



April 15, 2014

L-2014-101
10 CFR 50.4
10 CFR 50.36

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

RE: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Annual Radiological Environmental
Operating Report for Calendar Year 2013

The enclosed report is being submitted pursuant to Technical Specification 6.9.1.8. The *Annual Radiological Environmental Operating Report* provides information summaries and analytical results of the Radiological Environmental Monitoring Program (REMP) for calendar year 2013.

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

Sincerely,

A handwritten signature in black ink that reads "Eric S. Katzman".

Eric S. Katzman
Licensing Manager
St. Lucie Plant

Enclosure

ESK/ttt

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2013
ANNUAL
RADIOLOGICAL ENVIRONMENTAL
OPERATING REPORT

ST. LUCIE PLANT
UNITS 1 & 2
LICENSE NOS. DPR-67, NPF-16
DOCKET NOS. 50-335, 50-389

Data Submitted by: Florida DOH

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Reviewed by:

JR

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

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I. INTRODUCTION

This report is submitted pursuant to Specification 6.9.1.8 of St. Lucie Unit 1 and St. Lucie Unit 2 Technical Specifications. The Annual Radiological Environmental Operating Report provides information, summaries and analytical results pertaining to the radiological environmental monitoring program for the calendar year indicated. This report covers surveillance activities meeting the requirements of Unit 1 and Unit 2 Technical Specifications.

II. RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

A. Purpose

The purpose of the radiological environmental monitoring program is to provide representative measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures to 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 St. Lucie Plant is conducted pursuant to the St. Lucie Units 1 and 2 Offsite Dose Calculation Manual (ODCM) Section 3/4.12.1, Monitoring Program.

1. Sample Locations, Types and Frequencies:

- a. Direct radiation gamma exposure rate is monitored continuously at 27 locations by thermoluminescent dosimeters (TLDs). TLDs are collected and analyzed quarterly.
- b. Airborne radioiodine and particulate samplers are operated continuously at five locations. Samples are collected and analyzed weekly. Analyses include Iodine-131, gross beta, and gamma isotopic measurements.
- c. Surface water samples are collected from two locations. Samples are collected and analyzed weekly and monthly, respectively. Analyses include gamma isotopic and tritium measurements.

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- d. Shoreline sediment samples are collected from two locations coinciding with the locations for surface water samples. Samples are collected and analyzed semi-annually. Sediment samples are analyzed by gamma isotopic measurements.
- e. Fish and invertebrate samples are collected from two locations. Samples are collected and analyzed semi-annually. Fish and invertebrate samples are analyzed by gamma isotopic measurements.
- f. Broad leaf vegetation samples are collected from three locations. Samples are collected and analyzed monthly. Broad leaf vegetation samples are analyzed by gamma isotopic measurements.

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

Note: Ground Water Protection, NEI Initiative: The program and results are described in Attachment D

2. Analytical Responsibility:

Radiological environmental monitoring for the St. Lucie Plant is conducted by the State of Florida, Department of Health (DOH), Bureau of Radiation Control (BRC). Samples are collected and analyzed by DOH personnel.

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

C. 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 or missing data, if any, are noted and explained in Table 1A. Samples not meeting the specified "A PRIORI" LLD, if any, are noted and explained in Table 1B. Analysis data for all specified samples analyzed during the surveillance period is provided in Attachment B.

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D. Land Use Census

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

E. Interlaboratory Comparison Program

The intercomparison program consists of participating in the DOE Mixed Analyte Performance Evaluation Program (MAPEP).

This program provides similar testing (matrices, nuclides, and levels) as the former EPA Interlaboratory Comparison Program and is referred to as the Mixed Analyte Performance Evaluation Program (MAPEP).

The samples are analyzed using the methods applicable to the REMP (gamma spectroscopy, Gross Beta, and Tritium for water).

From the MAPEP handbook:

Acceptance criteria were developed from a review of precision and accuracy data compiled by other performance evaluation programs (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.

The results for nuclides associated with the REMP are listed in ATTACHMENT C, RESULTS FROM THE INTERLABORATORY COMPARISON PROGRAM.

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III. DISCUSSION AND INTERPRETATION OF RESULTS

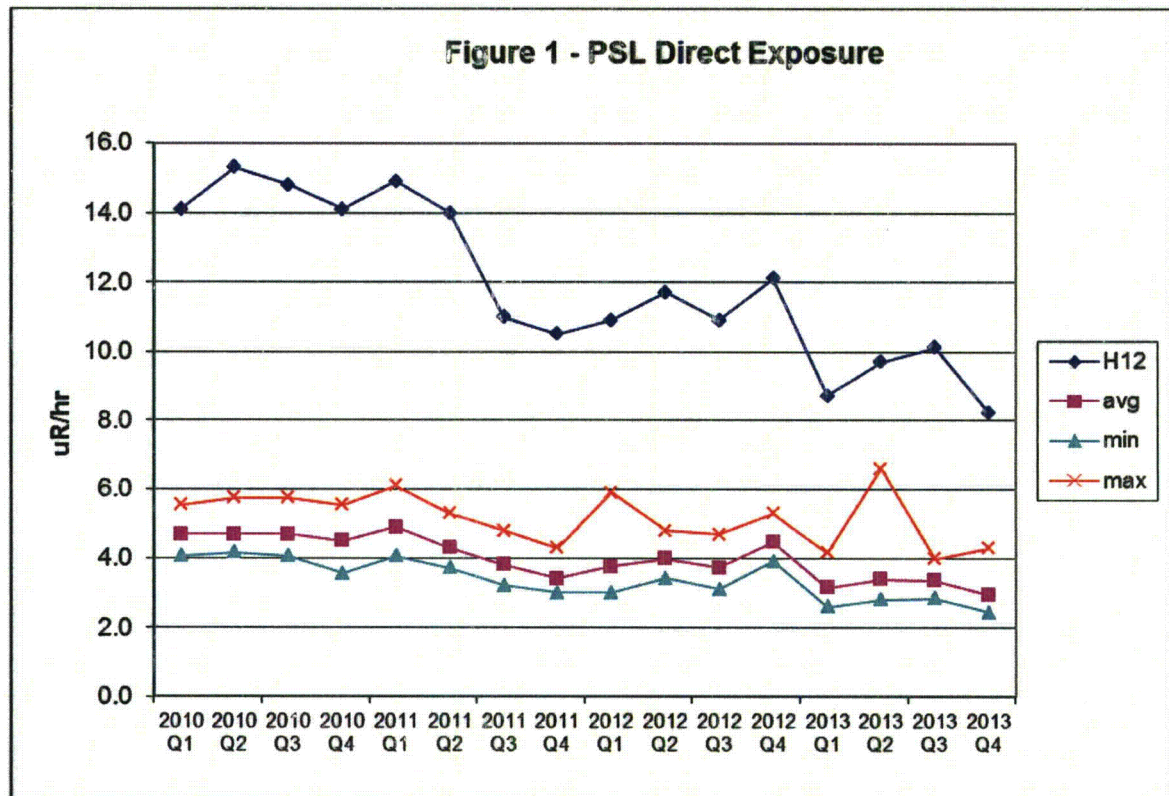
A. Reporting of Results

The Annual Radiological Environmental Operating Report contains the summaries, interpretations and information required by St. Lucie Plant ODCM. Table 1 provides a summary of the measurements made for the nuclides required by ODCM, Table 4.12-1, for all samples specified by Table 3.12-1. In addition, summaries are provided for other nuclides identified in the specified samples, including those not related to station operation. These include nuclides such as K-40, Th-232, Ra-226, and Be-7, which are common in the Florida environment.

B. Interpretation of Results

1. Direct Radiation:

The results of direct radiation monitoring are consistent with past measurements for the specified locations. 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 and are trended in Figure 1 below.



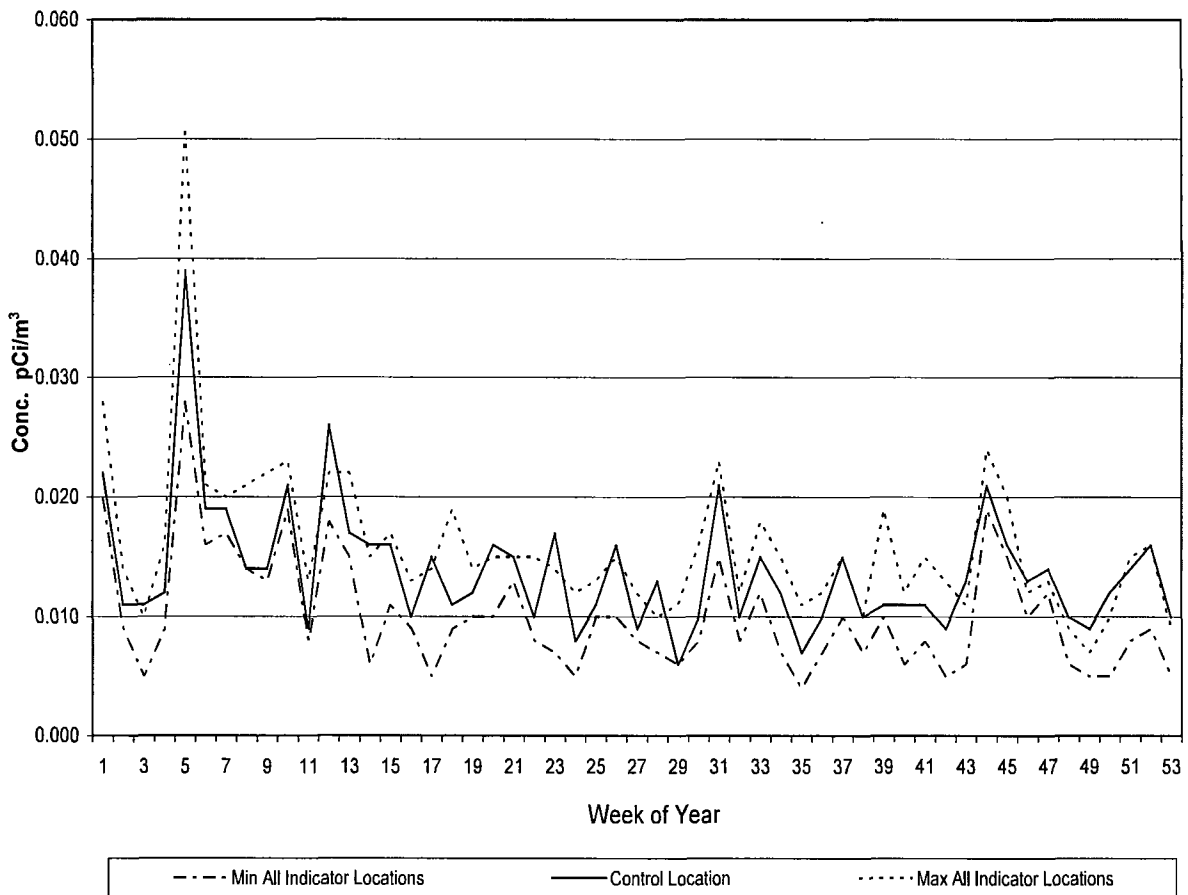
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2. Air Particulates/Radioiodine:

For results attributed to plant effluents:

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 and are trended in Figure 2 below.

