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**MAY 12 2005**

L-2005-098  
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  
2004 Annual Radiological  
Environmental Operating Report

Enclosed is the 2004 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 Walter Parker at (305) 246-6632.

Sincerely,

Terry O. Jones  
Vice President  
Turkey Point Nuclear Plant

SM

Enclosure

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

JEAS

**2004**  
**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

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TURKEY POINT PLANT – UNITS 3 & 4

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**2004**  
**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 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, 2004 to December 31, 2004.

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 22 locations by thermoluminescent dosimeters (TLDs). TLDs are collected and analyzed quarterly.
- b. Airborne radiiodine 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.

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.

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E. Interlaboratory Comparison Program

The intercomparison program consists of participating in programs sponsored by the Department of Energy (DOE). The first round of samples was from Environmental Measurements Lab (EML) Quality Assessment Program (DOE-QAP). The second round of samples was from the DOE Mixed Analyte Performance Evaluation Program (MAPEP). DOE's EML was transferred to the Department of Homeland Security. A decision was made that continuing the QAP program would not be part of their new mission.

DOE's Office of Corporate Performance Assessment (EH-3) made a decision that the continuance of a similar program was in the best interests of the DOE and opened the program to non-DOE facilities. This other program provides similar testing (matrices, nuclides, and levels) as the former QAP and is referred to as the Mixed Analyte Performance Evaluation Program (MAPEP); however, MAPEP 12 did not include a vegetation matrix (MAPEP 13, for 2005, does). The State applied to participate and was accepted starting with MAPEP Session 12.

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.

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.

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 pre-operational surveillance program. Direct radiation monitoring results are summarized in Table 1.

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2. Air Particulates/Radioiodine:

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

3. Waterborne, Surface Water:

The results of radioactivity measurements in surface water samples are consistent with past measurements. Tritium was reported as present in 4 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 5% 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 10% of the reporting level specified by ODCM Table 5.1-2. No other fission products were detected.

7. Land Use Census

There were no changes to the land use relative to last year's report.

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

The State laboratory participated in QAP-60 and MAPEP 12.

In QAP-60, all results for those nuclides associated with nuclear power plant operation and using analytical methods used in the REMP are Acceptable.

In MAPEP 12, the results for Soil, Water, and Gross Beta on a filter matrix for those nuclides associated with nuclear power plant operation and using analytical methods used in the REMP are acceptable. The Air Sample had one warning for one nuclide, Cs-134; all others were acceptable. Although the result for Cs-134 is within the acceptance range, the warning was issued based on the bias.

The results are listed in Attachment C.

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 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 Miami-Dade, Florida, Reporting Period January 1 - December 31, 2004  
 (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>	Mean (f) <sup>b</sup>	
			Distance & Direction	Range	
Exposure Rate, 86 <sup>d</sup>	---	5.4 (82/82) 4.4 - 7.7	NW-10 10 mi., NW	7.5 (3/3) 7.3 - 7.7	6.2 (4/4) 5.9 - 6.4

Number of Non-routine Reported Measurements = 0

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 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251  
 Location of Facility Miami-Dade, Florida, Reporting Period January 1 - December 31, 2004  
 (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> Distance & Direction	Mean (f) <sup>b</sup> Range	
<sup>131</sup> I, 260	0.024	< MDA	---	---	< MDA
Gross Beta, 260	0.0025	0.015 (207/208) 0.004 - 0.031	T-72 < 1 mi., WSW	0.015 (52/52) 0.008 - 0.031	0.015 (52/52) 0.007 - 0.026
Composite Gamma Isotopic, 20					
<sup>7</sup> Be	0.0052	0.1551 (16/16) 0.1020 - 0.1997	T-72 < 1 mi., WSW	0.1645 (4/4) 0.1136 - 0.1908	0.1678 (4/4) 0.1317 - 0.1928
<sup>134</sup> Cs	0.00069	< MDA	---	---	< MDA
<sup>137</sup> Cs	0.00066	< MDA	---	---	< MDA
<sup>210</sup> Pb	---	0.0228 (6/16) 0.0183 - 0.0258	T-72 < 1 mi., WSW	0.0245 (4/4) 0.0227 - 0.0258	0.0269 (4/4) 0.0233 - 0.0304

Number of Non-routine Reported Measurements = 0

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 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251  
 Location of Facility Miami-Dade, Florida, Reporting Period January 1 - December 31, 2004  
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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	97 (4/24) 74 - 131	T-81 6 mi., S	97 (4/12) 74 - 131	<MDA
Gamma Isotopic, 36					
<sup>40</sup> K	60	318 (24/24) 192 - 448	T-81 6 mi., S	324 (12/12) 192 - 448	188 (12/12) 112 - 405
<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 Non-routine Reported Measurements = 0

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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	< MDA	---	---	< MDA
<sup>40</sup> K	140	268 (4/4) 136 - 369	T-81 6 mi., S	357 (2/2) 345 - 369	638 (2/2) 638 - 639
<sup>210</sup> Pb	---	< MDA	---	---	< MDA
<sup>226</sup> Ra	49	874 (4/4) 743 - 973	T-81 6 mi., S	948 (2/2) 922 - 973	1309 (2/2) 1292 - 1327
<sup>232</sup> Th	---	< MDA	---	---	50 (1/2)
<sup>238</sup> U	---	712 (2/4) 309 - 1114	T-81 6 mi., S	1114 (1/2)	1501 (2/2) 1169 - 1833
<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 Non-routine Reported Measurements = 0

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 Location of Facility Miami-Dade, Florida, Reporting Period January 1 - December 31, 2004  
 (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>	Mean (f) <sup>b</sup>	
			Distance & Direction	Range	
Gamma Isotopic, 4					
<sup>40</sup> K	130	1571 (2/2) 1541 - 1601	T-81 6 mi., S	1571 (2/2) 1541 - 1601	1070 (2/2) 930 - 1209
<sup>226</sup> Ra	20	562 (1/2)	T-81 6 mi., S	562 (1/2)	679 (1/2)
<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 Non-routine Reported Measurements = 0

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY  
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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	2500 (2/2) 2462 - 2539	T-81 6 mi., S	2500 (2/2) 2462 - 2539	2834 (2/2) 2554 - 3114
<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
<sup>226</sup> Ra	20	595 (2/2) 346 - 844	T-81 6 mi., S	595 (2/2) 346 - 844	<MDA

Number of Non-routine Reported Measurements = 0

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY  
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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	1261 (24/24) 468 - 2148	T-40 3 mi., W	1289 (12/12) 551 - 1829	1097 (12/12) 641 - 1842
<sup>40</sup> K	100	4445 (24/24) 2286 - 5927	T-41 2 mi., W/NW	5027 (12/12) 3760 - 5927	3224 (12/12) 2282 - 4726
<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	59 (21/24) 12 - 181	T-40 3 mi., W	76 (11/12) 38 - 181	90 (2/12) 37 - 142
<sup>210</sup> Pb	---	840 (2/24) 618 - 1062	T-40 3 mi., W	1062 (1/12)	< MDA
<sup>226</sup> Ra	---	344 (4/24) 233 - 554	T-41 2 mi., W/NW	554 (1/12)	594 (2/12) 541 - 646

