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APR 2 2 2019

L-2019-094
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 2018

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 2018.

Please contact me at (772) 467-7036 should there be any questions regarding this report.

Sincerely,

Michael J. Snyder
Licensing Manager
St. Lucie Plant

Enclosure: 2018 Annual Radiological Environmental Operating Report (93 pages)

MJS/rcs

cc: USNRC Senior Resident Inspector, St. Lucie Units 1 and 2

2018

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:

Prepared by: 4.11.19

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

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

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 (PSL) 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.

    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.

D. Land Use Census

A Land Use Census Survey 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 interlaboratory comparison program consists of participating in the DOE Mixed Analyte Performance Evaluation Program (MAPEP) and the Environmental Resources Associates (ERA) proficiency Testing, consisting of the MRaD and RadCheM study.

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 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 adverse 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.

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.

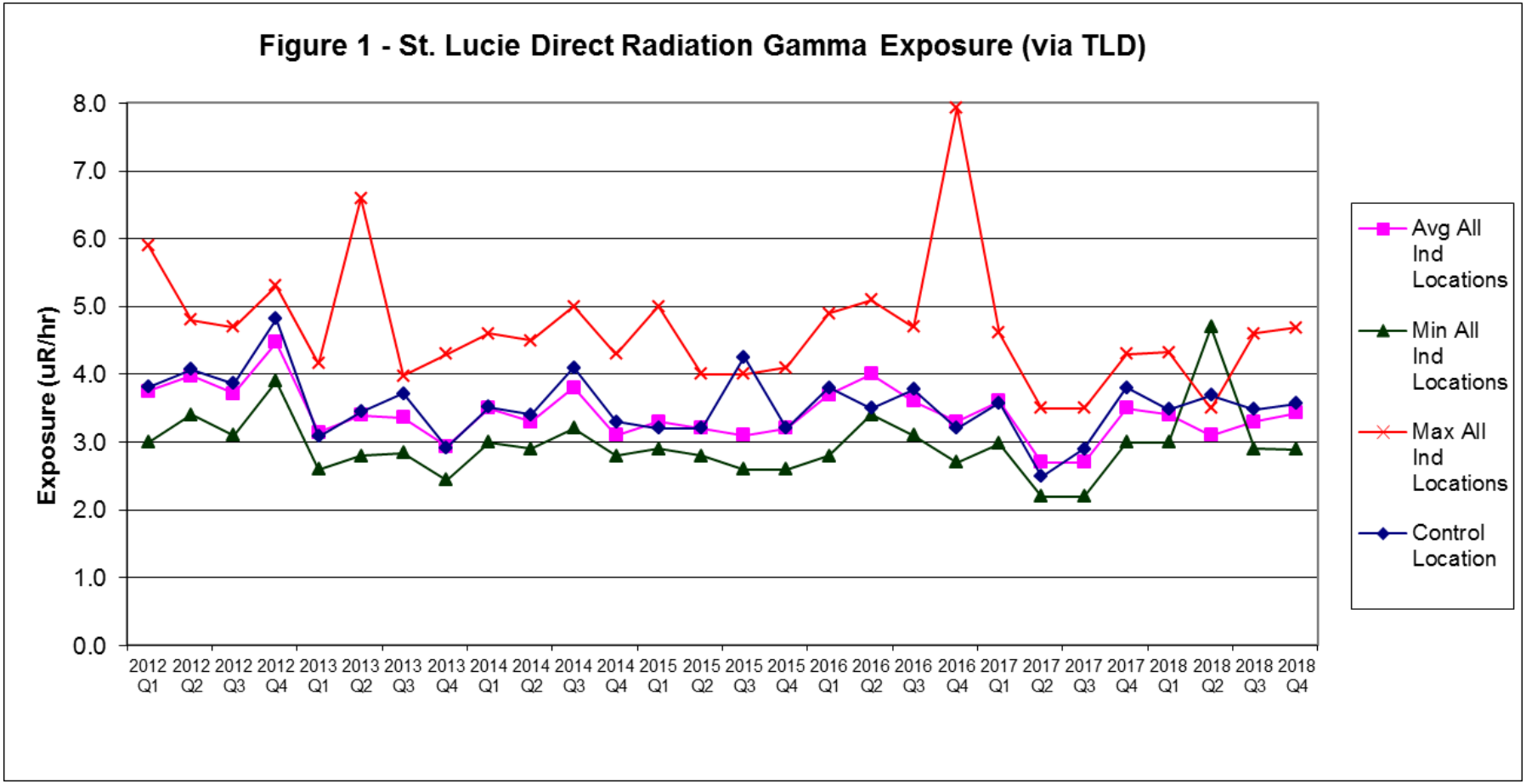
Figure 1 - St. Lucie Direct Radiation Gamma Exposure (via TLD)
Exposure (uR/hr)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2012 Q1
2012 Q2
2012 Q3
2012 Q4
2013 Q1
2013 Q2
2013 Q3
2013 Q4
2014 Q1
2014 Q2
2014 Q3
2014 Q4
2015 Q1
2015 Q2
2015 Q3
2015 Q4
2016 Q1
2016 Q2
2016 Q3
2016 Q4
2017 Q1
2017 Q2
2017 Q3
2017 Q4
2018 Q1
2018 Q2
2018 Q3
2018 Q4
Avg All Ind Locations
Min All Ind Locations
Max All Ind Locations
Control Location