**St. Lucie 2013 REMP
Gross Beta in Air, pCi/m³**



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3. Waterborne, Surface Water:

The results for radioactivity measurements in surface water are consistent with past measurements and with measurements made during the pre-operational surveillance program. Tritium was reported as present in four of the 53 indicator locations and none of the 12 control location surface water samples collected. The highest value was 4.2% of the required LLD listed in ODCM Table 4.12-1. There were no indications of any other nuclides that could be attributed to plant effluents. Results for surface water samples are summarized in Table 1.

4. Waterborne, Sediment and Food Products:

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

5. Broad Leaf Vegetation:

The results for radioactivity measurements in broad leaf vegetation are consistent with past measurements and with measurements made during the pre-operational surveillance program. There were no indications of any nuclides attributed to plant effluents. Results for broad leaf vegetation samples are summarized in Table 1.

6. Land Use Census:

During the annual 2013 Land Use Census, two new gardens were identified at 4.0 and 4.2 miles WNW from the plant. These new gardens were referenced in the 2013 PSL Annual Radioactive Effluent Release Report. The current garden located 2.0 miles WSW remains the closest garden to the plant.

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 percent greater than locations currently being sampled in the radiological environmental monitoring program were identified by the land use census.

7. Interlaboratory Comparison Program:

The State of Florida laboratory participated in MAPEP 28 and 29. These satisfied the requirements as directed in the PSL Offsite Dose Calculation Manual (ODCM) for the Interlaboratory Comparison Program.

The results are listed in Attachment C.

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C. Conclusions

The data obtained through the St. Lucie Plant radiological environmental monitoring program verifies that the levels of radiation and concentrations of radioactive materials in environmental samples, representing the highest potential exposure pathways to members of the public, are not being increased.

- The measured exposure rates are consistent with exposure rates that were observed during the pre-operational surveillance program.
- The results for air particulate/radioiodine samples are consistent with measurements that were made during the pre-operational surveillance program.
- The highest value of tritium in surface water was 4.2% of the required LLD listed in ODCM Table 4.12-1. There were no indications of any other nuclides that could be attributed to plant effluents.
- There were no indications of any nuclides in waterborne sediment or food products attributed to plant effluents.
- There were no indications of any nuclides in broad leaf vegetation attributed to plant effluents.

The measurements verify that the dose or dose commitment to members of the public, due to operation of St. Lucie Units 1 and 2, 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 St. Lucie Units 1 & 2, Docket No(s). 50-335 & 50-389
 Location of Facility St. Lucie, Florida, Reporting Period January 1 - December 31, 2013
 (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) ^b Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c Distance & Direction	Mean (f) ^b Range	
Exposure ^d Rate, 108	—	3.14 (104/104) 2.4 - 4.3	NW - 10 10 mi., NW	3.98 (4/4) 3.9 - 4.2	3.3 (4/4) 2.9 - 3.7

Number of Non-Routine Reported Measurements = 0

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 Name of Facility St. Lucie Units 1 & 2, Docket No(s). 50-335 & 50-389
 Location of Facility St. Lucie, Florida, Reporting Period January 1 - December 31, 2013
 (County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) ^b Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c	Mean (f) ^b	
			Distance & Direction	Range	
¹³¹ I, 265	0.012	<MDA	---	---	<MDA
Gross Beta, 265	0.0064	0.013 (211/212) 0.004 - 0.051	H-14 1 mile, SE	0.014 (52/53) 0.005 - 0.051	0.014 (53/53) 0.006 - 0.039
Composite Gamma Isotopic, 20					
⁷ Be	0.0006	0.1063 (16/16) 0.076 - 0.161	H-34 .5 mile, N	0.1158 (4/4) 0.076 - 0.161	0.1137 (4/4) 0.0923 - 0.1319
¹³⁴ Cs	0.0008	<MDA	<MDA	<MDA	<MDA
¹³⁷ Cs	0.0008	<MDA	<MDA	<MDA	<MDA
²¹⁰ Pb	---	0.0113 (16/16) 0.0065 - 0.0145	H-14 1 mile, SE	0.0145 (4/4) 0.0065 - 0.0145	0.0135 (4/4) 0.0119 - 0.0162

Be-7 & Pb-210 are naturally occurring.

Number of Non-Routine Reported Measurements = 0

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY
 Name of Facility St. Lucie Units 1 & 2, Docket No(s). 50-335 & 50-389
 Location of Facility St. Lucie, Florida, Reporting Period January 1 - December 31, 2013
 (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) ^b Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c	Mean (f) ^b	
			Distance & Direction	Range	
Tritium, 65	172	108 (4/53) 92 - 126	H-15 <1 mi., ENE/E/ESE	108 (4/53) 92 - 126	<MDA (12/12)
Gamma Isotopic, 65					
⁴⁰ K	58	339 (53/53) 268 - 391	H-15 <1 mi., ENE/E/ESE	339 (53/53) 268 - 391	351 (12/12) 278 - 407
⁵⁴ Mn	3	<MDA	---	---	<MDA
⁵⁹ Fe	6	<MDA	---	---	<MDA
⁵⁸ Co	3	<MDA	---	---	<MDA
⁶⁰ Co	4	<MDA	---	---	<MDA
⁶⁵ Zn	7	<MDA	---	---	<MDA
⁹⁵ Zr-Nb	6-3	<MDA	---	---	<MDA
¹³¹ I	4	<MDA	---	---	<MDA
¹³⁴ Cs	4	<MDA	---	---	<MDA
¹³⁷ Cs	4	<MDA	---	---	<MDA
¹⁴⁰ Ba-La	9-3	<MDA	---	---	<MDA

K-40 is naturally occurring.

Number of Non-Routine Reported Measurements = 0

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 Location of Facility St. Lucie, Florida, Reporting Period January 1 - December 31, 2013
 (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) ^b Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c Distance & Direction	Mean (f) ^b Range	
Gamma Isotopic, 4					
⁷ Be	56	40 (1/2)	---	---	<MDA (1/2)
⁴⁰ K	100	315 (2/2) 282 - 347	H-15 <1 mi., ENE/E/ESE	315 (2/2) 282 - 347	237 (1/2) 183- 291
⁵⁸ Co	6	<MDA	---	---	<MDA
⁶⁰ Co	7	<MDA	---	---	<MDA
¹³⁴ Cs	7	<MDA	---	---	<MDA
¹³⁷ Cs	7	<MDA	---	---	<MDA
²¹⁰ Pb	---	<MDA	---	---	233 (1/2)
²²⁶ Ra	15	874 (2/2) 753 - 994	H-15 <1 mi., ENE/E/ESE	874 (2/2) 753 - 994	542 (1/2) 522 - 562
²³² Th	25	201 (2/2) 130 - 272	H-15 <1 mi., ENE/E/ESE	201 (2/2) 130 - 272	67 (1/2)
²³⁵ U	---	47 (1/2)	H-15 <1 mi., ENE/E/ESE	47 (1/2)	33 (1/2)
²³⁸ U	---	395 (1/2)	H-15 <1 mi., ENE/E/ESE	395 (1/2)	366 (2/2) 121 - 611

Be-7, K-40, Pb-210, Ra-226, Th-232, U-235 & U-238 are naturally occurring.

Number of Non-Routine Reported Measurements = 0

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY
 Name of Facility St. Lucie Units 1 & 2, Docket No(s). 50-335 & 50-389
 Location of Facility St. Lucie, Florida, Reporting Period January 1 - December 31, 2013
 (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) ^b Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c	Mean (f) ^b	
			Distance & Direction	Range	
Gamma Isotopic, 5					
⁴⁰ K	270	2456 (3/3) 2198 – 2736	H-15 <1 mi., ENE/E/ESE	2456 (3/3) 2198 – 2736	1752 (2/2) 1695-1808
⁵⁴ Mn	16	<MDA	---	---	<MDA
⁵⁹ Fe	28	<MDA	---	---	<MDA
⁵⁸ Co	15	<MDA	---	---	<MDA
⁶⁰ Co	16	<MDA	---	---	<MDA
⁶⁵ Zn	32	<MDA	---	---	<MDA
¹³⁴ Cs	16	<MDA	---	---	<MDA
¹³⁷ Cs	18	<MDA	---	---	<MDA
²²⁶ Ra	300	<MDA	---	---	627 (1/2)
²²⁸ Ra	58	< MDA	---	---	< MDA

K-40, Ra-226 & Ra-228 are naturally occurring.

Number of Non-Routine Reported Measurements = 0

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 Location of Facility St. Lucie, Florida, Reporting Period January 1 - December 31, 2013
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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) ^b Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c	Mean (f) ^b	
			Distance & Direction	Range	
Gamma Isotopic, 4					
⁴⁰ K	270	2598 (2/2) 2297 - 2898	H-15 <1 mi., ENE/E/ESE	2598 (2/2) 2297 - 2898	2058 (2/2) 1849 - 2266
⁵⁴ Mn	16	<MDA	---	---	<MDA
⁵⁹ Fe	28	<MDA	---	---	<MDA
⁵⁸ Co	15	<MDA	---	---	<MDA
⁶⁰ Co	16	<MDA	---	---	<MDA
⁶⁵ Zn	32	<MDA	---	---	<MDA
¹³⁴ Cs	16	<MDA	---	---	<MDA
¹³⁷ Cs	18	<MDA	---	---	<MDA

K-40 is naturally occurring.