Number of Non routine Reported Measurements = 0



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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  
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DEVIATIONS / MISSING DATA

- A) Pathway: Direct Exposure  
Location: S-10 , 8 miles South  
Dates: Second calendar quarter  
Deviation: Failure to provide continuous monitoring.  
Description of Problem: TLDs missing when collection was attempted.  
Corrective Action: Replaced missing TLD.
- B) Pathway: Direct Exposure  
Location: NW-10 , 10 miles Northwest  
Dates: Third calendar quarter  
Deviation: Failure to provide continuous monitoring.  
Description of Problem: TLDs missing when collection was attempted.  
Corrective Action: Replaced missing TLD.
- C) Pathway: Airborne, Radioiodines & Particulates  
Location: T-58, 1 mile, Northwest  
Dates: First three weekly samples for January  
Deviation: Failure to provide continuous monitoring.  
Run times : 179/189 hours, 139/145 hours, 144/212 hours  
(hours run/ hours in monitoring period)  
Description of Problem: Partial sample collected; sampling station had repetitive electrical system failure  
Corrective Action: Determined cause to be faulty building circuit breakers which were replaced.

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TABLE 1A  
(Page 2 of 3)

DEVIATIONS / MISSING DATA

D)	Pathway:	Airborne, Radioiodines & Particulates
	Location:	T-51, 1 mile, North-northwest
	Dates:	01/12/04 to 01/21/04
	Deviation:	Failure to provide continuous monitoring. Run time: 195 hours out of 212 hours monitoring period.
	Description of Problem:	Partial sample collected; sampling pump burned out during period.
	Corrective Action:	Replaced sampling pump; verified equipment operating correctly.
E)	Pathway:	Airborne, Radioiodines & Particulates
	Location:	T-72, less than 1 mile, West-Southwest
	Dates:	03/09/04 to 03/15/04
	Deviation:	Failure to provide continuous monitoring. Run times : 128 hours out of 145 hour monitoring period.
	Description of Problem:	Partial sample collected; sampling pump burned out during period.
	Corrective Action:	Replaced sampling pump; verified equipment operating correctly.
F)	Pathway:	Airborne, Radioiodines & Particulates
	Location:	T-51, 2 miles, North-northwest
	Dates:	03/23/04 to 03/29/04
	Deviation:	Failure to provide continuous monitoring. Run time: 53 hours out of 141 hours monitoring period.
	Description of Problem:	Sampling pump found running in reverse direction.
	Corrective Action:	Replaced sampling pump; verified equipment operating correctly.

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TABLE 1A  
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DEVIATIONS / MISSING DATA

- G) Pathway: Airborne, Radioiodines & Particulates  
Location: T-58, 1 mile, NorthWest  
Dates: 03/24/04 to 04/06/04  
Deviation: Failure to provide continuous monitoring.  
Run time: 51 hours out of 194 hour monitoring period  
Description of Problem: Electrical system failure; GFCI tripped three times during week.  
Corrective Action: Reset GFCI. Contacted LU, arrange for replacement of GFCI
- H) Pathway: Airborne, Radioiodines & Particulates  
Location: T-57, 4 miles, Northwest  
Dates: 06/22/04 to 06/29/04  
Deviation: Failure to provide continuous monitoring.  
Run time: 158 hours out of 168 hour monitoring period.  
Description of Problem: Loss of power to sampling site.  
Corrective Action: Utility contacted & power restored.
- I) Pathway: Airborne, Radioiodines & Particulates  
Location: T-58, 1 mile, Northwest  
Dates: 07/21/04 to 07/26/04  
Deviation: Failure to provide continuous monitoring of particulates.  
Description of Problem: Sampling hose became disconnected between particulate filter and iodine cartridge during monitoring period.  
Corrective Action: Reattached sampling hose; verified tight connection.

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**TABLE 1B**

**ANALYSIS WITH LLDs ABOVE ODCM TABLE 5.1-3 DETECTION CAPABILITIES**  
**1/1/2004 – 12/31/2004**

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

Distance to Nearest (a, b)

Sector	7/04 Milk (c) Animal	7/04 Residence (g)	7/04 Garden (d)
N	L (e)	2.0 / 354	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	3.7 / 302	4.5 / 303
NW	L	3.7 / 311	4.2 / 323
NNW	L	4.4 / 333	4.6 / 327

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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 2.0 miles bearing 354 degrees is recorded as 2.0 / 354.

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 / 349	24-hour Security Staff Building
NNW	1.9 / 349	Security booth at park entrance

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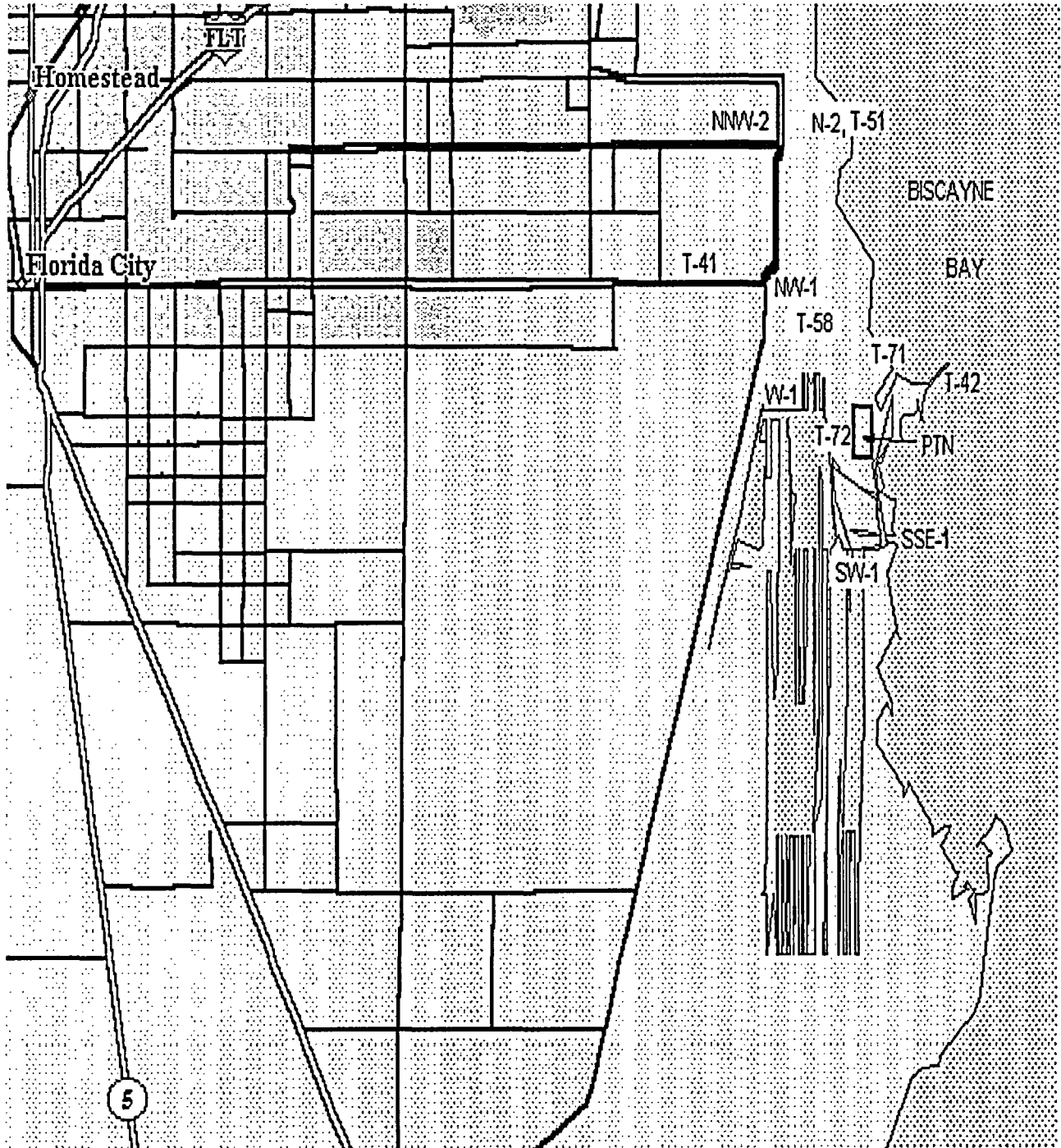
ATTACHMENT A