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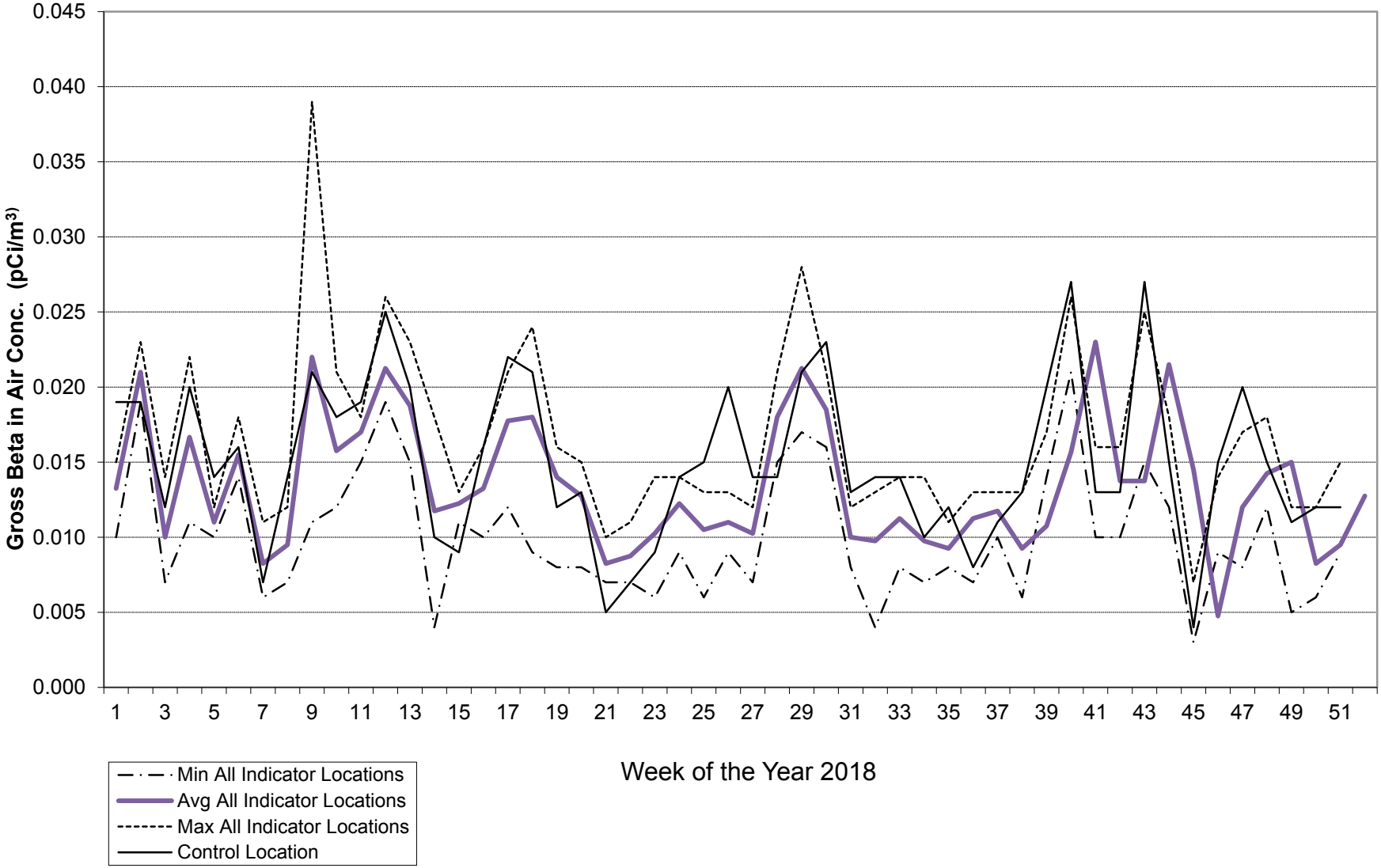
Figure 2 - St. Lucie 2018 REMP Program
Gross Beta in Air, pCi/m^3



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 2 of the 52 ODCM required samples for the indicator location and none of the 12 samples of the control location surface water samples collected. The highest value was 10.0% of the required lower limit of detection and 1.0% of the reporting level listed in ODCM Table 3.12-2. There were no indications of any other nuclides that could be attributed to plant effluents. Results 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. For the Fish Ingestion Pathway, Cs-137 was not reported for the two samples at the indicator location as well as the 2 samples at the control location. There were no indications of any other nuclides that could be 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. Cs-137 was reported in 1 of the 24 ODCM required samples and was not present in any of the 12 Control locations. The highest value was 7.5% of the required lower limit of detection and 0.3% of the reporting level listed in ODCM Table 3.12-2. There were no indications of any other nuclides that could be attributed to plant effluents. Results for broad leaf vegetation samples are summarized in Table 1.

6. Land Use Census:

   There was one change identified in the Land Use Census as compared to last year's report. There is no longer a garden present in the WNW Sector, 4 miles at 282°.

   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.

   The Land Use Census is summarized in Table 2.

7. Interlaboratory Comparison Program:

   The State of Florida laboratory participated in MAPEP Series 38, the ERA MRAD-28, and the ERA RadCheM-113. 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.

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. Measured exposure rates are consistent with exposure rates that were observed during the pre-operational surveillance program.

- Results for air particulate/radioiodine samples are consistent with measurements that were made during the pre-operational surveillance program.
- The highest value for tritium in surface water was 10.0% of the required lower limit of detection and 1.0% of the reporting level listed in ODCM Table 3.12-1. There were no indications of any other nuclides that could be attributed to plant effluents.
- The highest value for Cs-137 in broad leaf vegetation was in the control location, and 7.5% of the required lower limit of detection and 0.3% of the reporting level listed in ODCM Table 3.12-1. There were no indications of any other nuclides that could be attributed to plant effluents.
- There were no other indications in the waterborne, sediment, or food products of any other nuclides that could be 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.

TABLE 1

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, 2018
(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, 106	---	3.43 (103/104) 2.89 – 4.69	NW-10 9.6 mi., NW	4.52 (4/4) 4.32 – 4.69	3.57 (4/4) 3.48 - 3.69

Number of Non-Routine Reported Measurements = 0

TABLE 1

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, 2018
(County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection [a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean: Name [c] Distance & Direction	Location with Highest Annual Mean: Mean (f)[b] Range	Control Locations Mean (f)[b] Range
^{131}I, 256	0.012	<MDA	---	---	<MDA
Gross Beta, 257	0.0064	0.0130 (205/208) 0.0030 - 0.0390	H-08 6 mile, WNW	0.014 (52/52) 0.005 - 0.039	0.015 (52/52) 0.004 - 0.027
Composite Gamma Isotopic, 20					
^{7}Be	0.006	0.1494 (16/16) 0.099- 0.205	H-14 1 mile, SE	0.1608 (4/4) 0.1267 - 0.205	0.1621 (4/4) 0.1387 - 0.205
^{134}Cs	0.0008	<MDA	<MDA	<MDA	<MDA
^{137}Cs	0.0008	<MDA	<MDA	<MDA	<MDA
^{210}Pb	---	0.0218 (16/16) 0.0138 - 0.0375	H-14 1 mile, SE	0.0282 (4/4) <0.0212 - 0.0375	0.0104 (4/4) <0.0367 – 0.0137

Be-7 & Pb-210 are naturally occurring.

