-23-93	<0.02	<0.01	<0.02	<0.01	<0.01
06-29-93	<0.03	<0.03	<0.03	<0.03	<0.04

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew.

Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

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

Collection Date	Sample Site T52	T58	T64	T71	T72
04-06-93	0.014 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.011 ± 0.002
04-13-93	0.018 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.011 ± 0.002	0.014 ± 0.002
04-20-93	0.018 ± 0.002	0.019 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.019 ± 0.002
04-27-93	0.015 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.019 ± 0.002	0.020 ± 0.003
05-03-93	0.017 ± 0.003	0.015 ± 0.003	0.013 ± 0.002	0.013 ± 0.002	0.014 ± 0.003
05-10-93	0.016 ± 0.002	*0.007 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.013 ± 0.002
05-18-93	0.013 ± 0.002	*0.015 ± 0.002	0.017 ± 0.002	0.012 ± 0.002	0.016 ± 0.002
05-25-93	0.017 ± 0.002	*0.012 ± 0.002	0.015 ± 0.002	0.019 ± 0.002	0.014 ± 0.002
06-01-93	0.006 ± 0.002	*0.006 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.007 ± 0.002
06-08-93	0.006 ± 0.002	0.006 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.008 ± 0.002
06-14-93	0.006 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.015 ± 0.002
06-23-93	0.009 ± 0.002	0.008 ± 0.001	0.007 ± 0.002	0.008 ± 0.001	0.009 ± 0.001
06-29-93	0.017 ± 0.002	0.022 ± 0.003	0.024 ± 0.003	0.027 ± 0.003	0.025 ± 0.003
Means:	0.013 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.014 ± 0.001

* - NRC split samples.

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew.

Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

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

Second Quarter, 1993

Sample Site	Be-7	K-40	Cs-134	Cs-137
T52	0.1246 ± 0.0118	<0.0199	<0.0009	<0.0008
T58	0.1596 ± 0.0132	<0.0195	<0.0012	<0.0011
T64	0.1597 ± 0.0145	<0.0149	<0.0016	<0.0006
T71	0.1485 ± 0.0138	<0.0155	<0.0012	<0.0008
T72	0.1431 ± 0.0126	0.0178 ± 0.0067	<0.0006	<0.0011

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	04-19-93	<136	348 ± 37	<4	<8	<4	<4	<8	<6	<6	<5	<4	<5
	05-17-93	<136	327 ± 40	<4	<10	<4	<5	<9	<7	<7	<3	<5	<7
	06-09-93	<143	297 ± 39	<4	<9	<4	<6	<10	<6	<8	<3	<4	<4
T67	04-19-93	<136	185 ± 32	<4	<9	<4	<5	<8	<9	<8	<4	<4	<6
	05-17-93	<136	358 ± 38	<4	<8	<4	<5	<8	<6	<7	<4	<5	<6
	06-11-93	<143	173 ± 31	<5	<9	<4	<4	<9	<8	<7	<4	<3	<4
T81	04-19-93	<136	332 ± 37	<4	<11	<4	<4	<10	<7	<7	<4	<4	<7
	05-17-93	<136	375 ± 37	<4	<7	<4	<5	<11	<6	<7	<4	<4	<8
	06-09-93	937 ± 59	308 ± 39	<4	<9	<4	<4	<8	<7	<9	<5	<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.

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

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226
T40	04-19-93	1020 ± 69	2709 ± 135	<15	<10	21 ± 5	ND
	*05-18-93	546 ± 55	3972 ± 156	<13	<12	31 ± 7	ND
	06-11-93	791 ± 63	4478 ± 165	<21	<9	30 ± 6	27 ± 9
T41	04-19-93	632 ± 52	3307 ± 125	<11	<10	23 ± 5	ND
	05-17-93	792 ± 74	4143 ± 170	<17	<12	65 ± 9	ND
	06-14-93	870 ± 63	3724 ± 149	<19	<11	116 ± 8	ND
T67	04-19-93	1415 ± 74	3263 ± 151	<17	<9	<12	ND
	05-17-93	766 ± 60	4080 ± 167	<16	<13	<12	ND
	06-11-93	924 ± 73	4646 ± 181	<22	<10	<11	ND

* - NRC split sample.

ND - Non-detectable.

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

Third Quarter, 1993

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

Third Quarter, 1993

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	22	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	68*
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	1
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	9
			Total: 198

* - Includes NRC split samples.