Number of Non-Routine Reported Measurements = 0

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 Location of Facility St. Lucie, Florida, Reporting Period January 1 - December 31, 2013
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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) ^b Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c	Mean (f) ^b	
			Distance & Direction	Range	
Gamma Isotopic, 36					
⁷ Be	64	1153 (24/24) 669 - 1849	H-51 1 mi., N/NNW	1221 (12/12) 746 - 1849	932 (12/12) 746 - 1532
⁴⁰ K	120	4288(24/24) 2865 - 6091	H-52 1 mi., S/SSE	4541 (12/12) 2865 - 6091	3423 (12/12) 2679 - 4153
⁵⁸ Co	6	<MDA	---	---	<MDA
⁶⁰ Co	8	<MDA	---	---	<MDA
¹³¹ I	8	<MDA	---	---	<MDA
¹³⁴ Cs	8	<MDA	---	---	<MDA
¹³⁷ Cs	8	<MDA	---	---	<MDA
²¹⁰ Pb	---	481 (6/24) 264 - 1154	H-51 1 mi., N/NNW	608 (3/12) 264 - 1154	176 (1/12)
²¹² Pb	---	17 (2/24) 11 - 22	H-51 1 mi., N/NNW	17 (2/24) 11 - 22	16 (1/12)
²²⁶ Ra	189	<MDA			231 (1/12)

Be-7, K-40, Pb-210, Pb-212, & Ra-226 are naturally occurring.

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

DEVIATIONS / MISSING DATA

There were several instances of missing data and air sampler partial run times as follows:

- A) Pathway: Airborne, Particulates and Radioiodines
- Location: H-14, 1 mile SE
- Dates: 3/13/13 – 3/20/13
- Deviation: Failure to Perform Continuous Monitoring
- Description of Problem: Air sampling pump coupling on the vacuum tubing came loose and was disconnected soon after the previous week's collection; pump had total run time for the week but the particulate filter had only a small amount of particulate deposition; estimate just a small amount of total sampling volume. The airborne sample was not representative and was documented as missing data.
- Corrective Action: Tightened coupling; verified equipment as operable.
-
- B) Pathway: Airborne, Particulates and Radioiodines
- Location: H-12, 12 miles S
- Dates: 6/19/13 – 6/26/13
- Deviation: Failure to Perform Continuous Monitoring
- Description of Problem: Air sampling pump did not have power and was not operational; the inline switch to the pump was turned off; estimated sampling duration of 169.5 hours of 192.3 hour sampling period.
- Corrective Action: There was an unknown reason why the pump switch was in the off position; turned pump on and restored power; verified equipment as operable.

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- C) Pathway: Airborne, Particulates and Radioiodines
- Location: H-14, 1 mile SE
- Dates: 7/2/13 – 7/9/13
- Deviation: Failure to Perform Continuous Monitoring
- Description of Problem: Air sampling pump was not operational; estimated sampling duration of 97.2 hours of 144.3 hour sampling period.
- Corrective Action: Replaced pump; verified equipment as operable.
-
- D) Pathway: Airborne, Particulates and Radioiodines
- Location: H-30, 2 miles W
- Dates: 9/17/13 – 9/24/13
- Deviation: Failure to Perform Continuous Monitoring
- Description of Problem: Air sampling pump failure during sampling period; estimated sampling duration of 82.7 hours of 168.9 hour sampling period.
- Corrective Action: Replaced pump; gas meter changed out due to three consecutive weeks of out of range flow rates; verified equipment as operable.
-
- E) Pathway: Airborne, Particulates and Radioiodines
- Location: H-34, 0.5 miles N
- Dates: 9/17/13 – 9/24/13
- Deviation: Failure to Perform Continuous Monitoring
- Description of Problem: Air sampling pump did not have power and was not operational; estimated sampling duration of 50.7 hours of 169.9 hour sampling period.
- Corrective Action: Restored power to pump; verified equipment as operable.

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- F) Pathway: Airborne, Particulates and Radioiodines
- Location: H-14, 1 miles SE
- Dates: 11/4/13 – 11/11/13
- Deviation: Failure to Perform Continuous Monitoring
- Description of Problem: Air sampling pump failure during sampling period; average of total flows was within established REMP sampling program limits; estimated sampling duration of 164.8 hours of 167.7 hour sampling period.
- Corrective Action: Replaced pump; verified equipment as operable.

The above REMP air sampler location partial run time and missing data are documented in the St. Lucie Site Corrective Action Program.

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TABLE 1B

ANALYSIS WITH LLDs ABOVE THE REQUIRED DETECTION CAPABILITIES
(LLDs) Listed in ODCM TABLE 4.12-1
1/1/2013 – 12/31/2013

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

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TABLE 2

LAND USE CENSUS
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Survey Performed June through August 2013

Distance to Nearest (a, b)

Sector	Milk (c) Animal	Residence	Garden (d)
N	O (e)	O	O
NNE	O	O	O
NE	O	O	O
ENE	O	O	O
E	O	O	O
ESE	O	O	O
SE	O	1.5/142 1.6/145	O
SSE	L (f)	1.8/147 (g) 2.0/149	L
S	L	3.3/190	L
SSW	L	2.2/212	4.4/207
SW	L	1.9/234	L
WSW	L	1.9/240	2.0/250
W	L	1.9/260	L
WNW	L	2.3/281	4.0/282 4.2/284
NW	L	3.4/304	L
NNW	L	2.7/344	L

TABLE 2

LAND USE CENSUS
(Page 2 of 2)

NOTES

a. All categories surveyed out to a 5-mile radius from the St. Lucie Plant.

b. The following format is used to denote the location:

distance (miles) / bearing (degrees)

For example, a residence located in the southeast sector at a distance of 1.5 miles bearing 142 degrees is recorded as 1.5/142.

c. Potential milk animal locations.

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

e. O denotes that the sector area is predominantly an ocean area.

f. L denotes that the sector area is predominantly a land area unoccupied by the category type.

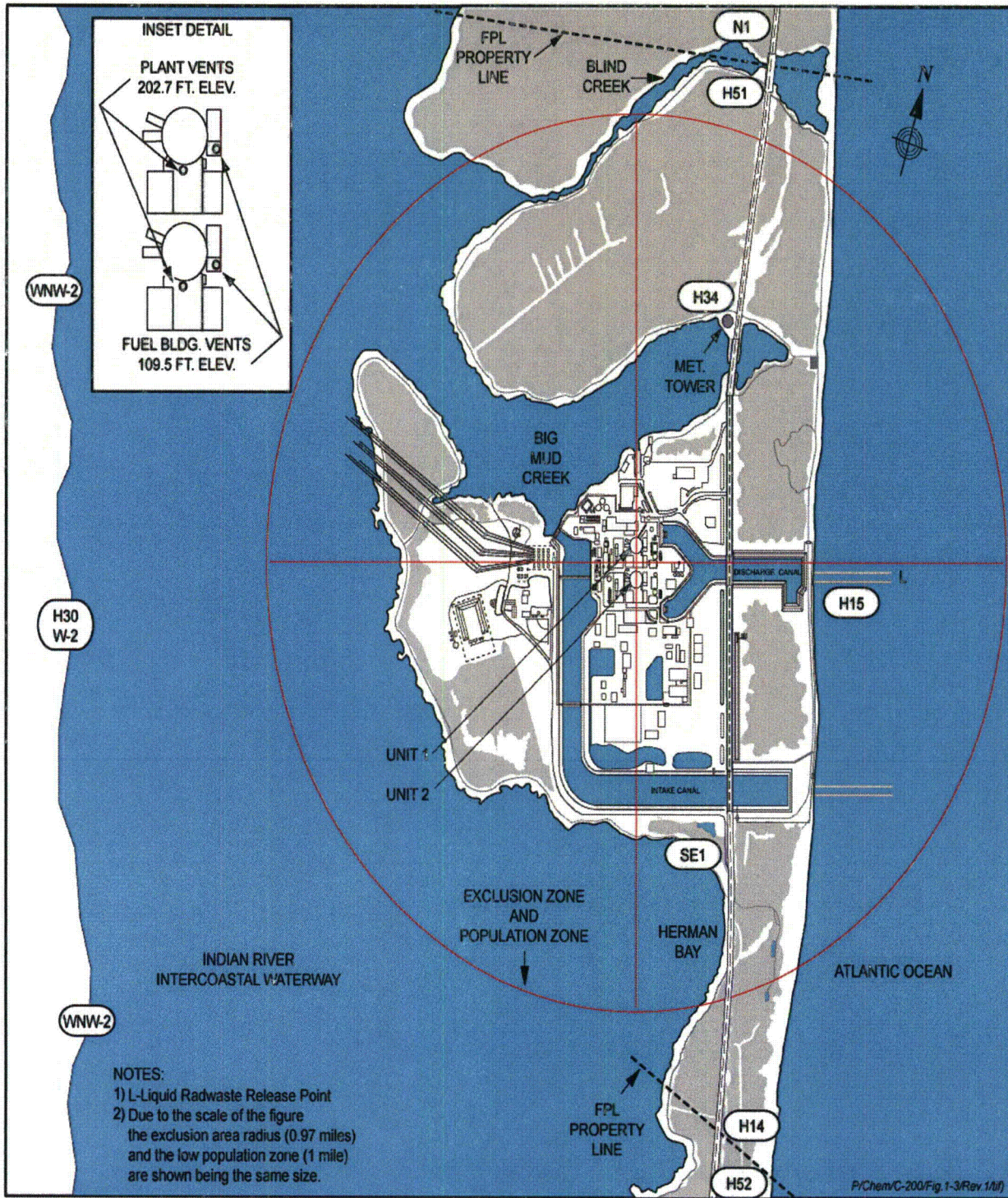
g. Non-residential occupied buildings in these sectors include the following:

<u>Sector</u>	<u>Distance</u>	<u>Description</u>
SSE	1.8/147	Fire Station

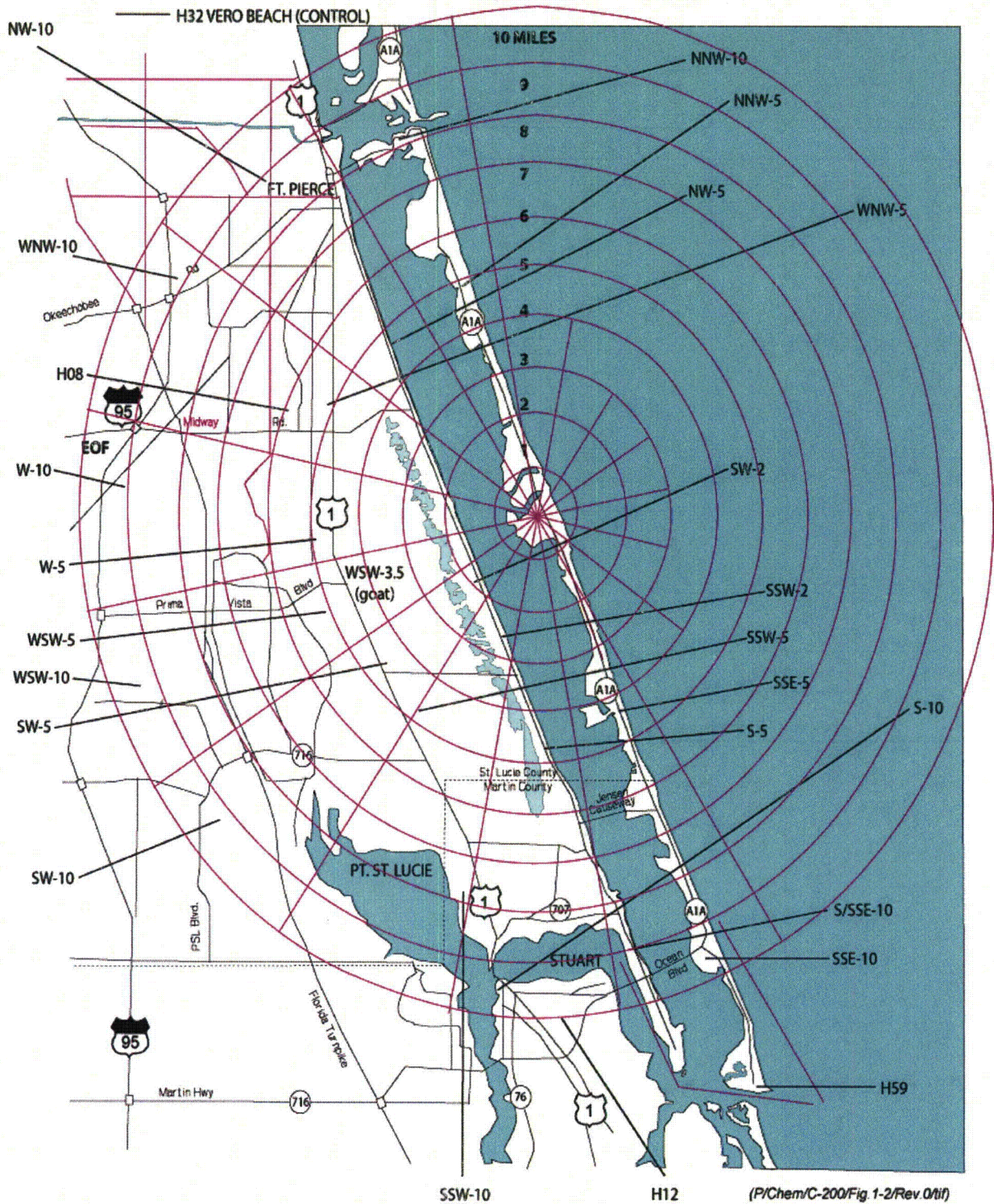
ATTACHMENT A

KEY TO SAMPLE LOCATIONS

SITE AREA MAP & ENVIRONMENTAL SAMPLE LOCATIONS



ENVIRONMENTAL SAMPLE LOCATIONS (10 MILES)



ATTACHMENT A
PAGE 1 OF 3

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

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
N-1	N	1	A1A, North of Blind Creek
NNW-5	NNW	4.8	Frederick Douglas Beach Entrance
NNW-10	NNW	8.7	Coast Guard Station
NW-5	NW	5.4	Indian River Dr. at Rio Vista Dr.
NW-10	NW	9.6	FPL Facility, S.R. 68 at 33 RD St.
WNW-2	WNW	2.3	Cemetery South of 7107 Indian River Dr.
WNW-5	WNW	5.1	U.S. 1 at S.R. 712
WNW-10	WNW	10	S.R. 70, West of Interstate 95
W-2	W	2	Power Line - 77609 Indian River Drive
W-5	W	5.4	Oleander and Sager Street
W-10	W	10.3	Interstate 95 and S.R. 709
WSW-2	WSW	1.8	8503 Indian River Dr.
WSW-5	WSW	5.6	Prima Vista Blvd. at Yacht Club
WSW-10	WSW	10	Del Rio and Davis Street
SW-2	SW	2	9205 Indian River Drive
SW-5	SW	4.5	FPL Walton Service Center
SW-10	SW	10.2	Port St. Lucie Blvd. and Cairo Rd.
SSW-2	SSW	2.6	10307 Indian River Drive
SSW-5	SSW	6	U.S. 1 and Port St. Lucie Blvd.
SSW-10	SSW	8	Pine Valley and Westmoreland Rd.
S-5	S	5.2	13189 Indian River Drive
S-10	S	10.8	U.S. 1 and Palm City Ave
S/SSE-10	SSE	9.9	Indian River Dr. and Quail Run Lane
SSE-5	SSE	5.1	North of Entrance to Miramar
SSE-10	SSE	10.2	Elliot Museum
SE-1	SE	1	South of Cooling Canal
<u>Control:</u>			
H-32	NNW	18.1	University of Florida IFAS Vero Beach

ATTACHMENT A
PAGE 2 OF 3

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>
H-08	WNW	6	FPL Substation, Weatherbee Rd.
H-14	SE	1	On-Site, near south property line
H-30	W	2	Power Line, 7609 Indian River Drive
H-34	N	0.5	On-Site at Meteorology Tower

Control:

H-12	S	12	FPL Substation, SR-76 Stuart
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PATHWAY: WATERBORNE
SAMPLES COLLECTED: SURFACE WATER (OCEAN)
SAMPLE COLLECTION FREQUENCY: H-15 WEEKLY, H-59 MONTHLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
H-15	ENE/E/SSE	<1	Atlantic Ocean, public beaches east side A1A

Control:

H-59	S/SSE	10-20	Near south end of Hutchinson Island
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ATTACHMENT A
PAGE 3 OF 3

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>
H-15	ENE/E/ESE	<1	Atlantic Ocean, public beaches east side A1A

Control:

H-59	S/SSE	10-20	Near south end of Hutchinson Island
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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>
H-15	ENE/E/ESE	<1	Ocean Side, Vicinity of St. Lucie Plant

Control:

H-59	S/SSE	10-20	Near south end of Hutchinson Island
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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>
H-51	N/NNW	1	Off-Site Near North Property Line
H-52	S/SSE	1	Off-Site Near South Property Line

Control:

H-59	S/SSE	10-20	Near south end of Hutchinson Island
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ATTACHMENT B

RADIOLOGICAL SURVEILLANCE OF
FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE SITE

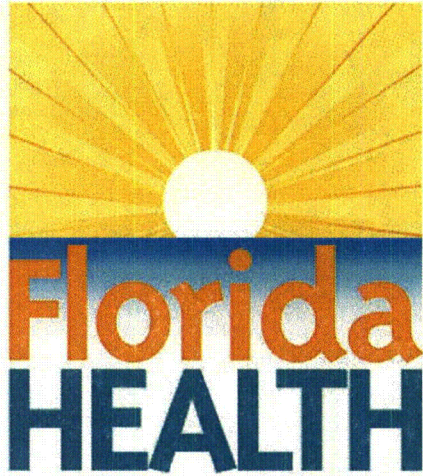
2013

First Quarter 2013

Second Quarter 2013

Third Quarter 2013

Fourth Quarter 2013



RADIOLOGICAL SURVEILLANCE
OF
FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

FIRST QUARTER 2013

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

First Quarter, 2013

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Number of Sample Locations</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	27	27
2. Airborne			
2.a. Air Iodines	Weekly	5	64
2.b. Air Particulates	Weekly	5	64
3. Waterborne			
3.a. Surface Water	Weekly	1	13
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	2	2
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	2	1
4.a.2. Fish	Semiannually	2	1
4.b. Broadleaf Vegetation	Monthly	3	<u>9</u>
			Total: 184

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 - TLD's - (μ R/hour)

Sample Site	Deployment 05-Dec-12 Collection 13-Mar-13	Sample Site	Deployment 05-Dec-12 Collection 13-Mar-13
N-1	2.88 ± 0.17	SW-2	2.67 ± 0.21
NNW-5	4.14 ± 0.59	SW-5	3.43 ± 0.29
NNW-10	3.59 ± 0.52	SW-10	3.05 ± 0.49
NW-5	3.30 ± 0.22	SSW-2	2.87 ± 0.58
NW-10	4.16 ± 0.28	SSW-5	3.40 ± 0.37
WNW-2	3.35 ± 0.14	SSW-10	3.25 ± 0.12
WNW-5	3.30 ± 0.21	S-5	3.46 ± 0.17
WNW-10	3.11 ± 0.17	S-10	2.87 ± 0.14
W-2	2.62 ± 0.36	S/SSE-10	2.74 ± 0.26
W-5	3.11 ± 0.23	SSE-5	2.63 ± 0.30
W-10	2.98 ± 0.54	SSE-10	2.90 ± 0.07
WSW-2	2.85 ± 0.24	SE-1	2.77 ± 0.14
WSW-5	2.99 ± 0.28	H-32	3.08 ± 0.21
WSW-10	2.71 ± 0.09		

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

<u>Collection Date</u>	<u>H08</u>	<u>H12</u>	<u>H14</u>	<u>H30</u>	<u>H34</u>
02-Jan-13	<0.02	<0.02	<0.02	<0.02	<0.02
09-Jan-13	<0.03	<0.03	<0.03	<0.03	<0.03
17-Jan-13	<0.02	<0.02	<0.02	<0.02	<0.02
22-Jan-13	<0.02	<0.02	<0.02	<0.02	<0.02
29-Jan-13	<0.03	<0.03	<0.03	<0.03	<0.03
05-Feb-13	<0.02	<0.02	<0.02	<0.02	<0.02
13-Feb-13	<0.02	<0.02	<0.02	<0.02	<0.02
20-Feb-13	<0.03	<0.03	<0.03	<0.03	<0.03
27-Feb-13	<0.03	<0.03	<0.03	<0.03	<0.03
07-Mar-13	<0.03	<0.03	<0.03	<0.03	<0.03
13-Mar-13	<0.04	<0.04	<0.03	<0.03	<0.03
20-Mar-13	<0.03	<0.03	(A)	<0.03	<0.03
26-Mar-13	<0.03	<0.03	<0.03	<0.03	<0.03

(A) Vacuum tube separated; no deposition on filter; no sample collected.