Number of Non-Routine Reported Measurements = 0

TABLE 1

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, 2018
(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] Distance & Direction	Mean (f)[b] Range	
Tritium, 64	172	213 (2/52) 127 - 299	H-15 <1 mi., ENE/E/ESE	213 (2/52) 127 - 299	<MDA (0/12)
Gamma Isotopic, 64					
^{40}K	58	378 (52/52) 308 - 452	H-15 <1 mi., ENE/E/ESE	378 (52/52) 308 - 452	356 (12/12) 296 - 424
^{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

TABLE 1

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, 2018
(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 Name[c] Distance & Direction	Location with Highest Annual Mean Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 4					
^{7}Be	56	<MDA	---	---	<MDA
^{40}K	100	506 (1/2)	H-15 <1 mi, ENE/E/ESE	506 (1/2)	218 (1/2)
^{58}Co	6	<MDA	---	---	<MDA
^{60}Co	7	<MDA	---	---	<MDA
^{134}Cs	7	<MDA	---	---	<MDA
^{137}Cs	7	<MDA	---	---	<MDA
^{210}Pb	---	<MDA	---	---	---
^{226}Ra	15	569(1/2)	H-15 <1 mi., ENE/E/ESE	569(1/2)	309(2/2) 249-368
^{232}Th	25	160(1/2)	H-15 <1 mi., ENE/E/ESE	160 (1/2)	64(1/2)
^{235}U	---	36 (1/2)	H-15 <1 mi., ENE/E/ESE	36 (1/2)	23 (1/2)
^{238}U	---	229 (2/2) 101 - 357	H-15 <1 mi., ENE/E/ESE	229 (2/2) 101 - 357	240 (1/2)

Be-7, K-40, Pb-210, Ra-226, Th-232, U-235 & U-238 are naturally occurring. Number of Non-Routine Reported Measurements = 0

TABLE 1

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, 2018
(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: Name[c] Distance & Direction	Location with Highest Annual Mean: Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 4					
^{40}K	270	1735 (2/2) 1659-1810	H-15 <1 mi., NE/ENE/E	1735 (2/2) 1659-1810	1539 (2/2) 1360-1717
^{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	---	---	357 (1/2)
^{228}Ra	58	< MDA	---	---	< MDA

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

Number of Non-Routine Reported Measurements = 0

TABLE 1

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, 2018
(County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name[c] Distance & Direction	Location with Highest Annual Mean Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 4					
^{40}K	270	2553 (2/2) 2500-2606	H-15 <1 mi., ENE/E/ESE	2553 (2/2) 2500-2606	2659 (2/2) 2590-2727
^{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

TABLE 1

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, 2018
(County, State)

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

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean: Name[c] Distance & Direction	Location with Highest Annual Mean: Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 36					
^{7}Be	64	1024 (24/24) 419 - 2297	H-52 1 mi., S/SSE	1123 (12/12) 450- 2297	973(12/12) 444 - 1548
^{40}K	120	4159 (24/24) 2586 - 5934	H-51 1 mi., N/NNW	4490 (12/12) 2586 - 5934	3302 (12/12) 2545 - 3917
^{58}Co	6	<MDA	---	---	<MDA
^{60}Co	8	<MDA	---	---	<MDA
^{131}I	8	<MDA	---	---	<MDA
^{134}Cs	8	<MDA	---	---	<MDA
^{137}Cs	8	<MDA	---	---	8 (2/12) 7-9
^{210}Pb		443 (5/24) 142 - 907	H-52 1 mi., S/SSE	539 (1/12)	543 (3/12) 234-1160
^{212}Pb	---	28 (11/24) 10-47	H-52 1 mi., S/SSE	33 (4/12) 13-47	24 (5/12) 14-38
^{226}Ra	189	377 (2/24) 345-408	H-52 1 mi., S/SSE	408 (1/12)	250 (1/12)

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

Number of Non-Routine Reported Measurements = 0

TABLE 1

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, 2018
(County, State)

NOTES

a. The LLD is an "a priori" lower limit of detection which establishes the smallest concentration of radioactive material in a sample that will yield a net count above system background that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a real signal.

LLDs in this column are at time of measurement. The MDAs reported in Attachment B for the individual samples have been corrected to the time of sample collection.

b. Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (f).

c. Specific identifying information for each sample location is provided in Attachment A.

d. Results were based upon the average net response of three elements in a TLD (thermoluminescent dosimeter).

MDA refers to minimum detectable activity.

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TABLE 1A

DEVIATIONS / MISSING DATA

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

A) Pathway: Direct Radiation Exposure

Location:	TLD: WSW-10
Dates:	12/04/17 – 03/19/18
Deviation:	Failure to Perform Continuous Monitoring
Description of Problem:	TLD was missing and lost during quarter 1 sampling by the State of Florida Bureau of Radiation Control (BRC) at the ODCM required REMP Program sampling location WSW-10; located 10 miles WSW on a utility poll.
Corrective Action:	Replaced TLD

B) Pathway: Airborne, Particulates and Radioiodines

Location:	H14, 1 miles SE
Dates:	01/16/18 – 01/23/18
Deviation:	Failure to Perform Continuous Monitoring
Description of Problem:	The pump failed during the sampling week. Estimated run time for the week was 69.4 hours out of 139.75..
Corrective Action:	Replaced the Pump

C) Pathway: Radioiodines

Location:	H34, Site Met Tower 0.5 miles N
Dates:	04/24/18 – 05/01/18
Deviation:	Failure to Perform Continuous Monitoring
Description of Problem:	The Iodine cartridge was discovered outside on top of the rain shield at time of collection. No air volume flowed through the cartridge.
Corrective Action:	Replaced the Cartridge

D) Pathway: Airborne, Particulates and Radioiodines

Location:	H30, 2 miles W
Dates:	09/25/18 - 10/02/18
Deviation:	Failure to Perform Continuous Monitoring
Description of Problem:	Power was lost at the air sample station upon arrival on 10/02/18. Near normal collection volume.
Corrective Action:	Power was not restored until 10/11/18 due to the need of temporary power.

E) Pathway: Airborne, Particulates and Radioiodines

Location:	H30, 2 miles W
Dates:	10/02/18 - 10/11/18
Deviation:	Failure to Perform Continuous Monitoring
Description of Problem:	Power was lost at the air sample station from 10/02/18- 10/11/18 .
Corrective Action:	Power was restored with alternative power on 10/11/18

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TABLE 1B

ANALYSIS WITH LLDs ABOVE THE REQUIRED DETECTION CAPABILITIES
(LLDs) Listed in ODCM TABLE 4.12-1
1/1/2018 – 12/31/2018

The values specified in ODCM Table 4.12-1, Detection Capabilities, were achieved for all samples. REMP Program sampling deviations and missing data are listed in Table 1A.

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TABLE 2

LAND USE CENSUS

The St. Lucie Annual Land Use Census Survey was performed from June through August 2018 – There was one change identified as compared to the 2017 St. Lucie Annual Land Use Census Survey. No locations were identified of potential milk-producing animals (cows or goats).