KEY TO SAMPLE LOCATIONS



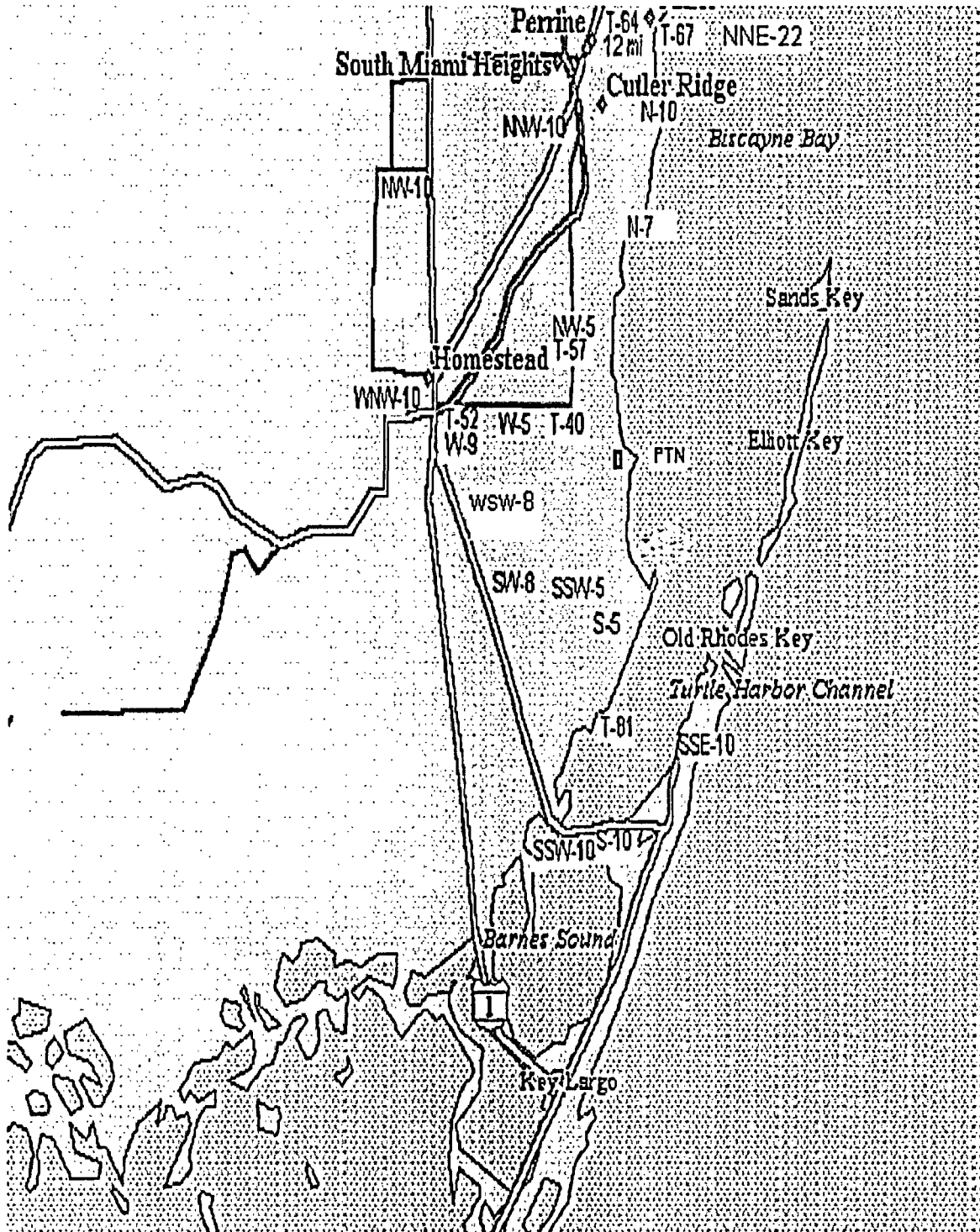
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NEAR SITE SAMPLING LOCATIONS



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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

Location <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 Cooling Canals
S-10	Card Sound Road at Steamboat Creek
SSE-1	Turtle Point
SSE-10	Ocean Reef
<u>Control</u>	
NNE-22	Natoma Substation , 2475 SW 16 Ct.

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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 , 2475 SW 16 Ct.
<u>Note</u>			
T-71	NNE	0.5	On site "Red Barn" picnic area. This sampling station may be used as an alternate to T-51.

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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
<u>Control:</u>			
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

<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
<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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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

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: 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

Control:

T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Plant, North to Matheson Hammock Park
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**2004  
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**

**2004**

**First Quarter, 2004**

**Second Quarter, 2004**

**Third Quarter, 2004**

**Fourth Quarter, 2004**

## TURKEY POINT SITE

## Offsite Dose Calculation Manual Sampling

First Quarter, 2004

<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	2
4.b. 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 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.

The marine fauna listed in this report were collected in part, under Florida FWC SAL030.



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

<u>Sample Site</u>	<u>Deployment 09-Dec-03 Collection 17-Mar-04</u>	<u>Sample Site</u>	<u>Deployment 09-Dec-03 Collection 17-Mar-04</u>
N-2	5.5 $\pm$ 0.2	WSW-8	4.9 $\pm$ 0.2
N-7	4.5 $\pm$ 0.2		
N-10	5.1 $\pm$ 0.2	SW-1	4.5 $\pm$ 0.2
		SW-8	5.3 $\pm$ 0.2
NNW-2	4.4 $\pm$ 0.2		
NNW-10	5.1 $\pm$ 0.2	SSW-5	4.8 $\pm$ 0.2
		SSW-10	4.7 $\pm$ 0.2
NW-1	6.2 $\pm$ 0.2		
NW-5	4.5 $\pm$ 0.2	S-5	4.5 $\pm$ 0.2
NW-10	7.6 $\pm$ 0.3	S-10	5.2 $\pm$ 0.2
WNW-10	6.2 $\pm$ 0.2	SSE-1	4.6 $\pm$ 0.2
		SSE-10	5.7 $\pm$ 0.2
W-1	6.4 $\pm$ 0.2		
W-5	5.1 $\pm$ 0.2	NNE-22	5.9 $\pm$ 0.2
W-9	4.7 $\pm$ 0.2		