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

<u>Collection Date</u>	<u>H08</u>	<u>H12</u>	<u>H14</u>	<u>H30</u>	<u>H34</u>
02-Jan-13	0.028 ± 0.003	0.022 ± 0.002	0.021 ± 0.002	0.020 ± 0.002	0.020 ± 0.002
09-Jan-13	0.009 ± 0.002	0.011 ± 0.002	0.012 ± 0.002	0.014 ± 0.002	0.011 ± 0.002
17-Jan-13	0.005 ± 0.001	0.011 ± 0.002	0.010 ± 0.002	0.007 ± 0.002	0.007 ± 0.002
22-Jan-13	0.009 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.016 ± 0.003
29-Jan-13	0.028 ± 0.003	0.039 ± 0.003	0.051 ± 0.004	0.032 ± 0.003	0.033 ± 0.003
05-Feb-13	0.016 ± 0.002	0.019 ± 0.002	0.021 ± 0.002	0.019 ± 0.002	0.021 ± 0.002
13-Feb-13	0.020 ± 0.002	0.019 ± 0.002	0.017 ± 0.002	0.017 ± 0.002	0.018 ± 0.002
20-Feb-13	0.021 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.015 ± 0.002
27-Feb-13	0.022 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.013 ± 0.002	0.013 ± 0.002
07-Mar-13	0.023 ± 0.002	0.021 ± 0.002	0.020 ± 0.002	0.021 ± 0.002	0.019 ± 0.002
13-Mar-13	0.013 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.010 ± 0.002
20-Mar-13	0.018 ± 0.002	0.026 ± 0.003	(A)	0.022 ± 0.002	0.019 ± 0.002
26-Mar-13	0.015 ± 0.002	0.017 ± 0.003	0.020 ± 0.003	0.015 ± 0.002	0.022 ± 0.003
Average:	0.017 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.017 ± 0.001

(A) Vacuum tube separated; no deposition on filter; no sample collected.

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

<u>Sample Site</u>	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
H08	0.1224 ± 0.0092	<0.0119	<0.0012	<0.0015	<0.0114
H12	0.1319 ± 0.0197	<0.0134	<0.0011	<0.0011	0.0162 ± 0.0073
H14	0.0927 ± 0.0022	<0.0059	<0.0004	<0.0004	0.0145 ± 0.0015
H30	0.1172 ± 0.0093	<0.0203	<0.0013	<0.0015	<0.0113
H34	0.1610 ± 0.0199	<0.0225	<0.0013	<0.0015	0.0135 ± 0.0056

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)
H15	02-Jan-13	<142	325 ± 33	<4	<4	<8	<7	<8	<8	<9	<5	<5	<7
	09-Jan-13	<169	273 ± 19	<2	<2	<4	<2	<4	<3	<3	<2	<2	<3
	17-Jan-13	118 ± 45	356 ± 35	<4	<4	<9	<7	<8	<7	<9	<5	<5	<6
	22-Jan-13	<169	279 ± 54	<2	<2	<5	<3	<5	<4	<3	<2	<3	<4
	29-Jan-13	<142	385 ± 32	<4	<4	<6	<6	<8	<6	<5	<5	<4	<8
	05-Feb-13	<142	313 ± 27	<1	<2	<4	<2	<3	<3	<3	<1	<2	<2
	13-Feb-13	<142	270 ± 62	<2	<3	<6	<3	<6	<4	<3	<2	<3	<9
	20-Feb-13	<140	324 ± 17	<3	<2	<6	<3	<6	<4	<3	<3	<3	<8
	27-Feb-13	<168	361 ± 35	<4	<3	<6	<5	<8	<7	<4	<5	<3	<8
	07-Mar-13	<168	317 ± 23	<3	<3	<6	<3	<6	<5	<3	<3	<3	<10
	13-Mar-13	<141	331 ± 22	<3	<3	<6	<3	<6	<5	<5	<3	<3	<5
	20-Mar-13	<141	342 ± 98	<3	<3	<6	<4	<7	<5	<6	<3	<3	<4
	26-Mar-13	97 ± 45	384 ± 26	<2	<2	<4	<2	<4	<3	<7	<2	<2	<4
H59	02-Jan-13	<142	278 ± 58	<2	<3	<6	<3	<4	<4	<5	<2	<2	<4
	05-Feb-13	<142	316 ± 23	<3	<3	<7	<5	<7	<6	<6	<3	<4	<5
	14-Mar-13	<141	343 ± 78	<3	<3	<7	<3	<7	<5	<5	<3	<3	<5

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

(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-235</u>	<u>U-238</u>
H15	13-Feb-13	<98	347 ± 90	<10	<9	<16	<13	<2621	994 ± 128	272 ± 21	<85	<644
H59	13-Feb-13	<71	291 ± 61	<7	<8	<10	<9	<1796	562 ± 87	<52	<57	611 ± 169

4.a.1. CRUSTACEA - Mixed 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>
H15	14-Mar-13	2736 ± 477	<93	<94	<229	<88	<241	<125	<96	<1788	<365
H59	This sample to be collected.										

4.a.2. FISH - Crevalle Jacks - (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>
H15	14-Mar-13	2898 ± 547	<26	<27	<71	<38	<65	<25	<34	<466	<132
H59	This sample to be 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>	<u>Ra-228</u>
H51	02-Jan-13	1564 ± 88	3097 ± 133	<18	<12	<13	<984	<251	<45
	05-Feb-13	1849 ± 111	4352 ± 207	<26	<14	<15	<2941	<276	<65
	14-Mar-13	967 ± 79	4631 ± 198	<17	<14	<14	<2661	<261	<55
H52	02-Jan-13	1155 ± 82	3425 ± 147	<25	<11	<12	<1145	<262	<41
	05-Feb-13	938 ± 73	2865 ± 157	<22	<13	<12	<2660	<278	<59
	14-Mar-13	1465 ± 106	6091 ± 242	<21	<18	<15	<3552	<333	<79
H59	02-Jan-13	1532 ± 73	3142 ± 128	<18	<10	<10	<897	<218	<36
	05-Feb-13	1140 ± 83	2679 ± 171	<26	<15	<12	<2715	231 ± 110	<65
	14-Mar-13	722 ± 48	4153 ± 215	<17	<12	<15	<1172	<294	<52

**2013
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
ST. LUCIE PLANT - UNITS 1 & 2**



**RADIOLOGICAL SURVEILLANCE
OF
FLORIDA POWER AND LIGHT COMPANY**

ST. LUCIE PLANT

SECOND QUARTER 2013

BUREAU OF RADIATION CONTROL

2013
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
ST. LUCIE PLANT - UNITS 1 & 2

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

Second Quarter, 2013

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	27	27
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Weekly	1	13
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	2	0
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	2	2
4.a.2. Fish	Semiannually	2	1
4.b. Broadleaf Vegetation	Monthly	3	9
			Total: 185

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 - TLD's - (μ R/hour)

Sample Site	Deployment 13-Mar-13 Collection 10-Jun-13	Sample Site	Deployment 13-Mar-13 Collection 10-Jun-13
N-1	3.06 \pm 0.18	SW-2	3.12 \pm 0.17
NNW-5	3.06 \pm 0.17	SW-5	3.55 \pm 0.10
NNW-10	3.77 \pm 0.44	SW-10	3.31 \pm 0.16
NW-5	2.98 \pm 0.03	SSW-2	3.07 \pm 0.14
NW-10	3.92 \pm 0.21	SSW-5	3.64 \pm 0.15
WNW-2	3.19 \pm 0.35	SSW-10	3.55 \pm 0.40
WNW-5	3.08 \pm 0.27	S-5	3.73 \pm 0.31
WNW-10	3.48 \pm 0.12	S-10	3.00 \pm 0.06
W-2	2.91 \pm 0.39	S/SSE-10	2.83 \pm 0.10
W-5	3.30 \pm 0.10	SSE-5	2.90 \pm 0.20
W-10	3.17 \pm 0.25	SSE-10	3.06 \pm 0.21
WSW-2	4.30 \pm 0.68	SE-1	2.95 \pm 0.16
WSW-5	2.89 \pm 0.31	H-32	3.45 \pm 0.16
WSW-10	2.75 \pm 0.08		

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

<u>Collection Date</u>	<u>H08</u>	<u>H12</u>	<u>H14</u>	<u>H30</u>	<u>H34</u>
03-Apr-13	<0.03	<0.03	<0.03	<0.03	<0.03
11-Apr-13	<0.02	<0.02	<0.02	<0.02	<0.02
18-Apr-13	<0.03	<0.03	<0.03	<0.03	<0.03
25-Apr-13	<0.02	<0.02	<0.02	<0.02	<0.02
30-Apr-13	<0.03	<0.03	<0.03	<0.03	<0.03
07-May-13	<0.03	<0.03	<0.03	<0.03	<0.03
13-May-13	<0.04	<0.04	<0.04	<0.04	<0.04
22-May-13	<0.02	<0.02	<0.02	<0.02	<0.02
29-May-13	<0.02	<0.02	<0.02	<0.02	<0.02
05-Jun-13	<0.03	<0.03	<0.03	<0.03	<0.03
11-Jun-13	<0.03	<0.03	<0.03	<0.03	<0.03
18-Jun-13	<0.02	<0.02	<0.02	<0.02	<0.02
26-Jun-13	<0.02	<0.02	<0.02	<0.02	<0.02

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

<u>Collection Date</u>	<u>H08</u>	<u>H12</u>	<u>H14</u>	<u>H30</u>	<u>H34</u>
03-Apr-13	0.015 ± 0.002	0.016 ± 0.002	0.011 ± 0.002	0.007 ± 0.001	0.006 ± 0.001
11-Apr-13	0.017 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.011 ± 0.002
18-Apr-13	0.009 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.013 ± 0.002
25-Apr-13	0.007 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.005 ± 0.002	0.013 ± 0.002
30-Apr-13	0.011 ± 0.003	0.011 ± 0.003	0.019 ± 0.003	0.009 ± 0.002	0.010 ± 0.003
07-May-13	0.014 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.012 ± 0.002	0.010 ± 0.002
13-May-13	0.015 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.010 ± 0.002	0.014 ± 0.002
22-May-13	0.015 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.013 ± 0.002	0.015 ± 0.002
29-May-13	0.012 ± 0.002	0.010 ± 0.002	0.014 ± 0.002	0.008 ± 0.002	0.015 ± 0.002
05-Jun-13	0.014 ± 0.002	0.017 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.013 ± 0.002
11-Jun-13	0.005 ± 0.002	0.008 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.012 ± 0.002
18-Jun-13	0.013 ± 0.002	0.011 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.013 ± 0.002
26-Jun-13	0.010 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.011 ± 0.002	0.014 ± 0.002
Average:	0.012 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.009 ± 0.001	0.012 ± 0.001

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

<u>Sample Site</u>	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
H08	0.1046 ± 0.0208	<0.0126	<0.0011	<0.0008	0.0122 ± 0.0022
H12	0.1082 ± 0.0213	<0.0136	<0.0010	<0.0007	<0.0106
H14	0.1155 ± 0.0215	<0.0138	<0.0011	<0.0009	<0.0102
H30	0.0874 ± 0.0071	<0.0145	<0.0012	<0.0011	<0.0100
H34	0.1144 ± 0.0041	<0.0149	<0.0010	<0.0010	0.0120 ± 0.0042