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

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

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

Each result is the average net response of two dosimeters.

Sample Site		Deployment Collection 06-17-93 09-22-93
N-2	(A)	6.3 ± 0.3
N-7		5.6 ± 0.3
N-10		5.4 ± 0.3
NNW-2	(B)	5.1 ± 0.3
NNW-10		6.2 ± 0.3
NW-1		5.4 ± 0.3
NW-5		(C)
NW-10		7.7 ± 0.4
WNW-10		6.4 ± 0.3
W-1		6.8 ± 0.4
W-5		5.7 ± 0.3
W-9		5.4 ± 0.3
WSW-8		5.3 ± 0.3
SW-1		6.1 ± 0.3
SW-8		5.4 ± 0.3
SSW-5		5.9 ± 0.3
SSW-10	(D)	5.2 ± 0.3
S-5		5.7 ± 0.3
S-10		6.5 ± 0.3
SSE-1		5.6 ± 0.3
SSE-10	(D)	6.6 ± 0.4
NNE-22		6.3 ± 0.3

(A) - These dosimeters for site N-2 were deployed at a new location at this site due to construction operations at the previous location.

(B) - These dosimeters for site NNW-2 were moved much higher on their utility pole in an attempt to reduce the frequency of vandalism at this site.

(C) - The dosimeters for site NW-5 were missing when collection was attempted.

(D) - The results for sites SSW-10 and SSE-10 are each based on single dosimeters due to anomalous behavior of the other dosimeters.

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

Collection Date	Sample Site T52	T58	T64	T71	T72
07-07-93	<0.01	<0.01	<0.01	<0.01	<0.01(A)
07-13-93	<0.02	<0.02	<0.02	<0.02	<0.01(B)
07-19-93	<0.02	<0.02	<0.02	<0.02	<0.02
07-27-93	<0.01	<0.01	<0.01	<0.01	<0.01
08-02-93	<0.02	<0.02	<0.02	<0.02	<0.02
08-12-93	<0.02	<0.02	<0.02	<0.02	<0.02
08-18-93	<0.02	<0.02	<0.01	<0.02	<0.02
08-24-93	<0.02	<0.02	<0.02	<0.02	<0.02
09-03-93	<0.01	<0.01	<0.01	<0.01(C)	<0.01
09-08-93	<0.04	<0.04	<0.04	<0.04	<0.04
09-14-93	<0.01	<0.01	<0.01	<0.01	<0.01
09-21-93	<0.01	<0.01	<0.01	<0.01	<0.01
09-29-93	<0.01	<0.01	<0.01	<0.01	<0.01

(A) - The sampling equipment had been disturbed during this sampling interval. The gas meter was knocked over and did not measure the full volume for this sample. This result is based on an estimated volume. Also, a counting geometry with higher than normal sensitivity was used for this sample.

(B) - The sampling equipment had been disturbed during this sampling interval. The particulate filter was not in place during most of this sample interval. The iodine filter cartridge did not appear to have been disturbed.

(C) - A power outage is suspected to have occurred during this sample. The equipment is estimated to have run for 205 hours out of the 238 total hours for this sampling interval.

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew.

Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

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

Collection Date	Sample Site T52	T58	T64	T71	T72
07-07-93	0.023 ± 0.002	0.020 ± 0.002	0.026 ± 0.002	0.024 ± 0.002	(A0.021 ± 0.002
07-13-93	0.012 ± 0.002	0.016 ± 0.002	0.020 ± 0.003	0.016 ± 0.003	(B)
07-19-93	0.020 ± 0.003	0.021 ± 0.003	0.028 ± 0.003	0.021 ± 0.003	0.021 ± 0.003
07-27-93	0.013 ± 0.002	0.012 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.013 ± 0.002
08-02-93	0.011 ± 0.002	*0.012 ± 0.003	0.019 ± 0.003	0.014 ± 0.003	0.013 ± 0.003
08-12-93	0.020 ± 0.002	*0.018 ± 0.002	0.025 ± 0.002	0.020 ± 0.002	0.019 ± 0.002
08-18-93	0.017 ± 0.002	*0.016 ± 0.002	0.019 ± 0.002	0.011 ± 0.002	0.014 ± 0.002
08-24-93	0.015 ± 0.002	*0.019 ± 0.003	0.019 ± 0.003	0.020 ± 0.003	0.017 ± 0.002
09-03-93	0.010 ± 0.001	0.008 ± 0.001	0.008 ± 0.001	(C0.007 ± 0.001	0.008 ± 0.001
09-08-93	0.012 ± 0.002	0.012 ± 0.003	0.011 ± 0.002	0.007 ± 0.002	0.012 ± 0.002
09-14-93	0.011 ± 0.002	0.015 ± 0.002	0.010 ± 0.002	0.012 ± 0.002	0.012 ± 0.002
09-21-93	0.009 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.009 ± 0.002	0.008 ± 0.002
09-29-93	0.008 ± 0.002	0.011 ± 0.002	0.013 ± 0.002	0.009 ± 0.002	0.010 ± 0.002
Means:	0.014 ± 0.001	0.014 ± 0.001	0.017 ± 0.001	0.014 ± 0.001	0.014 ± 0.001