Distance to Nearest (a, b)

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

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TABLE 2

LAND USE CENSUS

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. Only gardens with an estimated total area of 500 square feet, or more, and producing green leafy vegetables are considered.

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:

Sector	Distance	Description
SSE	1.8/147	Fire Station

ATTACHMENT A

KEY TO SAMPLE LOCATIONS

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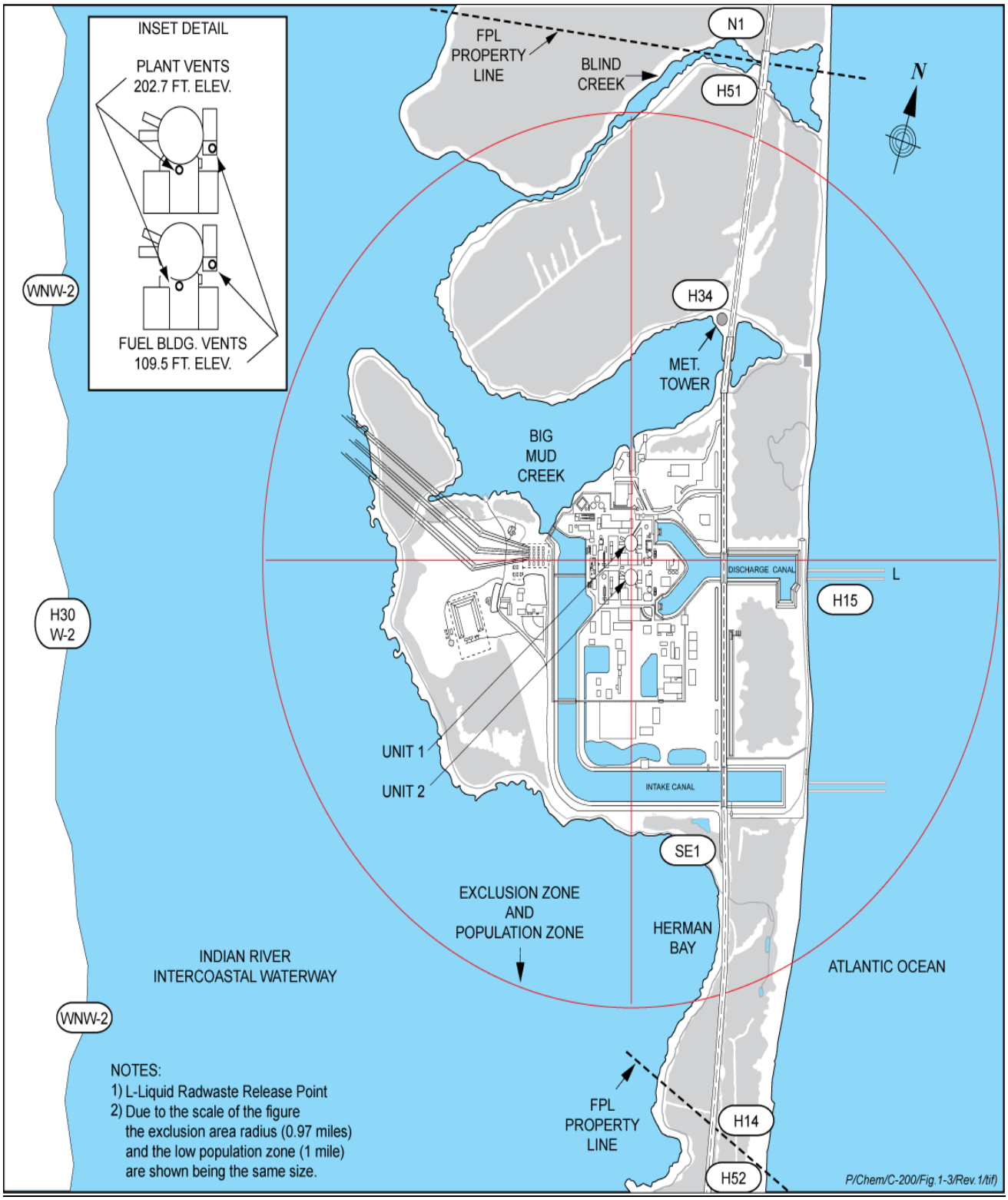
SITE AREA MAP & ENVIRONMENTAL SAMPLE LOCATIONS



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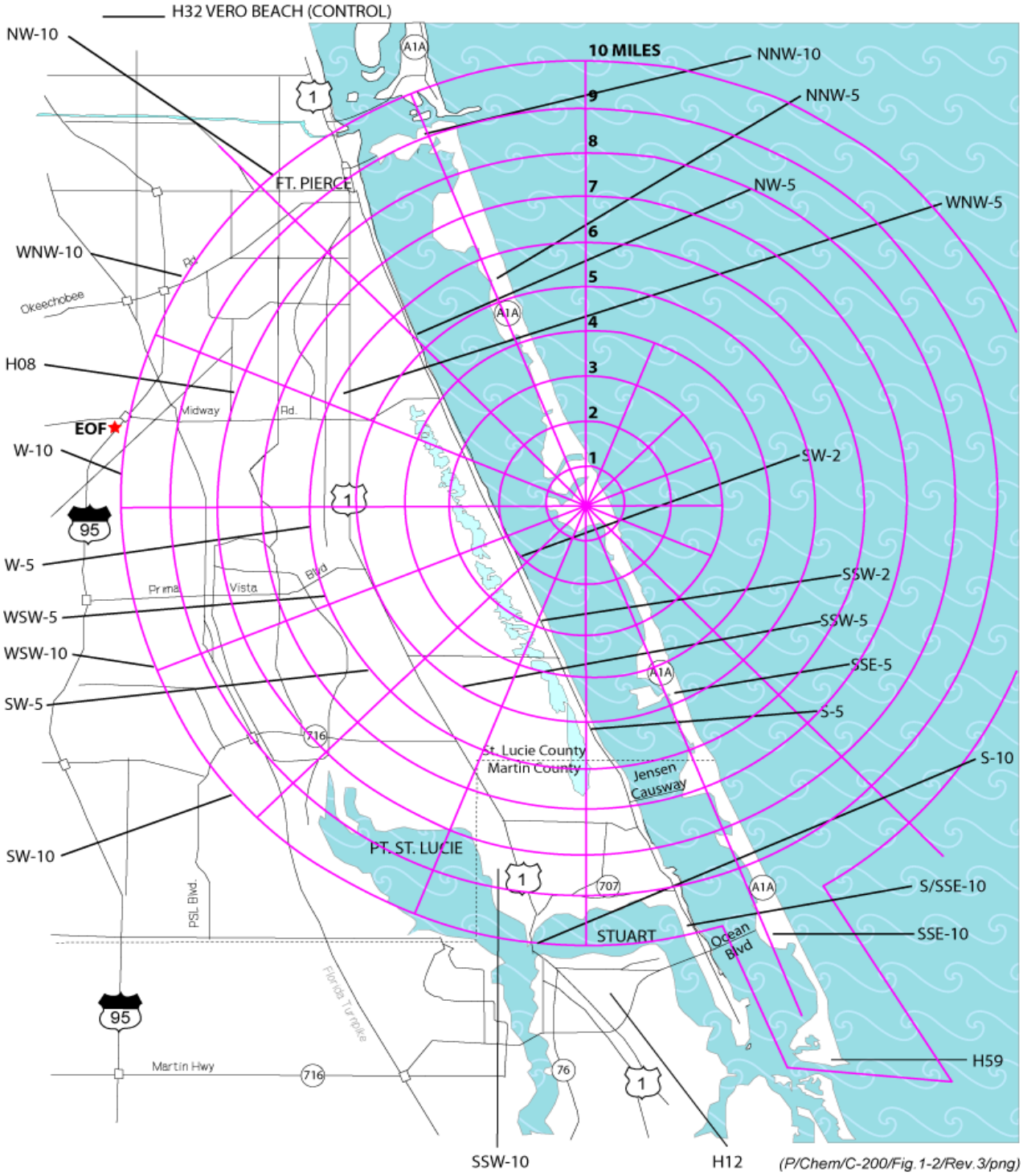
ENVIRONMENTAL SAMPLE LOCATIONS (10 MILES)