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)
H15	03-Apr-13	<141	327 ± 79	<3	<3	<6	<3	<7	<5	<3	<3	<3	<10
	11-Apr-13	<138	381 ± 20	<2	<2	<5	<3	<4	<4	<3	<2	<2	<3
	18-Apr-13	<141	388 ± 24	<1	<1	<3	<1	<3	<2	<2	<1	<1	<3
	25-Apr-13	<140	367 ± 75	<5	<6	<11	<8	<11	<9	<8	<5	<6	<7
	30-Apr-13	<141	373 ± 27	<3	<3	<7	<5	<7	<6	<4	<3	<4	<11
	07-May-13	<139	368 ± 24	<3	<3	<6	<3	<7	<4	<3	<3	<3	<8
	13-May-13	<140	372 ± 24	<3	<3	<6	<3	<7	<5	<3	<3	<3	<8
	22-May-13	<140	391 ± 33	<4	<4	<9	<7	<9	<6	<5	<4	<5	<13
	29-May-13	<140	372 ± 25	<3	<3	<6	<5	<6	<5	<4	<3	<4	<6
	05-Jun-13	<138	338 ± 24	<3	<3	<6	<5	<6	<5	<4	<3	<4	<8
	11-Jun-13	<138	323 ± 72	<3	<3	<6	<3	<6	<5	<3	<3	<3	<8
	18-Jun-13	<138	354 ± 16	<2	<2	<4	<2	<4	<3	<3	<2	<2	<3
26-Jun-13	<138	282 ± 21	<3	<3	<6	<3	<7	<5	<5	<3	<3	<4	
H59	03-Apr-13	<138	393 ± 20	<1	<1	<3	<1	<2	<2	<3	<1	<1	<2
	13-May-13	<140	403 ± 32	<3	<3	<8	<4	<7	<6	<4	<5	<4	<12
	11-Jun-13	<138	368 ± 36	<4	<4	<10	<6	<8	<7	<5	<4	<5	<12

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

(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.

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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>
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These samples were previously collected.

4.a.1. CRUSTACEA - Mixed - (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>
H15	11-Apr-13	2434 ± 209	<17	<17	<35	<19	<35	<20	<18	<321	<83
H59	17-Apr-13	1808 ± 416	<18	<18	<49	<16	<43	<24	<20	<439	<94

4.a.2. FISH - Mixed - (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>
H15	This sample was previously collected.										
H59	10-Jun-13	1849 ± 478	<18	<17	<37	<20	<47	<20	<23	<387	<96

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>Pb-212</u>	<u>Ra-226</u>	<u>Ra-228</u>
H51	03-Apr-13	1309 ± 69	5182 ± 241	<24	<14	<16	1154 ± 92	<29	<315	<65
	13-May-13	1441 ± 100	3603 ± 239	<12	<17	<15	<3392	<91	<291	<76
	11-Jun-13	921 ± 51	4375 ± 256	<14	<11	<11	<1126	<23	<290	<50
H52	03-Apr-13	764 ± 93	5909 ± 331	<25	<23	<17	<3511	<97	<343	<84
	13-May-13	669 ± 68	4594 ± 266	<15	<20	<13	<3010	<88	<313	<75
	11-Jun-13	1456 ± 52	5322 ± 269	<10	<7	<8	464 ± 190	<17	<182	<31
H59	03-Apr-13	621 ± 75	3711 ± 239	<23	<19	<15	<3180	<90	<295	<74
	13-May-13	1009 ± 41	3129 ± 223	<8	<7	<8	<245	16 ± 3	<168	<32
	11-Jun-13	1091 ± 126	4076 ± 303	<17	<12	<15	<1305	<25	<314	<52



RADIOLOGICAL SURVEILLANCE
OF
FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

THIRD QUARTER 2013

BUREAU OF RADIATION CONTROL

2013
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
ST. LUCIE PLANT - UNITS 1 & 2

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

Third Quarter, 2013

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	27	27
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Weekly	1	13
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	2	2
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	2	1
4.a.2. Fish	Semiannually	2	1
4.b. Broadleaf Vegetation	Monthly	3	9
			Total: 186

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 - TLD's - (μ R/hour)

Sample Site	Deployment 10-Jun-13 Collection 10-Sep-13	Sample Site	Deployment 10-Jun-13 Collection 10-Sep-13
N-1	3.08 \pm 0.75	SW-2	3.21 \pm 0.22
NNW-5	3.08 \pm 0.30	SW-5	3.79 \pm 0.29
NNW-10	3.65 \pm 0.34	SW-10	3.18 \pm 0.39
NW-5	3.04 \pm 0.04	SSW-2	3.15 \pm 0.37
NW-10	3.87 \pm 0.28	SSW-5	3.85 \pm 0.08
WNW-2	3.08 \pm 0.09	SSW-10	3.57 \pm 0.29
WNW-5	3.17 \pm 0.26	S-5	3.76 \pm 0.19
WNW-10	3.26 \pm 0.25	S-10	3.16 \pm 0.33
W-2	2.86 \pm 0.10	S/SSE-10	3.23 \pm 0.10
W-5	3.25 \pm 0.17	SSE-5	2.90 \pm 0.28
W-10	3.28 \pm 0.21	SSE-10	3.18 \pm 0.07
WSW-2	3.41 \pm 0.10	SE-1	3.02 \pm 0.18
WSW-5	3.13 \pm 0.32	H-32	3.72 \pm 0.34
WSW-10	2.84 \pm 0.04		

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

<u>Collection Date</u>	<u>H08</u>	<u>H12</u>	<u>H14</u>	<u>H30</u>	<u>H34</u>
03-Jul-13	<0.02	<0.02	<0.02	<0.02	<0.02
09-Jul-13	<0.03	<0.03	<0.01(A)	<0.03	<0.03
16-Jul-13	<0.03	<0.03	<0.03	<0.03	<0.03
23-Jul-13	<0.03	<0.03	<0.03	<0.03	<0.03
29-Jul-13	<0.04	<0.03	<0.03	<0.04	<0.03
08-Aug-13	<0.01	<0.01	<0.01	<0.01	<0.01
14-Aug-13	<0.03	<0.03	<0.03	<0.03	<0.03
20-Aug-13	<0.03	<0.03	<0.03	<0.03	<0.03
27-Aug-13	<0.03	<0.03	<0.03	<0.03	<0.03
04-Sep-13	<0.03	<0.03	<0.03	<0.03	<0.03
10-Sep-13	<0.03	<0.03	<0.03	<0.03	<0.03
17-Sep-13	<0.03	<0.03	<0.03	<0.03	<0.03
24-Sep-13	<0.02	<0.02	<0.02	<0.02(B)	<0.03(C)

(A) Pump failed and was replaced. Estimated run time 97.2 out of 144.3 hours.

(B) Pump failed and was replaced. Estimated run time 82.7 out of 168.9 hours.

(C) No power to sample location. Estimated run time 50.7 out of 169.9 hours.

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

<u>Collection Date</u>	<u>H08</u>	<u>H12</u>	<u>H14</u>	<u>H30</u>	<u>H34</u>
03-Jul-13	0.012 ± 0.002	0.009 ± 0.002	0.012 ± 0.002	0.009 ± 0.002	0.008 ± 0.002
09-Jul-13	0.010 ± 0.002	0.013 ± 0.002	0.007 ± 0.003(A)	0.008 ± 0.002	0.010 ± 0.002
16-Jul-13	0.006 ± 0.002	0.006 ± 0.002	0.007 ± 0.002	0.007 ± 0.002	0.011 ± 0.002
23-Jul-13	0.008 ± 0.002	0.010 ± 0.002	0.016 ± 0.002	0.008 ± 0.002	0.013 ± 0.002
29-Jul-13	0.023 ± 0.003	0.021 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.018 ± 0.002
08-Aug-13	0.008 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.009 ± 0.001	0.012 ± 0.001
14-Aug-13	0.013 ± 0.002	0.015 ± 0.002	0.018 ± 0.003	0.012 ± 0.002	0.014 ± 0.002
20-Aug-13	0.014 ± 0.002	0.012 ± 0.002	0.015 ± 0.002	0.007 ± 0.002	0.012 ± 0.002
27-Aug-13	0.004 ± 0.001	0.007 ± 0.002	0.011 ± 0.002	0.007 ± 0.002	0.009 ± 0.002
04-Sep-13	0.010 ± 0.002	0.010 ± 0.002	0.012 ± 0.002	0.007 ± 0.002	0.009 ± 0.002
10-Sep-13	0.013 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.010 ± 0.002	0.013 ± 0.002
17-Sep-13	0.009 ± 0.002	0.010 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.010 ± 0.002
24-Sep-13	0.010 ± 0.002	0.011 ± 0.002	0.014 ± 0.002	0.011 ± 0.003(B)	0.019 ± 0.005(C)
Average:	0.011 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.009 ± 0.001	0.012 ± 0.001

(A) Pump failed and was replaced. Estimated run time 97.2 out of 144.3 hours.

(B) Pump failed and was replaced. Estimated run time 82.7 out of 168.9 hours.

(C) No power to sample location. Estimated run time 50.7 out of 169.9 hours.