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>
06-Jan-04	<0.01	<0.01	<0.02 (A)	<0.01	<0.02
12-Jan-04	<0.02	<0.02	<0.02 (B)	<0.02	<0.02
21-Jan-04	<0.01 (D)	<0.01	<0.02 (C)	<0.01	<0.01
28-Jan-04	<0.02	<0.03	<0.03	<0.03	<0.03
04-Feb-04	<0.02	<0.02	<0.02	<0.02	<0.02
11-Feb-04	<0.01	<0.01	<0.01	<0.01	<0.01
18-Feb-04	<0.02	<0.02	<0.02	<0.02	<0.02
24-Feb-04	<0.02	<0.02	<0.02	<0.02	<0.02
02-Mar-04	<0.02	<0.02	<0.02	<0.02	<0.02
09-Mar-04	<0.02	<0.02	<0.02	<0.02	<0.02
15-Mar-04	<0.02	<0.02	<0.02	<0.02	<0.02 (E)
23-Mar-04	<0.01	<0.01	<0.02	<0.02	<0.02
29-Mar-04	<0.02 (F)	<0.02	<0.02	<0.02	<0.02

- (A) Breaker had flipped, run time estimated at 179 hours out of 189.
- (B) Breaker had flipped, run time estimated at 139 hours out of 145.
- (C) Breaker had flipped, run time estimated at 144 hours out of 212, breaker inside hut was replaced.
- (D) Pump failed. Run time estimated at 195 hours out of 212.
- (E) Pump failed. Run time estimated at 128 hours out of 145.
- (F) Pump found running in reverse. Pump was replaced. Forward run time estimated at 53 hours out of 141.

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

Collection Date	Sample Sites				
	T51	T57	T58	T64	T72
06-Jan-04	0.014 ± 0.002	0.012 ± 0.002	0.010 ± 0.002 (A)	0.011 ± 0.002	0.011 ± 0.002
12-Jan-04	0.015 ± 0.002	0.012 ± 0.002	0.013 ± 0.002 (B)	0.016 ± 0.002	0.014 ± 0.002
21-Jan-04	0.022 ± 0.002 (D)	0.020 ± 0.002	0.024 ± 0.003 (C)	0.022 ± 0.002	0.021 ± 0.002
28-Jan-04	0.022 ± 0.002	0.027 ± 0.003	0.025 ± 0.002	0.024 ± 0.003	0.031 ± 0.003
04-Feb-04	0.012 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.010 ± 0.002
11-Feb-04	0.013 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.012 ± 0.002
18-Feb-04	0.010 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.010 ± 0.002
24-Feb-04	0.018 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.023 ± 0.003	0.019 ± 0.002
02-Mar-04	0.015 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.017 ± 0.002	0.016 ± 0.002
09-Mar-04	0.020 ± 0.002	0.017 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.020 ± 0.002
15-Mar-04	0.013 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.018 ± 0.002	0.018 ± 0.003
23-Mar-04	0.012 ± 0.002	0.012 ± 0.002	0.014 ± 0.002	0.013 ± 0.002	0.013 ± 0.002 (E)
29-Mar-04	0.011 ± 0.005 (F)	0.008 ± 0.002	0.011 ± 0.002	0.014 ± 0.002	0.008 ± 0.002
Mean:	0.015 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.015 ± 0.001

(A) Breaker had flipped, run time estimated at 179 hours out of 189.

(B) Breaker had flipped, run time estimated at 139 hours out of 145.

(C) Breaker had flipped, run time estimated at 144 hours out of 212, breaker inside hut was replaced.

(D) Pump failed. Run time estimated at 195 hours out of 212.

(E) Pump failed. Run time estimated at 128 hours out of 145.

(F) Pump found running in reverse. Pump was replaced. Forward run time estimated at 53 hours out of 141.

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

First Quarter, 2004

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
T51	0.1638 ± 0.0143	<0.0316	<0.0015	<0.0013	<0.0577
T57	0.1742 ± 0.0172	<0.0296	<0.0017	<0.0011	<0.0606
T58	0.1997 ± 0.0123	<0.0220	<0.0012	<0.0008	0.0203 ± 0.0038
T64	0.1928 ± 0.0132	<0.0171	<0.0011	<0.0011	0.0233 ± 0.0049
T72	0.1706 ± 0.0182	<0.0122	<0.0019	<0.0015	0.0247 ± 0.0062

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	I-131	Cs-134	Cs-137	Ba-140
									Nb-95 (A)				La-140 (B)
T42	28-Jan-04	<119	266 ± 34	<4	<3	<7	<4	<8	<6	<5	<4	<3	<7
	25-Feb-04	<122	278 ± 29	<4	<4	<7	<4	<8	<6	<4	<4	<3	<9
	17-Mar-04	<125	294 ± 30	<3	<3	<6	<4	<10	<6	<6	<3	<4	<5
T67	27-Jan-04	<119	127 ± 45	<5	<5	<11	<6	<9	<9	<7	<6	<7	<5
	25-Feb-04	<122	112 ± 23	<4	<4	<8	<4	<7	<7	<4	<3	<3	<9
	18-Mar-04	<125	121 ± 29	<3	<3	<6	<4	<8	<4	<5	<4	<4	<5
T81	28-Jan-04	131 ± 23	254 ± 31	<3	<4	<7	<5	<9	<7	<5	<4	<4	<8
	25-Feb-04	74 ± 23	260 ± 43	<5	<4	<12	<5	<14	<11	<6	<6	<5	<8
	17-Mar-04	104 ± 24	289 ± 45	<5	<6	<12	<6	<9	<10	<7	<5	<4	<10

(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)

<u>Sample Site</u>	<u>Collection 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>Th-232</u>	<u>U-238</u>
T42	28-Jan-04	<61	136 ± 43	<7	<6	<7	<6	<448	857 ± 11	<30	309 ± 121
T67	28-Jan-04	<115	639 ± 76	<12	<12	<14	<14	1579 ± 361	1327 ± 22	<62	1169 ± 306
T81	28-Jan-04	<145	345 ± 95	<15	<18	<16	<15	<2688	973 ± 23	<82	1114 ± 391

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

<u>Sample Site</u>	<u>Collection 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>
T67	23-Mar-04	1209 ± 158	<19	<20	<41	<21	<42	<21	<16	<396	<73
T81	This sample has not yet been collected.										

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

<u>Sample Site</u>	<u>Collection 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>
T67	18-Mar-04	2554 ± 141	<13	<13	<25	<14	<30	<13	<13	<211	<51
T81	18-Mar-04	2539 ± 139	<19	<19	<42	<21	<52	<20	<19	346 ± 98	<69

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	28-Jan-04	1490 ± 42	2804 ± 82	<6	<6	53 ± 4	<994	233 ± 73
	25-Feb-04	1327 ± 81	3443 ± 170	<12	<15	38 ± 7	<1666	<212
	17-Mar-04	1554 ± 47	2286 ± 75	<9	<6	41 ± 4	<995	<131
T41	28-Jan-04	1341 ± 84	5927 ± 224	<15	<15	36 ± 7	<2162	<239
	24-Feb-04	1488 ± 94	4511 ± 186	<15	<16	64 ± 9	<2069	<298
	17-Mar-04	1689 ± 44	5733 ± 91	<8	<6	12 ± 3	618 ± 176	<131
T67	27-Jan-04	924 ± 59	2282 ± 113	<12	<9	<10	<788	<290
	25-Feb-04	1011 ± 75	2960 ± 182	<15	<17	<14	<2189	<278
	18-Mar-04	1582 ± 103	3757 ± 208	<20	<18	<22	<2294	<286

## TURKEY POINT SITE

## Offsite Dose Calculation Manual Sampling

Second Quarter, 2004

<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	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 and with greater than a 50% error term are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

The marine fauna listed in this report were collected in part, under Florida FWC SAL030.