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

Location Name	Direction Sector	Approximate Distance (miles)	Description
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 and 33RD 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
Control:			
H32	NNW	18.1	U. of Florida IFAS Entomology Lab Vero Beach

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

Location Name	Direction Sector	Approximate Distance (miles)	Description
H08	WNW	6	FPL Substation, Weatherbee Rd.
H14	SE	1	On-Site, near south property line
H30	W	2	Power Line, 7609 Indian River Drive
H34	N	0.5	Onsite at Meteorological Tower
Control:			
H12	S	12	FPL Substation, SR-76 Stuart

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

Location Name	Direction Sector	Approximate Distance (miles)	Description
H15	ENE/E/SSE	<1	Atlantic Ocean, public beaches east side A1A
Control:			
H59	S/SSE	10-20	Near south end of Hutchinson Island

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

Location Name	Direction Sector	Approximate Distance (miles)	Description
H15	ENE/E/ESE	<1	Atlantic Ocean, public beaches east side A1A
Control:			
H59	S/SSE	10-20	Near south end of Hutchinson Island

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

Location Name	Direction Sector	Approximate Distance (miles)	Description
H15	ENE/E/ESE	<1	Ocean Side, Vicinity of St. Lucie Plant
Control:			
H59	S/SSE	10-20	Near south end of Hutchinson Island

SAMPLES COLLECTED: BROAD LEAF VEGETATION - FOOD PRODUCTS
SAMPLE COLLECTION FREQUENCY: MONTHLY

Location Name	Direction Sector	Approximate Distance (miles)	Description
H51	N/NNW	1	Off-Site Near North Property Line
H52	S/SSE	1	Off-Site Near South Property Line
Control:			
H59	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

2018

First Quarter 2018

Second Quarter 2018

Third Quarter 2018

Fourth Quarter 2018

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ST. LUCIE PLANT - UNITS 1 & 2

RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

FIRST QUARTER 2018

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

First Quarter, 2018

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	27	52
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	0
4.a.2. Fish	Semiannually	2	1
4.b. Broadleaf Vegetation	Monthly	3	9
			Total: 210

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are <u>not</u> significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

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

1. DIRECT RADIATION - DUAL DEPLOYED TLD's - (μR/hour)

Sample Site	Deployment 04-Dec-17 Collection 19-Mar-18		Sample Site	Deployment 04-Dec-17 Collection 19-Mar-18	
	Old	New		Old	New
N-1	3.02 ± 0.18	3.17 ± 0.28	SW-2	2.93 ± 0.27	3.28 ± 0.08
NNW-5	3.21 ± 0.24	3.61 ± 0.08	SW-5	3.79 ± 0.19	3.91 ± 0.16
NNW-10	3.74 ± 0.23	4.02 ± 0.07	SW-10	3.28 ± 0.22	3.27 ± 0.18
NW-5	3.04 ± 0.32	3.24 ± 0.46	SSW-2	3.18 ± 0.21	3.30 ± 0.21
NW-10	4.31 ± 0.51	4.32 ± 0.62	SSW-5	3.61 ± 0.32	3.79 ± 0.26
WNW-2	3.09 ± 0.27	3.22 ± 0.42	SSW-10	2.99 ± 0.26	3.04 ± 0.14
WNW-5	3.12 ± 0.15	3.34 ± 0.37	S-5	3.39 ± 0.10	3.41 ± 0.13
WNW-10	3.10 ± 0.26	3.20 ± 0.27	S-10	3.26 ± 0.27	3.31 ± 0.24
W-2	3.04 ± 0.15	3.22 ± 0.29	S/SSE-10	3.12 ± 0.40	3.31 ± 0.35
W-5	3.55 ± 0.13	3.62 ± 0.21	SSE-5	3.09 ± 0.14	3.19 ± 0.11
W-10	2.83 ± 0.33	3.08 ± 0.26	SSE-10	3.45 ± 0.05	3.43 ± 0.52
WSW-2	3.16 ± 0.07	3.36 ± 0.34	SE-1	3.04 ± 0.32	3.25 ± 0.14
WSW-5	3.15 ± 0.36	3.34 ± 0.25	H-32	3.40 ± 0.20	3.48 ± 0.26
WSW-10	*				

* - Both TLD's missing upon collection; unable to locate in vicinity around utility pole.