* - NRC split samples.

(A) - The sampling equipment had been disturbed during this sampling interval. The gas meter was knocked over and did not measure the full volume for this sample. This result is based on an estimated volume.

(B) - The sampling equipment had been disturbed during this sampling interval. The holder for the particulate filter was detached from the air hose soon after the beginning of this sample, and the filter itself was severely damaged. No meaningful analysis could be performed on this filter.

(C) - A power outage is suspected to have occurred during this sample. The equipment is estimated to have run for 205 hours out of the 238 total hours for this sampling interval.

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew.

Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

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

Third Quarter, 1993

Sample Site	Be-7	K-40	Cs-134	Cs-137
T52	0.1133 ± 0.0106	<0.0201	<0.0012	<0.0009
T58	0.1086 ± 0.0110	<0.0206	<0.0011	<0.0011
T64	0.1165 ± 0.0104	<0.0206	<0.0009	<0.0010
T71	0.1180 ± 0.0112	<0.0275	<0.0012	<0.0008
T72	0.1079 ± 0.0115	<0.0184	<0.0011	<0.0010

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew.

Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	07-13-93	<137	338 ± 38	<4	<10	<3	<4	<8	<7	<6	<5	<4	<7
	08-18-93	87 ± 41	400 ± 39	<3	<8	<4	<4	<8	<8	<5	<4	<5	<7
	09-16-93	<134	289 ± 33	<3	<8	<4	<4	<9	<7	<6	<4	<3	<5
T67	07-19-93	<137	252 ± 32	<3	<9	<3	<4	<9	<7	<5	<4	<4	<6
	08-19-93	<131	326 ± 37	<4	<8	<4	<5	<8	<8	<5	<3	<3	<5
	09-17-93	<134	249 ± 33	<3	<6	<4	<4	<9	<6	<6	<5	<3	<5
T81	07-14-93	210 ± 46	317 ± 38	<5	<9	<4	<5	<10	<8	<7	<6	<4	<7
	08-18-93	159 ± 43	305 ± 36	<4	<8	<4	<5	<8	<6	<6	<4	<4	<4
	09-16-93	<136	334 ± 38	<4	<9	<4	<6	<7	<7	<7	<5	<3	<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 SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Ra-226	Th-232
T42	07-14-93	184 ± 55	321 ± 72	<10	<11	<13	<11	627 ± 21	ND
T67	07-12-93	<66	185 ± 41	<6	<5	<7	<6	62 ± 24	50 ± 12
T81	07-14-93	118 ± 38	233 ± 58	<8	<8	<7	<7	297 ± 13	50 ± 16

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
T67	08-19-93	1353 ± 191	<16	<38	<19	<20	<44	<21	<18	ND	ND
T81	We were not able to schedule attempts to collect this sample. Efforts continue.										

4.a.2 FISH - (T67: Needlefish) - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
T67	09-13-93	4171 ± 299	<23	<48	<23	<26	<49	<25	<25	ND	ND
T81	We were not able to schedule attempts to collect this sample. Efforts continue.										

ND - Non-detectable.

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

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
T40	07-19-93	650 ± 54	3600 ± 148	<11	<8	36 ± 6
	08-20-93	1761 ± 79	3656 ± 149	<13	<10	23 ± 7
	09-17-93	2262 ± 89	3875 ± 159	<24	<11	88 ± 8
T41	07-19-93	1142 ± 67	4025 ± 161	<12	<10	98 ± 8
	08-20-93	1534 ± 82	2558 ± 124	<13	<9	426 ± 14
	09-17-93	2071 ± 96	3481 ± 150	<24	<10	192 ± 10
T67	07-19-93	730 ± 50	4500 ± 161	<10	<11	<10
	08-19-93	1047 ± 59	4973 ± 155	<11	<10	<11
	09-17-93	1024 ± 74	5349 ± 187	<23	<10	<12

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

Fourth Quarter, 1993

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

Fourth Quarter, 1993

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	22	21
2. Airborne			
2.a Air Iodines	Weekly	5	64
2.b Air Particulates	Weekly	5	68*
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	1	1
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	10*
			Total: 174

* - Includes NRC split samples.