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

<u>Sample Site</u>	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
H08	0.0813 ± 0.0065	<0.0145	<0.0011	<0.0011	<0.0099
H12	0.0923 ± 0.0082	<0.0255	<0.0012	<0.0013	0.0125 ± 0.0050
H14	0.0846 ± 0.0066	<0.0138	<0.0010	<0.0008	<0.0102
H30	0.0761 ± 0.0169	<0.0156	<0.0012	<0.0010	0.0065 ± 0.0015
H34	0.0760 ± 0.0204	<0.0158	<0.0013	<0.0008	0.0103 ± 0.0020

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

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H15	03-Jul-13	<136	380 ± 30	<4	<4	<9	<6	<9	<7	<8	<4	<4	<5
	09-Jul-13	<138	370 ± 21	<2	<2	<4	<4	<5	<4	<3	<2	<2	<6
	16-Jul-13	<138	276 ± 22	<3	<3	<5	<3	<7	<4	<3	<3	<3	<7
	23-Jul-13	<138	383 ± 28	<4	<4	<8	<6	<8	<6	<4	<4	<4	<13
	29-Jul-13	<149	351 ± 18	<2	<2	<4	<3	<4	<4	<3	<2	<2	<3
	08-Aug-13	<138	330 ± 23	<3	<3	<6	<3	<7	<5	<4	<3	<3	<4
	14-Aug-13	<135	364 ± 18	<2	<2	<4	<2	<4	<3	<2	<2	<2	<5
	20-Aug-13	92 ± 34	305 ± 23	<3	<3	<5	<3	<7	<5	<3	<3	<3	<6
	27-Aug-13	<149	329 ± 23	<3	<3	<6	<3	<6	<5	<3	<3	<3	<11
	04-Sep-13	<134	282 ± 23	<3	<2	<6	<3	<6	<5	<3	<3	<3	<8
	10-Sep-13	<134	347 ± 33	<5	<5	<11	<7	<11	<8	<5	<5	<6	<9
	17-Sep-13	<148	284 ± 23	<3	<2	<6	<3	<5	<4	<3	<3	<3	<7
	24-Sep-13	<148	312 ± 23	<3	<3	<5	<3	<7	<5	<3	<3	<3	<6
H59	16-Jul-13	<142	330 ± 33	<5	<5	<9	<8	<10	<9	<6	<5	<6	<11
	20-Aug-13	<135	407 ± 30	<4	<3	<8	<6	<9	<7	<4	<4	<4	<14
	11-Sep-13	<146	310 ± 23	<3	<3	<6	<3	<7	<5	<3	<3	<3	<9

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

(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-235</u>	<u>U-238</u>
H15	27-Aug-13	40 ± 14	282 ± 37	<9	<13	<9	<12	<843	753 ± 60	130 ± 11	47 ± 4	395 ± 45
H59	27-Aug-13	<58	183 ± 23	<6	<6	<6	<7	233 ± 44	522 ± 41	67 ± 7	33 ± 3	121 ± 23

4.a.1. CRUSTACEA - *Mixed 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>
H15*	27-Aug-13	2198 ± 329	<50	<61	<146	<53	<104	<50	<51	<755	<204
H59	This sample not yet collected.										

4.a.2. FISH - *Crevalle Jack - (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>
H15*	10-Sep-13	2297 ± 154	<18	<19	<37	<21	<41	<23	<20	<385	<73
H59	This sample not yet 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>Pb-212</u>	<u>Ra-226</u>	<u>Ra-228</u>
H51	16-Jul-13	1216 ± 57	3094 ± 155	<12	<11	<13	405 ± 149	<22	<264	<41
	20-Aug-13	746 ± 47	4663 ± 199	<13	<12	<14	<1170	22 ± 4	<274	<55
	11-Sep-13	1191 ± 46	4149 ± 163	<7	<7	<7	264 ± 41	<13	<155	<29
H52	16-Jul-13	820 ± 46	3627 ± 174	<12	<10	<11	<979	<21	<249	<52
	20-Aug-13	1079 ± 45	4607 ± 183	<9	<8	<8	286 ± 48	<15	<171	<33
	11-Sep-13	1174 ± 53	4684 ± 185	<13	<9	<13	<971	<21	<242	<45
H59	16-Jul-13	704 ± 32	2997 ± 114	<7	<7	<8	176 ± 36	<14	<154	<27
	20-Aug-13	895 ± 48	3795 ± 169	<12	<10	<13	<1111	<22	<291	<47
	11-Sep-13	747 ± 41	2944 ± 134	<10	<9	<11	<848	<18	<213	<40

**2013
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
ST. LUCIE PLANT - UNITS 1 & 2**



**RADIOLOGICAL SURVEILLANCE
OF
FLORIDA POWER AND LIGHT COMPANY**

ST. LUCIE SITE

FOURTH QUARTER 2013

BUREAU OF RADIATION CONTROL

Offsite Dose Calculation Manual Sampling

Fourth Quarter, 2013

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	27	27
2. Airborne			
2.a. Air Iodines	Weekly	5	70
2.b. Air Particulates	Weekly	5	70
3. Waterborne			
3.a. Surface Water	Weekly	1	14
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	2	0
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	2	1
4.a.2. Fish	Semiannually	2	1
4.b. Broadleaf Vegetation	Monthly	3	9
			Total: 195

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 - TLD's - (μ R/hour)

Sample Site	Deployment 10-Sep-13 Collection 09-Dec-13	Sample Site	Deployment 10-Sep-13 Collection 09-Dec-13
N-1	2.72 \pm 0.09	SW-2	2.69 \pm 0.17
NNW-5	2.66 \pm 0.19	SW-5	3.15 \pm 0.16
NNW-10	3.30 \pm 0.14	SW-10	2.77 \pm 0.17
NW-5	2.92 \pm 0.12	SSW-2	2.48 \pm 0.37
NW-10	3.94 \pm 0.43	SSW-5	3.13 \pm 0.12
WNW-2	2.94 \pm 0.08	SSW-10	2.92 \pm 0.05
WNW-5	2.72 \pm 0.24	S-5	3.45 \pm 0.20
WNW-10	3.12 \pm 0.05	S-10	2.67 \pm 0.08
W-2	2.52 \pm 0.09	S/SSE-10	2.44 \pm 0.14
W-5	2.98 \pm 0.38	SSE-5	2.52 \pm 0.12
W-10	2.57 \pm 0.06	SSE-10	2.69 \pm 0.15
WSW-2	2.78 \pm 0.22	SE-1	2.69 \pm 0.20
WSW-5	2.72 \pm 0.20	H-32	2.92 \pm 0.07
WSW-10	4.30 \pm 0.65		

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

<u>Collection Date</u>	<u>H08</u>	<u>H12</u>	<u>H14</u>	<u>H30</u>	<u>H34</u>
01-Oct-13	<0.03	<0.03	<0.03	<0.03	<0.03
08-Oct-13	<0.03	<0.03	<0.03	<0.03	<0.03
15-Oct-13	<0.03	<0.03	<0.03	<0.03	<0.03
22-Oct-13	<0.02	<0.02	<0.02	<0.02	<0.02
29-Oct-13	<0.03	<0.03	<0.03	<0.03	<0.03
05-Nov-13	<0.03	<0.03	<0.03	<0.03	<0.03
12-Nov-13	<0.03	<0.03	<0.03	<0.03	<0.03
20-Nov-13	<0.03	<0.03	<0.03	<0.03	<0.03
26-Nov-13	<0.02	<0.02	<0.02	<0.02	<0.02
03-Dec-13	<0.03	<0.03	<0.03	<0.03	<0.03
09-Dec-13	<0.03	<0.03	<0.03	<0.03	<0.03
16-Dec-13	<0.03	<0.03	<0.03	<0.03	<0.03
23-Dec-13	<0.03	<0.03	<0.03	<0.03	<0.03
30-Dec-13	<0.03	<0.03	<0.03	<0.03	<0.03

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

<u>Collection Date</u>	<u>H08</u>	<u>H12</u>	<u>H14</u>	<u>H30</u>	<u>H34</u>
01-Oct-13	0.012 ± 0.002	0.011 ± 0.002	0.012 ± 0.002	0.006 ± 0.002	0.010 ± 0.002
08-Oct-13	0.010 ± 0.002	0.011 ± 0.002	0.015 ± 0.002	0.008 ± 0.002	0.011 ± 0.002
15-Oct-13	0.007 ± 0.002	0.009 ± 0.002	0.012 ± 0.002	0.005 ± 0.002	0.013 ± 0.002
22-Oct-13	0.009 ± 0.002	0.013 ± 0.002	0.006 ± 0.002	0.011 ± 0.002	0.007 ± 0.002
29-Oct-13	0.023 ± 0.002	0.021 ± 0.002	0.022 ± 0.002	0.019 ± 0.002	0.024 ± 0.002
05-Nov-13	0.020 ± 0.002	0.016 ± 0.002	0.017 ± 0.002	0.015 ± 0.002	0.017 ± 0.002
12-Nov-13	0.012 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.010 ± 0.002
20-Nov-13	0.013 ± 0.002	0.014 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.012 ± 0.002
26-Nov-13	0.009 ± 0.002	0.010 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.009 ± 0.002
03-Dec-13	0.007 ± 0.002	0.009 ± 0.002	0.005 ± 0.002	0.005 ± 0.002	0.007 ± 0.002
09-Dec-13	0.010 ± 0.002	0.012 ± 0.002	0.005 ± 0.002	0.007 ± 0.002	0.010 ± 0.002
16-Dec-13	0.014 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.008 ± 0.002	0.014 ± 0.002
23-Dec-13	0.011 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.012 ± 0.002	0.009 ± 0.002
30-Dec-13	0.007 ± 0.002	0.010 ± 0.002	0.007 ± 0.002	0.005 ± 0.001	0.009 ± 0.002
Average:	0.012 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.010 ± 0.001	0.012 ± 0.001

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

<u>Sample Site</u>	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
H08	0.1186 ± 0.0076	<0.0154	<0.0010	<0.0009	0.0103 ± 0.0019
H12	0.1225 ± 0.0093	<0.0203	<0.0013	<0.0014	0.0119 ± 0.0040
H14	0.1275 ± 0.0178	<0.0116	<0.0011	<0.0009	<0.0097
H30	0.1091 ± 0.0158	<0.0222	<0.0013	<0.0013	<0.0091
H34	0.1118 ± 0.0182	<0.0159	<0.0010	<0.0009	<0.0107

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)				
H15	01-Oct-13	<144	301 ± 23	<3	<3	<7	<3	<6	<5	<3	<3	<3	<3	<9
	08-Oct-13	<143	364 ± 34	<5	<5	10	<7	<11	<8	<6	<4	<6	<6	<10
	15-Oct-13	<148	328 ± 23	<3	<3	<5	<3	<7	<5	<3	<3	<3	<3	<10
	22-Oct-13	<147	355 ± 24	<3	<3	<7	<3	<7	<5	<3	<3	<3	<3	<11
	29-Oct-13	<143	268 ± 25	<4	<3	<7	<6	<9	<6	<5	<4	<5	<5	<9
	05-Nov-13	<143	342 ± 22	<3	<3	<6	<4	<7	<5	<3	<3	<3	<3	<9
	12-Nov-13	<143	361 ± 28	<4	<3	<7	<5	<8	<7	<5	<4	<5	<5	<12
	20-Nov-13	<146	339 ± 24	<3	<3	<7	<3	<7	<4	<3	<3	<3	<3	<10
	26-Nov-13	<146	345 ± 24	<2	<3	<5	<3	<7	<5	<3	<3	<3	<3	<11
	03-Dec-13	126 ± 27	351 ± 24	<3	<3	<6	<3	<6	<5	<3	<3	<3	<3	<10
	10-Dec-13	<139	391 ± 31	<5	<4	<9	<7	<10	<8	<5	<4	<5	<5	<14
	16-Dec-13	<140	361 ± 27	<4	<4	<8	<6	<9	<7	<5	<4	<5	<5	<13
	23-Dec-13	<140	337 ± 24	<3	<3	<6	<3	<8	<4	<4	<3	<3	<3	<5
	30-Dec-13	<146	340 ± 24	<3	<3	<6	<3	<7	<5	<4	<3	<3	<3	<5
H59	01-Oct-13	<144	379 ± 22	<3	<3	<6	<4	<6	<5	<3	<3	<4	<4	<8
	05-Nov-13	<143	353 ± 33	<5	<4	<9	<7	<12	<9	<6	<5	<5	<5	<15
	10-Dec-13	<140	333 ± 25	<4	<3	<7	<6	<8	<7	<4	<4	<4	<4	<13

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

(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>
H15	This sample was previously collected.										
H59	This sample was previously collected.										