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

Collection Date	H08	H12	H14	H30	H34
03-Jan-18	<0.02	<0.02	<0.02	<0.02	<0.02
09-Jan-18	<0.02	<0.02	<0.02	<0.02	<0.02
17-Jan-18	<0.01	<0.01	<0.01	<0.01	<0.01
23-Jan-18	<0.03	<0.03	<0.01(A)	<0.03	<0.03
31-Jan-18	<0.01	<0.01	<0.01	<0.01	<0.01
08-Feb-18	<0.01	<0.01	<0.01	<0.01	<0.01
14-Feb-18	<0.02	<0.02	<0.02	<0.02	<0.00
21-Feb-18	<0.03	<0.03	<0.03	<0.03	<0.03
27-Feb-18	<0.02	<0.02	<0.02	<0.02	<0.02
05-Mar-18	<0.03	<0.03	<0.03	<0.03	<0.03
13-Mar-18	<0.02	<0.02	<0.02	<0.02	<0.02
19-Mar-18	<0.03	<0.03	<0.03	<0.02	<0.03
27-Mar-18	<0.02	<0.02	<0.02	<0.02	<0.02

(A) Pump failed and was replaced. Estimated run time 69.4 out of 139.75 hours.

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

Collection Date	H08	H12	H14	H30	H34
03-Jan-18	0.010 ± 0.002	0.019 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.014 ± 0.002
09-Jan-18	0.022 ± 0.003	0.019 ± 0.003	0.023 ± 0.003	0.019 ± 0.003	0.020 ± 0.003
17-Jan-18	0.014 ± 0.002	0.012 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.010 ± 0.002
23-Jan-18	0.022 ± 0.003	0.020 ± 0.003	0.014 ± 0.004(A)	0.011 ± 0.002	0.017 ± 0.003
31-Jan-18	0.011 ± 0.002	0.014 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.011 ± 0.002
08-Feb-18	0.016 ± 0.002	0.016 ± 0.002	0.018 ± 0.002	0.014 ± 0.002	0.014 ± 0.002
14-Feb-18	0.006 ± 0.002	0.007 ± 0.002	0.011 ± 0.002	0.007 ± 0.002	0.009 ± 0.002
21-Feb-18	0.009 ± 0.002	0.014 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.007 ± 0.002
27-Feb-18	0.039 ± 0.003	0.021 ± 0.003	0.011 ± 0.002	0.020 ± 0.003	0.018 ± 0.003
05-Mar-18	0.015 ± 0.002	0.018 ± 0.002	0.012 ± 0.002	0.021 ± 0.003	0.015 ± 0.002
13-Mar-18	0.017 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.015 ± 0.002
19-Mar-18	0.026 ± 0.003	0.025 ± 0.003	0.019 ± 0.002	0.020 ± 0.002	0.020 ± 0.003
27-Mar-18	0.023 ± 0.002	0.020 ± 0.002	0.022 ± 0.002	0.015 ± 0.002	0.015 ± 0.002
Average:	0.018 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.014 ± 0.001

(A) Pump failed and was replaced. Estimated run time 69.4 out of 139.75 hours.

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

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H08	0.2010 ± 0.0118	<0.0181	<0.0016	<0.0012	0.0172 ± 0.0045
H12	0.2050 ± 0.0121	<0.0187	<0.0014	<0.0012	0.0137 ± 0.0043
H14	0.2050 ± 0.0127	<0.0163	<0.0016	<0.0014	0.0250 ± 0.0049
H30	0.1560 ± 0.0109	<0.0121	<0.0014	<0.0012	0.0155 ± 0.0042
H34	0.1780 ± 0.0113	<0.0164	<0.0016	<0.0012	0.0217 ± 0.0044

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-Jan-18	<153	366 ± 26	<3	<3	<6	<4	<8	<6	<4	<3	<3	<11
	09-Jan-18	<144	348 ± 25	<3	<3	<7	<4	<8	<5	<4	<3	<3	<10
	17-Jan-18	<161	351 ± 25	<3	<3	<7	<4	<8	<5	<4	<3	<3	<12
	23-Jan-18	<159	376 ± 27	<3	<3	<7	<3	<7	<6	<4	<3	<3	<7
	31-Jan-18	<157	395 ± 27	<3	<3	<6	<4	<7	<6	<4	<3	<3	<8
	08-Feb-18	<156	391 ± 27	<3	<3	<6	<4	<7	<6	<4	<3	<3	<11
	14-Feb-18	<147	369 ± 26	<3	<3	<6	<4	<7	<6	<3	<3	<3	<11
	21-Feb-18	<155	394 ± 27	<3	<3	<7	<3	<7	<6	<4	<3	<3	<7
	27-Feb-18	<147	377 ± 26	<3	<3	<6	<4	<7	<5	<4	<3	<4	<11
	05-Mar-18	299 ± 31	383 ± 27	<4	<3	<8	<4	<8	<5	<4	<4	<4	<11
	13-Mar-18	127 ± 29	413 ± 27	<3	<3	<7	<3	<8	<5	<4	<3	<4	<11
	20-Mar-18	<152	426 ± 28	<3	<3	<6	<4	<8	<6	<3	<3	<3	<10
	27-Mar-18	<152	330 ± 25	<3	<3	<7	<3	<8	<6	<3	<3	<4	<13
H59	09-Jan-18	<144	330 ± 25	<3	<3	<7	<3	<8	<6	<3	<3	<4	<11
	13-Feb-18	<156	366 ± 26	<3	<3	<7	<4	<8	<5	<4	<3	<4	<4
	20-Mar-18	<152	375 ± 26	<4	<3	<6	<3	<6	<6	<4	<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)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	13-Feb-18	<72	<167	<9	<10	<7	<9	<760	<220	<53	<14	101 ± 40
H59	13-Feb-18	<72	<162	<8	<9	<7	<10	<738	249 ± 72	<55	<14	<175

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

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	This sample not yet collected.										
H59	This sample not yet collected.										

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

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	27-Mar-18	2500 ± 216	<20	<24	<42	<24	<56	<20	<21	<373	<102
H59	This sample not yet 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	Pb-212	Ra-226	Ra-228
H51	09-Jan-18	1028 ± 58	3599 ± 168	<11	<9	<14	<978	<19	<258	<56
	13-Feb-18	1063 ± 63	4059 ± 186	<12	<11	<13	<922	39 ± 8	<236	<52
	20-Mar-18	602 ± 64	4981 ± 242	<16	<15	<19	<1448	<31	<369	<82
H52	09-Jan-18	1299 ± 76	3193 ± 178	<14	<12	<16	<1062	<26	<307	<62
	13-Feb-18	1320 ± 76	3938 ± 198	<15	<14	<18	<1111	47 ± 7	408 ± 120	<74
	20-Mar-18	682 ± 61	4114 ± 206	<15	<13	<16	<1131	<25	<328	<68
H59	09-Jan-18	1548 ± 81	3531 ± 183	<15	<13	<16	<1039	<29	<367	<61
	13-Feb-18	1068 ± 62	2745 ± 144	<12	<9	<15	<902	38 ± 6	250 ± 68	<58
	20-Mar-18	444 ± 51	3657 ± 179	<13	<12	<16	1160 ± 367	18 ± 8	<296	<59