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

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

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

Sample Site		Deployment Collection 09-22-93 12-14-93 (A)
N-2		5.54 ± 0.17
N-7		4.79 ± 0.15
N-10	(B)	4.94 ± 0.16
NNW-2		4.36 ± 0.14
NNW-10		5.68 ± 0.17
NW-1		4.65 ± 0.13
NW-5		4.74 ± 0.13
NW-10		7.55 ± 0.27
WNW-10	(C)	
W-1		6.38 ± 0.17
W-5		4.35 ± 0.14
W-9		4.60 ± 0.14
WSW-8		4.80 ± 0.16
SW-1		4.91 ± 0.14
SW-8		4.94 ± 0.15
SSW-5		4.89 ± 0.16
SSW-10	(B)	5.00 ± 0.15
S-5		4.43 ± 0.13
S-10		5.38 ± 0.19
SSE-1		4.59 ± 0.14
SSE-10		5.65 ± 0.16
NNE-22		5.84 ± 0.16

(A) - All of the above results were obtained using Panasonic UD-814 environmental dosimeters and a Panasonic UD-706A TLD reader. Previous results in recent years were obtained using Victoreen CaF_2:Mn TLD bulbs and a Harshaw 2000 TLD reader, which are now obsolete. All subsequent results will be obtained using the Panasonic equipment, until it needs to be replaced with newer equipment.

(B) - These dosimeters were found lying on the ground upon collection.

(C) - This dosimeter was missing when collection was attempted.

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

Collection Date	Sample Site T52	T58	T64	T71	T72
10-05-93	<0.02	<0.02	<0.02	<0.02	<0.02
10-12-93	<0.03	<0.03	<0.03	<0.03(A)	<0.03
10-20-93	<0.01	<0.01	<0.01	<0.01	<0.02(B)
10-25-93	<0.02	<0.02	<0.02	<0.02	<0.02
11-02-93	<0.01	<0.01	<0.01	<0.01	<0.01
11-09-93	(C)	<0.01	<0.01	<0.02	<0.01
11-16-93	<0.03	<0.02	<0.02	<0.02	<0.02
11-23-93	<0.02	<0.02	<0.02	<0.02	<0.02
11-30-93	<0.02	<0.02	<0.02	<0.02	<0.02
12-07-93	<0.01	<0.01	<0.01	<0.01	<0.01
12-16-93	<0.02	<0.01	<0.01	<0.01	<0.01
12-22-93	<0.02	<0.02	<0.02	<0.02	<0.02
12-29-93	<0.02	<0.02	<0.02	<0.02	<0.02

(A) - This sample had a low collected volume with a normal flow rate. We believe a power outage occurred. The equipment is estimated to have run for 140 hours out of the 168 total hours for this sampling interval.

(B) - Sampling was interrupted during the mid-part of this sample due to disruption of the sampling equipment by high winds. The equipment is estimated to have run for 110 hours out of the 191 total hours for this sampling interval. Also, the air hose may have been loose during the early part of this sample.

(C) - There was no sample because an air hose became disconnected near the beginning of this sampling interval.

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew.

Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

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

Collection Date	Sample Site T52	T58	T64	T71	T72
10-05-93	0.011 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.005 ± 0.002
10-12-93	0.008 ± 0.002	0.007 ± 0.002	0.006 ± 0.002	<0.007(A)	0.005 ± 0.002
10-20-93	0.009 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	(B0.006 ± 0.002
10-25-93	0.011 ± 0.003	0.006 ± 0.002	0.010 ± 0.002	0.007 ± 0.002	0.007 ± 0.002
11-02-93	0.010 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.011 ± 0.002
11-09-93	(C)	*0.013 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.017 ± 0.002
11-16-93	0.007 ± 0.002	*0.008 ± 0.002	0.007 ± 0.002	0.005 ± 0.002	0.008 ± 0.002
11-23-93	0.009 ± 0.002	*0.010 ± 0.002	0.014 ± 0.002	0.008 ± 0.002	0.008 ± 0.002
11-30-93	0.014 ± 0.002	*0.009 ± 0.002	0.010 ± 0.002	0.012 ± 0.002	0.010 ± 0.002
12-07-93	0.017 ± 0.002	0.016 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.017 ± 0.002
12-16-93	0.018 ± 0.002	0.017 ± 0.002	0.020 ± 0.002	0.018 ± 0.002	0.019 ± 0.002
12-22-93	0.012 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.009 ± 0.002	0.014 ± 0.002
12-29-93	0.016 ± 0.002	0.017 ± 0.002	0.012 ± 0.002	0.018 ± 0.002	0.012 ± 0.002
Means:	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.011 ± 0.001

* - NRC split samples.

(A) - This sample had a low collected volume with a normal flow rate. We believe that a power outage occurred. The equipment is estimated to have run for 140 hours out of the 168 total hours for this sampling interval.

(B) - Sampling was interrupted during the mid-part of this sample due to disruption of the sampling equipment by high winds. The equipment is estimated to have run for 110 hours out of the 191 total hours for this sampling interval. Also, the air hose may have been loose during the early part of this sample.

(C) - There was no sample because an air hose became disconnected near the beginning of this sampling interval.

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew. Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

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

Fourth Quarter, 1993

Sample Site	Be-7	K-40	Cs-134	Cs-137
T52	0.1491 ± 0.0152	<0.0127	<0.0011	<0.0008
T58	0.1462 ± 0.0121	<0.0159	<0.0013	<0.0008
T64	0.1350 ± 0.0116	<0.0217	<0.0009	<0.0008
T71	0.1420 ± 0.0121	<0.0200	<0.0011	<0.0011
T72	0.1188 ± 0.0120	<0.0217	<0.0013	<0.0008

Supplementary air sample site T52 is now being temporarily used as a substitute for Technical Specifications site T57, which was destroyed by Hurricane Andrew. Supplementary air sample site T71 is now being temporarily used as a substitute for Technical Specifications site T51, which was destroyed by Hurricane Andrew.

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	10-14-93	<131	257 ± 34	<4	<10	<4	<5	<7	<5	<6	<4	<4	<6
	11-05-93	<140	201 ± 38	<4	<10	<4	<5	<7	<7	<9	<4	<4	<7
	12-10-93	<135	235 ± 36	<4	<7	<4	<5	<10	<8	<8	<4	<3	<5
T67	10-18-93	<131	196 ± 39	<4	<9	<4	<5	<8	<8	<7	<4	<4	<6
	11-08-93	<127	94 ± 32	<4	<6	<4	<4	<8	<5	<6	<5	<3	<6
	12-09-93	<135	130 ± 27	<3	<7	<3	<5	<9	<6	<8	<2	<3	<6
T81	10-14-93	129 ± 42	344 ± 39	<4	<8	<4	<4	<10	<8	<7	<4	<4	<5
	11-05-93	93 ± 40	184 ± 35	<4	<10	<5	<3	<9	<7	<9	<4	<4	<7
	12-09-93	<135	294 ± 33	<4	<9	<4	<4	<8	<6	<8	<4	<5	<9

(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.

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
T81	11-03-93	2887 ± 599	<68	<137	<66	<69	<149	<70	<68	911 ± 269	ND

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
T81	11-03-93	2327 ± 299	<26	<64	<26	<27	<65	<28	<41	ND	ND

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

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226
T40	10-19-93	1671 ± 71	3615 ± 146	<11	<9	16 ± 4	ND
	*11-09-93	1654 ± 75	2442 ± 118	<16	<8	45 ± 5	48 ± 10
	12-10-93	1240 ± 74	4282 ± 159	<16	<9	49 ± 7	ND
T41	10-19-93	1505 ± 79	2434 ± 118	<17	<10	405 ± 13	ND
	11-09-93	1915 ± 87	5690 ± 201	<19	<11	37 ± 8	ND
	12-10-93	1753 ± 74	3825 ± 158	<15	<11	148 ± 10	ND
T67	10-18-93	1662 ± 77	3299 ± 143	<16	<9	<18	ND
	11-08-93	1302 ± 71	3710 ± 149	<20	<12	<10	ND
	12-09-93	1053 ± 63	3537 ± 134	<14	<10	<10	ND

* - NRC split sample.