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

Sample Site	Deployment 17-Mar-04 Collection 08-Jun-04	Sample Site	Deployment 17-Mar-04 Collection 08-Jun-04
N-2	5.5 $\pm$ 0.2	W-9	4.9 $\pm$ 0.2
N-7	4.8 $\pm$ 0.2	WSW-8	5.0 $\pm$ 0.2
N-10	5.5 $\pm$ 0.2	SW-1	5.1 $\pm$ 0.2
NNW-2	4.4 $\pm$ 0.2	SW-8	5.9 $\pm$ 0.2
NNW-10	5.6 $\pm$ 0.2	SSW-5	4.8 $\pm$ 0.2
NW-1	6.7 $\pm$ 0.3	SSW-10	4.9 $\pm$ 0.2
NW-5	4.4 $\pm$ 0.2	S-5	4.8 $\pm$ 0.2
NW-10	7.7 $\pm$ 0.3	S-10	A
WNW-10	6.2 $\pm$ 0.2	SSE-1	4.8 $\pm$ 0.2
W-1	6.9 $\pm$ 0.3	SSE-10	5.9 $\pm$ 0.2
W-5	5.3 $\pm$ 0.2	NNE-22	6.4 $\pm$ 0.2

A – The TLD at site S-10 was missing when collection was attempted. A new TLD 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>
06-Apr-04	<0.01	<0.02	<0.02 <sup>A</sup>	<0.02	<0.02
12-Apr-04	<0.03	<0.03	<0.03	<0.03	<0.03
20-Apr-04	<0.01	<0.01	<0.01	<0.01	<0.01
27-Apr-04	<0.01	<0.01	<0.01	<0.01	<0.01
04-May-04	<0.01	<0.01	<0.01	<0.01	<0.01
12-May-04	<0.01	<0.01	<0.01	<0.01	<0.01
19-May-04	<0.02	<0.02	<0.02	<0.02	<0.02
25-May-04	<0.01	<0.01	<0.01	<0.01	<0.01
02-Jun-04	<0.01	<0.01	<0.01	<0.02	<0.02
08-Jun-04	<0.01	<0.01	<0.01	<0.01	<0.01
15-Jun-04	<0.01 <sup>B</sup>	<0.01	<0.01	<0.01	<0.02
22-Jun-04	<0.01	<0.01	<0.01	<0.01	<0.01
29-Jun-04	<0.02	<0.02 <sup>C</sup>	<0.02	<0.02	<0.02

- A. The power was off at various times during the sampling period due to a failed breaker. Run time was estimated at 51 hours out of 194. The breaker was replaced.
- B. The power was off for four hours at the beginning of the sampling period due to the replacement of a failed power cord on the pump.
- C. The power was off at the end of the sampling period due to a loss of power at the site. Run time was estimated at 158 hours out of 168.

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

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
06-Apr-04	0.017 ± 0.002	0.022 ± 0.002	0.017 ± 0.002 <sup>A</sup>	0.016 ± 0.002	0.018 ± 0.002
12-Apr-04	0.025 ± 0.003	0.025 ± 0.003	0.022 ± 0.003	0.023 ± 0.003	0.025 ± 0.003
20-Apr-04	0.018 ± 0.002	0.019 ± 0.002	0.020 ± 0.002	0.018 ± 0.002	0.018 ± 0.002
27-Apr-04	0.016 ± 0.002	0.016 ± 0.002	0.017 ± 0.002	0.018 ± 0.002	0.014 ± 0.002
04-May-04	0.011 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.010 ± 0.002	0.010 ± 0.002
12-May-04	0.019 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.026 ± 0.002	0.020 ± 0.002
19-May-04	0.016 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.014 ± 0.002	0.018 ± 0.002
25-May-04	0.022 ± 0.003	0.019 ± 0.002	0.019 ± 0.002	0.019 ± 0.003	0.016 ± 0.002
02-Jun-04	0.016 ± 0.002	0.022 ± 0.002	0.018 ± 0.002	0.019 ± 0.002	0.021 ± 0.002
08-Jun-04	0.010 ± 0.002	0.008 ± 0.002	0.011 ± 0.002	0.011 ± 0.002	0.012 ± 0.002
15-Jun-04	0.017 ± 0.002 <sup>B</sup>	0.013 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.013 ± 0.002
22-Jun-04	0.016 ± 0.002	0.015 ± 0.002	0.013 ± 0.002	0.022 ± 0.002	0.019 ± 0.002
29-Jun-04	0.027 ± 0.003	0.024 ± 0.003 <sup>C</sup>	0.022 ± 0.002	0.022 ± 0.002	0.026 ± 0.003
Mean:	0.018 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.018 ± 0.001

- A. The power was off at various times during the sampling period due to a failed breaker. Run time was estimated at 51 hours out of 194. The breaker was replaced.
- B. The power was off for four hours at the beginning of the sampling period due to the replacement of a failed power cord on the pump.
- C. The power was off at the end of the sampling period due to a loss of power at the site. Run time was estimated at 158 hours out of 168.

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

## Second Quarter, 2004

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
T51	0.1797 ± 0.0141	<0.0319	<0.0014	<0.0012	<0.0565
T57	0.1525 ± 0.0172	<0.0407	<0.0013	<0.0012	<0.0531
T58	0.1531 ± 0.0140	<0.0166	<0.0012	<0.0012	0.0183 ± 0.0052
T64	0.1705 ± 0.0129	<0.0220	<0.0013	<0.0009	0.0267 ± 0.0042
T72	0.1831 ± 0.0133	<0.0208	<0.0011	<0.0010	0.0258 ± 0.0053

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 (A)</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ba-140 La-140 (B)</u>
T42	13-Apr-04	<119	326 ± 30	<3	<3	<6	<4	<9	<7	<4	<4	<4	<11
	19-May-04	<121	421 ± 34	<3	<3	<7	<5	<7	<7	<4	<4	<5	<5
	09-Jun-04	<124	334 ± 38	<3	<3	<7	<4	<7	<6	<4	<3	<4	<8
T67	12-Apr-04	<124	132 ± 31	<4	<6	<10	<5	<11	<9	<7	<6	<6	<10
	19-May-04	<121	172 ± 30	<3	<4	<7	<3	<7	<5	<5	<4	<4	<6
	08-Jun-04	<124	327 ± 49	<5	<5	<10	<6	<13	<10	<6	<4	<6	<13
T81	13-Apr-04	<119	359 ± 37	<4	<3	<9	<5	<5	<6	<4	<4	<4	<6
	19-May-04	<121	394 ± 34	<4	<3	<7	<5	<8	<5	<4	<4	<4	<8
	09-Jun-04	<124	300 ± 49	<5	<5	<9	<6	<11	<10	<6	<5	<6	<15

(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)

<u>Sample Site</u>	<u>Collection 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>
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These samples were previously collected.