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>
H15	This sample was previously collected.										
H59	30-Oct-13	1695 ± 188	<30	<29	<65	<45	<72	<32	<33	627 ± 95	<165

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>
H15	This sample was previously collected.										
H59	10-Dec-13	2266 ± 148	<16	<16	<38	<18	<44	<20	<22	<360	<77

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>Pb-212</u>	<u>Ra-226</u>	<u>Ra-228</u>
H51	01-Oct-13	1082 ± 58	3364 ± 159	<22	<12	<14	<1122	<22	<287	<54
	05-Nov-13	767 ± 46	3685 ± 168	<15	<12	<12	<1088	<23	<307	<59
	10-Dec-13	1599 ± 72	4213 ± 190	<15	<12	<13	<1299	11 ± 4	<326	<54
H52	01-Oct-13	1501 ± 68	5870 ± 228	<22	<12	<14	<1111	<25	<295	<51
	05-Nov-13	681 ± 48	3442 ± 173	<16	<14	<15	<1117	<28	<309	<61
	10-Dec-13	1315 ± 50	4059 ± 163	<8	<8	<7	315 ± 47	<16	<175	<32
H59	01-Oct-13	1442 ± 68	4143 ± 184	<21	<11	<15	<1080	<25	<306	<55
	05-Nov-13	422 ± 35	2726 ± 141	<14	<10	<13	<1425	<26	<295	<47
	10-Dec-13	853 ± 40	3576 ± 149	<9	<8	<8	<262	<14	<181	<35

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ATTACHMENT C

**RESULTS FROM THE 2013
INTERLABORATORY COMPARISON PROGRAM
CONDUCTED BY
DEPARTMENT OF ENERGY**

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DOE-MAPEP 28 RESULTS

Radionuclide	Result	Ref. Value	Flag (Evaluation)	Acceptance Range
Matrix: RdF Air Filter Bq/filter				
MN54	4.8	4.26	A	2.98 – 5.54
CO57	2.2	2.36	A	1.65 – 3.07
CO60	0.02	0	A	False Positive Test (within acceptance range)
ZN65	3.6	3.13	A	2.19 – 4.07
CS134	1.7	1.78	A	1.25 – 2.31
CS137	2.8	2.60	A	1.82 – 3.38
Matrix: GrF Air Filter Bq/filter				
Gross Beta	1.53	0.85	N	0.43 – 1.28 See Note (2) Below
Matrix: MaS Soil Bq/kg				
K40	667	625.3	A	437.7 – 812.9
MN54	-0.7	0	A	False Positive Test (within acceptance range)
CO57	0.7	0	A	False Positive Test (within acceptance range)
CO60	695	691	A	484 - 898
ZN65	1077	995	A	697 - 1294
CS134	795	887	A	621 - 1153
CS137	603	587	A	411 - 763
Matrix: MaW Water Bq/L				
H3	489	507	A	355 – 659
MN54	29.8	27.4	A	19.2 – 35.6
CO57	32.1	30.9	A	21.6 – 40.2
CO60	20.7	19.56	A	16.69 – 25.43
NI63	NR	33.4	N	23.4 – 43.4 (not required)
ZN65	34.7	30.4	A	21.3 – 39.5
CS134	25.6	24.4	A	17.1 – 31.7
CS137	-0.06	0	A	False Positive Test (within acceptance range)
SR90	0.03	10.5	N	7.4 – 13.7 (not required)

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Matrix: RdV Vegetation, Bq/sample :

MN54	-0.01	0	A	False Positive Test (within acceptance range)
CO57	7.9	8.68	A	6.08 – 11.28
CO60	5.8	5.85	A	4.10 – 7.61
ZN65	6.3	6.25	A	4.38 – 8.13
CS134	0.01	0	A	False Positive Test (within acceptance range)
CS137	6.2	6.87	A	4.81 – 8.93

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

In MAPEP 28, the results for gamma on air filters, water, soil, and vegetation matrices for those nuclides associated with nuclear power plant operation and using analytical methods used in the REMP are acceptable.

There were two relevant data flags:

1) A false positive flag on Potassium-40 in water was reported. The MAPEP criteria for reporting require a value to be reported, regardless of significance. The value reported (0.7 Bq/L) was below any level of significance for reporting, is a value for a naturally occurring radioactive material, and thus is not a concern for environmental monitoring. A review of the data revealed no anomaly. No further actions will be taken as a result of this flag.

2) For the air filter matrix there was one not acceptable result for gross beta. The State result was 1.8 times the reference value. The reported value was 1.53 and the acceptance range was 0.43 to 1.28 Bq/sample. Calculations for the reported value were not verified by supervision prior to submittal to MAPEP. The same spreadsheet is used each time and it is believed old data was used for the calculation. After verification the reported value was corrected to 1.04 Bq/sample which was within tolerance. A procedure revision to state procedure, QP F, Data Verification, was completed to require verification of all data submitted to MAPEP.

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DOE-MAPEP 29 RESULTS

Radionuclide	Result	Ref. Value	Flag (Evaluation)	Acceptance Range
Matrix: RdF Air Filter Bq/filter				
MN54	3.7	3.5	A	2.5 – 4.6
CO57	3.1	3.4	A	2.4 – 4.4
CO60	2.2	2.3	A	1.6 – 3.0
ZN65	3.1	2.7	A	1.9 – 3.5
CS134	-0.1	0	A	False Positive Test (within acceptance range)
CS137	2.8	2.7	A	1.9 – 3.5
Matrix: GrF Air Filter Bq/filter				
Gross Beta	1.752	1.63	A	0.82 – 2.45
Matrix: MaS Soil Bq/kg				
K40	700	633	A	443 - 823
MN54	731	674	A	672 - 876
CO57	606	0	N	False Positive Test (See Note (2) Below)
CO60	492	451	A	316 - 586
ZN65	-0.5	0	A	False Positive Test (within acceptance range)
CS134	1266	1172	A	820 - 1524
CS137	1061	977	A	684 - 1270
Matrix: MaW Water Bq/L				
H3	6.8	0	N	False Positive Test (See Note (1) Below)
MN54	-0.1	0	A	False Positive Test (within acceptance range)
CO57	0.1	0	A	False Positive Test (within acceptance range)
CO60	24.6	23.58	A	16.51 – 30.65
ZN65	39.7	34.6	A	24.2 – 45.0
CS134	1266	1172	A	820 - 1524
CS137	1061	977	A	684 - 1270

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Matrix: RdV Vegetation, Bq/sample :

MN54	7.2	7.88	A	5.52 – 10.24
CO57	0.1	0	A	False Positive Test (within acceptance range)
CO60	0.1	0	A	False Positive Test (within acceptance range)
ZN65	2.5	2.63	A	1.84 – 3.42
CS134	5.0	5.20	A	3.64 – 6.76
CS137	6.0	6.60	A	4.62 – 8.58

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

In MAPEP 29, the results for gamma on air filters, gross beta, soil, and vegetation matrices for those nuclides associated with nuclear power plant operation and using analytical methods used in the REMP are acceptable.

There were two relevant data flags for MAPEP 29:

1) For the water matrix there was a false positive for tritium. The cause was determined to be less than adequate procedural guidance which did not "Require" but only stated a "Should" requirement that tritium sample vials be wiped down to remove static charge and prevent extra fluorescence of the sample cocktail and the resultant "false positive" result. After notification of the "false positive" result, the analyst reran the analysis after properly wiping down the sample vial and the result was acceptable. The State laboratory procedure was modified to require the use of anti-static wipes on all vials prior to placement in the liquid scintillation counter.

2) For the water matrix there was a false positive for Co-57. The cause was determined to be the presence of Eu-52 which is not in the MAPEP gamma spec library and gave a false positive for Co-57. The unknown was rerun using the nuclear power library and Co-57 was not identified. The state gamma analysis process has been revised to require the use of the nuclear power library when analyzing all MAPEP unknowns.

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ATTACHMENT D

Industry Initiative

Ground Water Protection Program

Tritium in Ground Water Monitoring

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A. Description of Program:

Quarterly sampling & analysis for Tritium & principle gamma emitters is performed by the State of Florida Department of Health (DOH) and Bureau of Radiation Control (BRC), pursuant to an Agreement between FPL and DOH, as part of the ODCM REMP sampling program.

The wells identified for radiological environmental sampling in support of the industry initiative are listed below, and in Appendix B-2 of the ODCM. The ten wells are on the 'outside' perimeter of the protected area. Two locations where the Plant ID ends with "S" are shallower wells adjacent, within a few feet, of a deeper well at the same location.

State ID	St. Lucie Plant ID	Location Description
H70	GIS-MW-ES	West of A1A; between the discharge canal and Gate "B"
H71	GIS-MW-EI	West of A1A; between the discharge canal and Gate "B"
H72	GIS-MW-SI	South of Intake canal and the adjacent access road
H73	GIS-MW-SWS	SW corner of Intake canal and the adjacent access road
H74	GIS-MW-SWI	SW corner of Intake canal and the adjacent access road
H75	GIS-MW-WI	West of plant site and intake canal; South of switchyard
H76	H76	North of Simulator; South of Big Mud Creek
H77	H77	East of Barge Slip; By LU bldg
H78	H78	South of North Warehouse
H79	H79	West of A1A and East of Parking Lot

B. St. Lucie 2013 Tritium Results ⁽¹⁾ Summary, pCi/L

Well number	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
H-70	<137	87	83	<147
H-71	336	399	393	335
H-72	<137	<138	<130	<147
H-73	<137	<138	<150	<147
H-74	<169	<138	105	<147
H-75	<137	<142	<150	<147
H76	175	<138	186	102
H77	106	<138	<130	<147
H78	<137	<140	105	<147
H79	<137	<138	143	<147

Notes

1. Samples analyzed for H3 and principle gamma emitters; tritium is the only fission product identified. Naturally occurring K-40 is occasionally identified.
2. Laboratory H3 MDA is about 140 pCi/liter

Map depicting the well locations follows.

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RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS
IN SUPPORT OF THE INDUSTRY INITIATIVE