ST. LUCIE SITE

Supplemental Sampling

First Quarter, 2018

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	9	18
2. Airborne 2.a. Air Iodines	Weekly	3	39
2.b. Air Particulates	Weekly	3	39
3. Waterborne 3.a. Surface Water	Monthly	2	6
3.b. Shoreline Sediment	Semiannually	4	4
3.c. Beach Sand	Semiannually	3	3
3.d. Ground Water	Quarterly	10	10
4. Ingestion 4.a. Garden Crops	Annually	1	0
4.b. Citrus	Annually	1	1
			Total: 120

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are <u>not</u> significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

1. DIRECT RADIATION - DUAL DEPLOYED TLD's - (µR/hour)

Sample Site	Deployment 04-Dec-17 Collection 19-Mar-18	
	Old	New
H08	3.92 ± 0.14	3.89 ± 0.07
H09	3.33 ± 0.32	3.73 ± 0.13
H12	7.78 ± 0.57	7.51 ± 0.24
H14	3.87 ± 0.27	3.84 ± 0.32
H33	3.47 ± 0.16	3.61 ± 0.16
H34	3.37 ± 0.19	3.41 ± 0.10
H60	3.48 ± 0.19	3.80 ± 0.16
H61	4.43 ± 0.29	4.54 ± 0.41
H62	3.75 ± 0.17	4.02 ± 0.34

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

Collection Date	H09	H32	H33
03-Jan-18	<0.02	<0.02	<0.02
09-Jan-18	<0.02	<0.02	<0.02
17-Jan-18	<0.01	<0.01	<0.01
23-Jan-18	<0.03	<0.03	<0.03
31-Jan-18	<0.01	<0.01	<0.01
08-Feb-18	<0.01	<0.01	<0.01
14-Feb-18	<0.02	<0.02	<0.02
21-Feb-18	<0.03	<0.03	<0.03
27-Feb-18	<0.02	<0.02	<0.02
05-Mar-18	<0.03	<0.03	<0.03
13-Mar-18	<0.02	<0.02	<0.02
19-Mar-18	<0.03	<0.02	<0.02
27-Mar-18	<0.02	<0.02	<0.03

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

Collection Date	H09	H32	H33
03-Jan-18	0.014 ± 0.002	0.018 ± 0.002	0.011 ± 0.002
09-Jan-18	0.016 ± 0.002	0.020 ± 0.003	0.013 ± 0.002
17-Jan-18	0.010 ± 0.002	0.011 ± 0.002	<0.006
23-Jan-18	0.023 ± 0.003	0.024 ± 0.003	0.017 ± 0.003
31-Jan-18	0.013 ± 0.002	0.016 ± 0.002	0.010 ± 0.002
08-Feb-18	0.011 ± 0.002	0.016 ± 0.002	0.014 ± 0.002
14-Feb-18	0.008 ± 0.002	0.008 ± 0.002	<0.007
21-Feb-18	0.013 ± 0.002	0.008 ± 0.002	0.012 ± 0.002
27-Feb-18	0.022 ± 0.003	0.023 ± 0.003	0.011 ± 0.002
05-Mar-18	0.017 ± 0.002	0.018 ± 0.002	0.013 ± 0.002
13-Mar-18	0.020 ± 0.002	0.020 ± 0.002	0.014 ± 0.002
19-Mar-18	0.030 ± 0.003	0.027 ± 0.003	0.019 ± 0.002
27-Mar-18	0.026 ± 0.002	0.025 ± 0.002	0.019 ± 0.002
Average:	0.017 ± 0.001	0.018 ± 0.001	<0.013

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

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H09	0.2020 ± 0.0122	<0.0165	<0.0015	<0.0013	0.0147 ± 0.0044
H32	0.1610 ± 0.0108	<0.0135	<0.0016	<0.0013	0.0237 ± 0.0048
H33	0.1470 ± 0.0119	<0.0318	<0.0017	<0.0012	<0.0404

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)
H13	09-Jan-18	<152	351 ± 25	<3	<3	<8	<3	<8	<5	<4	<3	<3	<11
	13-Feb-18	<156	315 ± 24	<3	<3	<6	<3	<7	<5	<4	<3	<3	<11
	20-Mar-18	<152	425 ± 28	<4	<3	<7	<4	<8	<5	<4	<3	<3	<11
H36	09-Jan-18	<152	345 ± 25	<3	<3	<7	<4	<8	<5	<4	<3	<3	<12
	13-Feb-18	3886 ± 111	400 ± 28	<3	<3	<6	<3	<7	<6	<4	<3	<3	<12
	20-Mar-18	<152	372 ± 27	<3	<3	<7	<4	<7	<5	<4	<3	<3	<10

(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)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H13	13-Feb-18	42 ± 11	908 ± 55	<7	<6	<7	5 ± 2	186 ± 70	189 ± 53	32 ± 8	12 ± 3	107 ± 17
H16	13-Feb-18	<69	<167	<8	<9	<8	<8	<692	<252	<55	<16	<152
H19	13-Feb-18	<49	<91	<5	<6	<6	<6	<165	<149	<31	<9	<87
H36	13-Feb-18	2140 ± 104	5240 ± 259	<20	54 ± 6	<18	55 ± 7	5830 ± 1430	<437	178 ± 27	102 ± 45	2490 ± 119

3.c. BEACH SAND - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	13-Feb-18	50 ± 10	<89	<5	<5	<6	<6	<240	<142	<31	<9	40 ± 14
H16	13-Feb-18	<81	<162	<9	<9	<8	<10	<765	223 ± 82	<53	14 ± 5	<148
H19	13-Feb-18	<64	<95	<7	<7	<8	<8	326 ± 83	478 ± 67	78 ± 9	30 ± 4	145 ± 19

3.d. GROUND 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)
H70	22-Jan-18	<161	<55	<3	<4	<7	<3	<9	<6	<4	<4	<4	<13
H71	22-Jan-18	560 ± 62	350 ± 25	<3	<4	<8	<3	<10	<6	<4	<4	<4	<13
H72	22-Jan-18	<161	300 ± 25	<4	<4	<9	<5	<11	<7	<5	<5	<5	<17
H73	22-Jan-18	<161	88 ± 13	<4	<4	<7	<3	<8	<6	<4	<4	<4	<11
H74	22-Jan-18	<161	371 ± 27	<4	<4	<7	<4	<9	<6	<4	<4	<4	<13
H75	22-Jan-18	<161	264 ± 23	<4	<3	<8	<4	<8	<6	<4	<4	<4	<8
H76	22-Jan-18	<161	<51	<3	<4	<7	<4	<10	<6	<4	<4	<4	<9
H77	22-Jan-18	<159	<47	<3	<3	<6	<3	<7	<5	<4	<3	<4	<7
H78	22-Jan-18	<159	39 ± 11	<3	<4	<8	<3	<8	<6	<4	<4	<4	<7
H79	22-Jan-18	<159	41 ± 9	<3	<4	<6	<4	<8	<5	<4	<4	<4	<7

(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.