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

<u>Sample Site</u>	<u>Collection 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>
T67	This sample was previously collected.										
T81	24-Jun-04	1601 ± 252	<28	<32	<81	<32	<64	<25	<26	562 ± 276	<120

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

<u>Sample Site</u>	<u>Collection 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>
T67	This sample was previously collected										
T81	This sample was 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	12-Apr-04	1057 ± 83	4372 ± 197	<17	<15	83 ± 10	<2082	303 ± 139
	19-May-04	1367 ± 106	3443 ± 227	<14	<18	76 ± 11	<2239	<389
	09-Jun-04	551 ± 50	3056 ± 148	<10	<13	41 ± 7	<1511	<255
T41	12-Apr-04	857 ± 43	4830 ± 110	<7	<8	26 ± 4	<1022	<130
	19-May-04	646 ± 69	5438 ± 253	<15	<16	<20	<2185	<319
	09-Jun-04	468 ± 27	4661 ± 96	<5	<6	15 ± 3	<853	<104
T67	12-Apr-04	760 ± 86	3390 ± 203	<16	<17	<16	<2106	<302
	19-May-04	1634 ± 93	3893 ± 202	<15	<15	<13	<2257	649 ± 199
	08-Jun-04	1082 ± 68	3183 ± 144	<12	<10	37 ± 7	<724	<267

TURKEY POINT SITE  
 Offsite Dose Calculation Manual Sampling  
 Third Quarter, 2004

<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	0
4.a.2. Fish	Semiannually	2	0
4.b. 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 and with greater than a 50% error term are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

The marine fauna listed in this report were collected in part, under Florida FWC SAL030.

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

Sample Site	Deployment 08-Jun-04 Collection 21-Sep-04	Sample Site	Deployment 08-Jun-04 Collection 21-Sep-04
N-2	$5.3 \pm 0.2$	W-9	$4.9 \pm 0.2$
N-7	$4.5 \pm 0.2$	WSW-8	$5.2 \pm 0.2$
N-10	$5.2 \pm 0.2$ (A)	SW-1	$5.5 \pm 0.2$
NNW-2	$4.6 \pm 0.2$	SW-8	$5.9 \pm 0.2$
NNW-10	$5.8 \pm 0.2$	SSW-5	$5.4 \pm 0.2$
NW-1	$6.6 \pm 0.2$	SSW-10	$5.3 \pm 0.2$ (A)
NW-5	$4.6 \pm 0.2$	S-5	$5.0 \pm 0.2$
NW-10	(B)	S-10	$5.9 \pm 0.2$
WNW-10	$6.8 \pm 0.2$	SSE-1	$5.0 \pm 0.2$
W-1	$6.8 \pm 0.2$	SSE-10	$5.7 \pm 0.2$
W-5	$5.8 \pm 0.2$	NNE-22	$6.3 \pm 0.2$

(A) TLDs were found on the ground upon collection.

(B) TLD at site NW-10 was missing when collection was attempted. A new TLD 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>
06-Jul-04	<0.02	<0.02	<0.02	<0.02	<0.02
13-Jul-04	<0.02	<0.02	<0.02	<0.03	<0.02
21-Jul-04	<0.01	<0.01	<0.01	<0.01	<0.01
26-Jul-04	<0.02	<0.02	<0.02	<0.02	<0.02
02-Aug-04	<0.01	<0.01	<0.01	<0.01	<0.01
09-Aug-04	<0.02	<0.02	<0.02	<0.02	<0.02
17-Aug-04	<0.02	<0.02	<0.02	<0.02	<0.02
24-Aug-04	<0.02	<0.02	<0.02	<0.02	<0.02
30-Aug-04	<0.03	<0.03	<0.03	<0.03	<0.03
07-Sep-04	<0.01	<0.01	<0.01	<0.01	<0.01
14-Sep-04	<0.01	<0.01	<0.01	<0.01	<0.01
21-Sep-04	<0.02	<0.02	<0.02	<0.02	<0.02
29-Sep-04	<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
06-Jul-04	0.016 ± 0.002	0.015 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.017 ± 0.002
13-Jul-04	0.021 ± 0.002	0.024 ± 0.003	0.023 ± 0.003	0.026 ± 0.003	0.023 ± 0.003
21-Jul-04	0.014 ± 0.002	0.011 ± 0.002	0.009 ± 0.002	0.015 ± 0.002	0.010 ± 0.002
26-Jul-04	0.015 ± 0.003	0.015 ± 0.003	<0.007 (A)	0.013 ± 0.003	0.015 ± 0.003
02-Aug-04	0.006 ± 0.002	0.004 ± 0.001	0.007 ± 0.002	0.008 ± 0.002	0.012 ± 0.002
09-Aug-04	0.012 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.011 ± 0.002
17-Aug-04	0.014 ± 0.002	0.015 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.016 ± 0.002
24-Aug-04	0.010 ± 0.002	0.010 ± 0.002	0.013 ± 0.002	0.011 ± 0.002	0.014 ± 0.002
30-Aug-04	0.005 ± 0.002	0.007 ± 0.002	0.009 ± 0.002	0.012 ± 0.002	0.011 ± 0.002
07-Sep-04	0.009 ± 0.002	0.007 ± 0.002	0.005 ± 0.001	0.009 ± 0.002	0.008 ± 0.002
14-Sep-04	0.007 ± 0.002	0.010 ± 0.002	0.008 ± 0.002	0.008 ± 0.002	0.009 ± 0.002
21-Sep-04	0.013 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.014 ± 0.002	0.015 ± 0.002
29-Sep-04	0.017 ± 0.002	0.014 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.013 ± 0.002
Mean:	0.012 ± 0.001	0.012 ± 0.001	<0.011	0.013 ± 0.001	0.013 ± 0.001

(A) The air hose leading to the particulate filter became disconnected sometime during the collection period. The gas meter measured volume was used for calculation purposes but the actual volume pulled through the particulate filter is unknown.