ND - Non-detectable.

1993
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT, UNITS 3 & 4

ATTACHMENT C

RESULTS FROM THE INTERLABORATORY COMPARISON PROGRAM 1993

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

January through June, 1993

Media	Nuclide	Collection Mon	Day	Yr	EPA Known	Units	Normal. Range	Mean of Analyses	N.D.K.	Action Level
WATER	Alpha	01	29	93	34	pCi/L	0.656	145.67	21.49	1
WATER	Beta	01	29	93	44	pCi/L	0.236	45.67	0.58	
WATER	Co-60	06	11	93	15	pCi/L	0.000	14.00	-0.35	
WATER	Zn-65	06	11	93	103	pCi/L	0.118	106.67	0.64	
WATER	Ru-106	06	11	93	119	pCi/L	0.049	103.33	-2.26	
WATER	Ba-133	06	11	93	99	pCi/L	0.059	95.33	-0.64	
WATER	Cs-134	06	11	93	5	pCi/L	0.000	5.00	0.00	
WATER	Cs-137	06	11	93	5	pCi/L	0.118	4.67	-0.12	
WATER	H-3	06	04	93	9844	pCi/L	0.072	9756.67	-0.15	
WATER	I-131	02	05	93	100	pCi/L	0.177	98.67	-0.23	
WATER	Sr-89	01	15	93	15	pCi/L	0.236	12.00	-1.04	
WATER	Sr-90	01	15	93	10	pCi/L	0.118	7.67	-0.81	

NOTES:

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

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

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

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

ACTION LEVEL:

(1) Cause: The cause of the result exceeding the action level is not known. It should be noted, however, that two-thirds of the participating laboratories in this cross-check exceeded the control limit.
Corrective Action: None at this time.

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

July through December, 1993

Media	Nuclide	Collection Mon	Day	Yr	EPA Known	Units	Normal. Range	Mean of Analyses	N.D.K.	Action Level
FILTER	Alpha	08	27	93	19	pCi/F	0.000	21.00	0.69	
FILTER	Beta	08	27	93	47	pCi/F	0.000	50.00	1.04	
FILTER	Cs-137	08	27	93	9	pCi/F	0.000	10.00	0.35	
FILTER	Sr-90	08	27	93	19	pCi/F	0.354	13.67	-1.85	
MILK	I-131	09	24	93	120	pCi/L	0.148	117.00	-0.43	
MILK	Cs-137	09	24	93	49	pCi/L	0.236	49.67	0.23	
MILK	K	09	24	93	1679	mg/L	0.359	1591.33	-1.81	
MILK	Sr-89	09	24	93	30	pCi/L	0.354	16.67	-4.62	1
MILK	Sr-90	09	24	93	25	pCi/L	0.118	15.33	-3.35	2
WATER	Alpha	07	23	93	15	pCi/L	0.000	15.00	0.00	
WATER	Alpha	10	29	93	20	pCi/L	0.000	22.00	0.69	
WATER	Beta	07	23	93	43	pCi/L	0.341	47.00	1.00	
WATER	Beta	10	29	93	15	pCi/L	0.236	21.00	2.08	
WATER	Co-60	11	12	93	30	pCi/L	0.118	29.33	-0.23	
WATER	Zn-65	11	12	93	150	pCi/L	0.158	156.67	0.77	
WATER	Ru-106	11	12	93	201	pCi/L	0.148	186.00	-1.30	
WATER	Ba-133	11	12	93	79	pCi/L	0.148	76.00	-0.65	
WATER	Cs-134	11	12	93	59	pCi/L	0.236	54.00	-1.73	
WATER	Cs-137	11	12	93	40	pCi/L	0.118	42.67	0.92	
WATER	H-3	11	05	93	7398	pCi/L	0.079	7452.33	0.13	
WATER	I-131	10	08	93	117	pCi/L	0.049	112.67	-0.63	
WATER	Sr-89	07	16	93	34	pCi/L	0.118	30.33	-1.27	
WATER	Sr-90	07	16	93	25	pCi/L	0.000	22.00	-1.04	

NOTES:

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

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

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

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

ACTION LEVEL:

(1) Cause: Erroneously over estimated chemical recovery of strontium carrier.
Corrective Action: Try to improve purity of isolated strontium carrier.

(2) Cause: Erroneously over estimated chemical recovery of strontium carrier.
Corrective Action: Try to improve purity of isolated strontium carrier.