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

Sample Site	Third Quarter, 2004				
	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
T51	0.1020 ± 0.0112	<0.0278	<0.0015	<0.0011	<0.0485
T57	0.1086 ± 0.0103	<0.0320	<0.0009	<0.0009	<0.0528
T58	0.1080 ± 0.0127	<0.0236	<0.0016	<0.0011	<0.0417
T64	0.1317 ± 0.0112	<0.0198	<0.0009	<0.0010	0.0272 ± 0.0041
T72	0.1136 ± 0.0095	<0.0199	<0.0009	<0.0007	0.0227 ± 0.0034

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 (A)</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ba-140 La-140 (B)</u>
T42	14-Jul-04	<127	403 ± 37	<4	<4	<7	<5	<7	<7	<5	<4	<5	<9
	09-Aug-04	<127	322 ± 34	<3	<3	<7	<3	<7	<7	<4	<4	<3	<7
	22-Sep-04	<126	330 ± 32	<2	<3	<6	<4	<9	<7	<4	<4	<4	<8
T67	14-Jul-04	<126	405 ± 49	<5	<6	<11	<8	<11	<9	<6	<6	<7	<11
	09-Aug-04	<127	133 ± 31	<5	<7	<11	<6	<9	<10	<7	<7	<6	<11
	21-Sep-04	<126	156 ± 40	<4	<4	<9	<5	<10	<8	<5	<6	<4	<7
T81	14-Jul-04	<126	431 ± 35	<4	<4	<9	<4	<8	<6	<5	<5	<4	<9
	09-Aug-04	<127	448 ± 41	<4	<4	<7	<3	<7	<7	<5	<4	<4	<4
	21-Sep-04	<126	418 ± 35	<2	<3	<5	<4	<9	<5	<5	<3	<3	<5

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

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

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

Sample 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>Th-232</u>	<u>U-235</u>	<u>U-238</u>
T42	22-Sep-04	<101	222 ± 46	<9	<11	<11	<10	<657	743 ± 28	<39	<97	<403
T67	21-Sep-04	<163	638 ± 107	<15	<17	<20	<16	<1468	1292 ± 26	50 ± 18	<141	1833 ± 433
T81	21-Sep-04	<137	369 ± 63	<13	<11	<14	<12	<815	922 ± 22	<52	<118	<570

4.a.1. CRUSTACEA - (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.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>
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)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137	Pb-210	Ra-226
T40	14-Jul-04	564 ± 42	3543 ± 130	<11	<12	<11	<1388	<233
	09-Aug-04	1208 ± 42	5639 ± 114	<8	<8	39 ± 4	<1018	<136
	21-Sep-04	1622 ± 117	4716 ± 220	<18	<17	94 ± 11	<2574	<361
T41	14-Jul-04	595 ± 74	5195 ± 220	<15	<19	31 ± 11	<2247	<290
	09-Aug-04	1205 ± 103	5280 ± 239	<19	<18	<18	<2498	<316
	21-Sep-04	1304 ± 92	4012 ± 192	<13	<14	61 ± 8	<1826	<304
T67	14-Jul-04	753 ± 85	3509 ± 185	<17	<19	142 ± 11	<1943	541 ± 137
	09-Aug-04	1122 ± 84	4726 ± 178	<13	<13	<12	<681	<250
	21-Sep-04	985 ± 73	3146 ± 212	<15	<17	<15	<2328	<364

## TURKEY POINT SITE

## Offsite Dose Calculation Manual Specifications Sampling

Fourth Quarter, 2004

<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	2	2
4.a.2. Fish	Semiannually	1	2
4.b. Broadleaf Vegetation	Monthly	3	9
			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 and with greater than a 50% error term are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

The marine fauna listed in this report were collected in part, under Florida FWC SAL030.

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

<u>Sample Site</u>	<u>Deployment 21-Sep-04 Collection 13-Dec-04</u>	<u>Sample Site</u>	<u>Deployment 21-Sep-04 Collection 13-Dec-04</u>
N-2	5.7 $\pm$ 0.2	WSW-8	5.0 $\pm$ 0.2
N-7	4.9 $\pm$ 0.2		
N-10	5.1 $\pm$ 0.2	SW-1	5.3 $\pm$ 0.2
		SW-8	5.6 $\pm$ 0.2
NNW-2	4.6 $\pm$ 0.2		
NNW-10	6.0 $\pm$ 0.2	SSW-5	5.1 $\pm$ 0.2
		SSW-10	5.2 $\pm$ 0.2
NW-1	6.8 $\pm$ 0.2		
NW-5	4.7 $\pm$ 0.2	S-5	4.9 $\pm$ 0.2
NW-10	7.3 $\pm$ 0.3	S-10	5.7 $\pm$ 0.2
WNW-10	6.5 $\pm$ 0.2	SSE-1	4.6 $\pm$ 0.2
		SSE-10	5.9 $\pm$ 0.2
W-1	6.9 $\pm$ 0.3		
W-5	5.6 $\pm$ 0.2	NNE-22	6.1 $\pm$ 0.2
W-9	5.1 $\pm$ 0.2		

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (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>
06-Oct-04	<0.01	<0.01	<0.01	<0.01	<0.01
12-Oct-04	<0.01	<0.01	<0.01	<0.02	<0.01
19-Oct-04	<0.02	<0.02	<0.02	<0.02	<0.02
28-Oct-04	<0.01	<0.01	<0.01	<0.01	<0.01
04-Nov-04	<0.01	<0.01	<0.01	<0.01	<0.01
09-Nov-04	<0.03	<0.03	<0.03	<0.03	<0.03
16-Nov-04	<0.02	<0.02	<0.02	<0.02	<0.02
24-Nov-04	<0.01	<0.01	<0.01	<0.01	<0.01
30-Nov-04	<0.01	<0.01	<0.01	<0.01	<0.01
08-Dec-04	<0.01	<0.01	<0.01	<0.01	<0.01
13-Dec-04	<0.02	<0.02	<0.02	<0.02	<0.02
20-Dec-04	<0.02	<0.02	<0.02	<0.02	<0.02
28-Dec-04	<0.01	<0.01	<0.01	<0.01	<0.01

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>
06-Oct-04	0.010 ± 0.002	0.010 ± 0.002	0.008 ± 0.002	0.009 ± 0.002	0.009 ± 0.002
12-Oct-04	0.014 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.017 ± 0.002	0.013 ± 0.002
19-Oct-04	0.014 ± 0.002	0.021 ± 0.002	0.014 ± 0.002	0.019 ± 0.002	0.018 ± 0.002
28-Oct-04	0.009 ± 0.002	0.016 ± 0.002	0.009 ± 0.001	0.014 ± 0.002	0.014 ± 0.002
04-Nov-04	0.012 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.012 ± 0.002
09-Nov-04	0.016 ± 0.003	0.011 ± 0.002	0.014 ± 0.002	0.021 ± 0.003	0.013 ± 0.003
16-Nov-04	0.009 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.012 ± 0.002	0.011 ± 0.002
24-Nov-04	0.013 ± 0.002	0.011 ± 0.002	0.013 ± 0.002	0.014 ± 0.002	0.014 ± 0.002
30-Nov-04	0.018 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.015 ± 0.002
08-Dec-04	0.020 ± 0.002	0.022 ± 0.002	0.016 ± 0.002	0.021 ± 0.002	0.019 ± 0.002
13-Dec-04	0.012 ± 0.002	0.023 ± 0.003	0.013 ± 0.003	0.018 ± 0.003	0.018 ± 0.003
20-Dec-04	0.019 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.014 ± 0.002	0.014 ± 0.002
28-Dec-04	0.009 ± 0.002	0.011 ± 0.002	0.013 ± 0.002	0.016 ± 0.002	0.015 ± 0.002
Mean:	0.013 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.016 ± 0.001	0.014 ± 0.001

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

Fourth Quarter, 2004

<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	0.1548 ± 0.0140	<0.0326	<0.0019	<0.0013	<0.0595
T57	0.1602 ± 0.0135	<0.0255	<0.0020	<0.0010	<0.0563
T58	0.1664 ± 0.0168	<0.0257	<0.0016	<0.0011	<0.0514
T64	0.1763 ± 0.0120	<0.0211	<0.0008	<0.0010	0.0304 ± 0.0041
T72	0.1908 ± 0.0133	<0.0185	<0.0010	<0.0009	0.0248 ± 0.0037



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 (A)</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ba-140 La-140 (B)</u>
T42	12-Oct-04	<123	215 ± 24	<2	<2	<5	<3	<5	<4	<3	<2	<3	<4
	09-Nov-04	<125	237 ± 29	<4	<3	<8	<4	<8	<6	<5	<3	<4	<7
	08-Dec-04	<123	332 ± 31	<3	<3	<6	<4	<8	<6	<6	<4	<4	<4
T67	12-Oct-04	<123	219 ± 27	<3	<4	<9	<5	<9	<6	<4	<4	<4	<7
	09-Nov-04	<125	192 ± 29	<3	<3	<6	<3	<8	<6	<5	<4	<4	<7
	08-Dec-04	<123	158 ± 23	<4	<3	<6	<5	<7	<7	<6	<5	<4	<7
T81	12-Oct-04	<123	212 ± 43	<4	<4	<9	<4	<8	<8	<6	<5	<4	<4
	09-Nov-04	<125	327 ± 33	<3	<4	<6	<4	<7	<5	<4	<4	<4	<5
	08-Dec-04	78 ± 23	192 ± 46	<7	<6	<12	<7	<10	<11	<9	<5	<6	<10

(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)

<u>Sample Site</u>	<u>Collection 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>
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These samples were previously collected.

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

<u>Sample Site</u>	<u>Collection 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>
T67	03-Dec-04	930 ± 145	<21	<23	<57	<19	<44	<25	<19	679 ± 179	<81
T81	02-Dec-04	1541 ± 170	<26	<25	<54	<22	<57	<24	<18	<515	<104

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

<u>Sample Site</u>	<u>Collection 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>
T67	22-Dec-04	3114 ± 279	<30	<29	<72	<31	<60	<36	<32	<588	<119
T81	28-Dec-04	2462 ± 296	<25	<28	<61	<29	<59	<28	<28	844 ± 292	<117

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-Oct-04	1111 ± 78	3711 ± 183	<13	<13	92 ± 10	<1851	287 ± 102
	09-Nov-04	1829 ± 112	4896 ± 251	<17	<19	181 ± 13	<2377	<378
	08-Dec-04	1785 ± 44	4455 ± 82	<9	<5	96 ± 4	1062 ± 181	<129
T41	12-Oct-04	1167 ± 85	5058 ± 184	<16	<13	62 ± 8	<778	<276
	09-Nov-04	2148 ± 100	5922 ± 196	<18	<13	18 ± 5	<803	<280
	08-Dec-04	1890 ± 52	3760 ± 105	<12	<8	82 ± 5	<1153	554 ± 85
T67	12-Oct-04	641 ± 77	2556 ± 170	<12	<17	<13	<2113	<352
	09-Nov-04	1842 ± 95	3056 ± 156	<19	<16	<13	<2030	<318
	08-Dec-04	826 ± 98	3435 ± 197	<28	<17	<18	<2494	<379

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ATTACHMENT C

RESULTS FROM THE INTERLABORATORY

COMPARISON PROGRAM 2004

DEPARTMENT OF ENERGY

QAP 60, June 2004

AND

MAPEP 12, December 2004

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**DOE-QAP 60 RESULTS**

Radionuclide	Reported Value	Reported Error	EML Value	EML Error	Reported EML	Evaluation
<b>Matrix: AI Air Filter Bq/filter</b>						
Co60	37.850	0.130	35.400	0.850	1.069	A
Cs137	17.060	0.100	18.200	0.402	0.937	A
Cs137	30.080	0.100	26.400	0.860	1.139	A
Am241	0.130	0.020	0.105	0.002	1.244	A
Gross Beta	3.000	0.050	2.850	0.280	1.053	A
<b>Matrix: SO Soil Bq/k</b>						
K40	616.000	8.000	539.000	29.110	1.143	A
Cs137	1509.000	3.000	1323.000	66.170	1.141	A
Th234	96.500	5.300	84.000	5.960	1.149	A
U238	98.000	8.000	89.730	4.220	1.092	A
Am241	14.600	1.000	13.000	0.430	1.123	A
<b>Matrix: VE Vegetation Bq/kg</b>						
K40	800.000	10.000	720.000	37.920	1.111	A
Co60	15.200	0.600	14.470	0.640	1.050	A
Cs137	634.000	3.000	584.670	29.230	1.084	A
Am241	5.400	0.800	4.930	0.290	1.095	A
<b>Matrix: WA Water Bq/L</b>						
H3	237.170	4.750	186.600	3.300	1.271	A
Co60	160.100	0.500	163.200	5.900	0.981	A
Sr90	4.640	0.270	4.760 **	0.500	0.975	A
Cs137	52.040	0.490	51.950	2.700	1.002	A
Am241	1.340	0.300	1.3100	0.040	1.023	A
Gross Alpha	328.400	8.400	326.000	32.000	1.007	A
Gross Beta	1009.000	9.100	1170.000	117.000	0.862	A

\*\* = Grand mean average used in lieu of experimentally determined EML value

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

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DOE-MAPEP 12 RESULTS

Radionuclide	Result	Ref. Value	Flag (Evaluation)	Acceptance Range
<b>Matrix: RdF Air Filter Bq/filter</b>				
MN54	3.13	3	A	2.10 – 3.90
CO57	2.43	2.4	A	1.68 – 3.12
CO60	2.35	2.3	A	1.61 – 2.99
ZN65	4.59	4	A	2.80 – 5.20
CS134	2.22	2.9	W	2.03 – 3.77
CS137	1.90	2	A	1.40 – 2.60
 <b>Matrix: MaS Soil Bq/kg</b>				
K40	692	604	A	422.8 – 785.2
MN54	572	484.7	A	339.3 – 630.1
CO57	465	399.6	A	279.7 – 519.5
CO60	574	518	A	362.6 – 673.4
ZN65	835	699.3	A	489.5 – 909.1
CS134	408	414.4	A	290.1 – 538.7
CS137	948	836.2	A	585.3 - 1008
 <b>Matrix: MaW Water Bq/L</b>				
H3	90.5	83	A	58.1 – 107.9
MN54	262.1	267	A	186.9 – 347.1
CO57	168.3	185	A	129.5 – 240.5
CO60	158.1	163	A	114.1 – 211.9
NI63	91.4	100	A	70 - 130
ZN65	212.8	208	A	145.6 – 270.4
SR90	8.2	7	A	4.9 – 9.1
CS134	180.9	208	A	145.6 – 270.4
CS137	234.5	250	A	175 - 325

**Matrix: MaV Vegetation, Bq/sample :**

Not included in this round

**Matrix: GrF Filter Bq/sample**

Gross Beta	1.27	1.2	A	0.6 – 1.80
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Evaluation : A = Acceptable, W = Acceptable with Warning, N = Not Acceptable

From the MAPEP handbook:

Acceptance criteria were developed from a review of precision and accuracy data compiled by other PEPs, the analytical methods literature, from several MAPEP pilot studies, and from what is considered reasonable, acceptable, and achievable for routine analyses among the more experienced laboratories.