4.a. GARDEN CROP - Collard Greens - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H41	This sample not yet collected.					

4.b. CITRUS - Grapefruit - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H23	31-Jan-18	<34	1660 ± 67	<4	<4	<5

RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

SECOND QUARTER 2018

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

Second Quarter, 2018

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	27	54
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: 212

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 - DUAL DEPLOYED TLD's - (µR/hour)

Sample Site	Deployment 19-Mar-18 Collection 20-Jun-18		Sample Site	Deployment 19-Mar-18 Collection 20-Jun-18	
	Old	New		Old	New
N-1	3.20 ± 0.29	3.45 ± 0.27	SW-2	3.29 ± 0.33	3.45 ± 0.04
NNW-5	3.33 ± 0.21	3.33 ± 0.27	SW-5	3.79 ± 0.24	3.93 ± 0.18
NNW-10	3.89 ± 0.39	4.19 ± 0.36	SW-10	3.28 ± 0.24	3.62 ± 0.43
NW-5	3.26 ± 0.05	3.37 ± 0.09	SSW-2	3.31 ± 0.26	3.30 ± 0.06
NW-10	4.38 ± 0.51	4.69 ± 0.26	SSW-5	3.48 ± 0.30	4.01 ± 0.18
WNW-2	3.21 ± 0.29	3.45 ± 0.11	SSW-10	2.95 ± 0.21	3.23 ± 0.22
WNW-5	3.20 ± 0.26	3.39 ± 0.21	S-5	3.29 ± 0.08	3.50 ± 0.18
WNW-10	3.22 ± 0.51	3.48 ± 0.06	S-10	3.25 ± 0.18	3.45 ± 0.27
W-2	3.10 ± 0.35	3.30 ± 0.14	S/SSE-10	3.16 ± 0.16	3.36 ± 0.13
W-5	3.51 ± 0.11	3.87 ± 0.19	SSE-5	3.02 ± 0.30	3.32 ± 0.18
W-10	3.03 ± 0.39	3.22 ± 0.55	SSE-10	3.24 ± 0.28	3.59 ± 0.10
WSW-2	3.39 ± 0.12	3.56 ± 0.31	SE-1	3.10 ± 0.21	3.26 ± 0.21
WSW-5	3.13 ± 0.25	3.41 ± 0.21	H-32	3.57 ± 0.49	3.69 ±0.26
WSW-10	2.85 ± 0.16	3.10 ± 0.09			

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

Collection Date	H08	H12	H14	H30	H34
03-Apr-18	<0.03	<0.03	<0.03	<0.03	<0.03
10-Apr-18	<0.03	<0.03	<0.03	<0.02	<0.03
17-Apr-18	<0.02	<0.03	<0.03	<0.02	<0.02
24-Apr-18	<0.02	<0.02	<0.02	<0.02	<0.02
01-May-18	<0.02	<0.02	<0.02	<0.02	(A)
08-May-18	<0.02	<0.02	<0.02	<0.02	<0.02
14-May-18	<0.02	<0.02	<0.02	<0.02	<0.02
23-May-18	<0.01	<0.01	<0.01	<0.01	<0.01
29-May-18	<0.03	<0.03	<0.03	<0.03	<0.03
05-Jun-18	<0.02	<0.02	<0.02	<0.02	<0.02
12-Jun-18	<0.02	<0.02	<0.02	<0.02	<0.02
20-Jun-18	<0.01	<0.01	<0.01	<0.01	<0.01
26-Jun-18	<0.02	<0.02	<0.02	<0.02	<0.02

(A) This is a non-collected sample. The iodine cartridge was discovered outside on top of the rain shield at time of collection, hence no air volume flowed through the cartridge.

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

Collection Date	H08	H12	H14	H30	H34
03-Apr-18	0.012 ± 0.002	0.010 ± 0.002	0.013 ± 0.002	0.004 ± 0.001	0.018 ± 0.002
10-Apr-18	0.012 ± 0.002	0.009 ± 0.002	0.011 ± 0.002	0.013 ± 0.002	0.013 ± 0.002
17-Apr-18	0.014 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.010 ± 0.002	0.016 ± 0.002
24-Apr-18	0.017 ± 0.002	0.022 ± 0.002	0.021 ± 0.002	0.012 ± 0.002	0.021 ± 0.002
01-May-18	0.019 ± 0.002	0.021 ± 0.002	0.024 ± 0.002	0.009 ± 0.002	0.020 ± 0.002
08-May-18	0.016 ± 0.002	0.012 ± 0.002	0.016 ± 0.002	0.008 ± 0.002	0.016 ± 0.002
14-May-18	0.015 ± 0.002	0.013 ± 0.002	0.014 ± 0.002	0.008 ± 0.002	0.014 ± 0.002
23-May-18	0.008 ± 0.001	0.005 ± 0.001	0.010 ± 0.002	0.007 ± 0.001	0.008 ± 0.001
29-May-18	0.007 ± 0.002	0.007 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.011 ± 0.002
05-Jun-18	0.006 ± 0.002	0.009 ± 0.002	0.014 ± 0.002	0.009 ± 0.002	0.012 ± 0.002
12-Jun-18	0.013 ± 0.002	0.014 ± 0.002	0.009 ± 0.002	0.013 ± 0.002	0.014 ± 0.002
20-Jun-18	0.011 ± 0.002	0.015 ± 0.002	0.013 ± 0.002	0.006 ± 0.001	0.012 ± 0.002
26-Jun-18	0.012 ± 0.002	0.020 ± 0.003	0.010 ± 0.002	0.013 ± 0.002	0.009 ± 0.002
Average:	0.013 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.009 ± 0.001	0.014 ± 0.001

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

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H08	0.1391 ± 0.0115	<0.0158	<0.0015	<0.0012	<0.0207
H12	0.1432 ± 0.0114	<0.0143	<0.0013	<0.0012	0.0071 ± 0.0036
H14	0.1767 ± 0.0138	<0.0244	<0.0015	<0.0011	0.0375 ± 0.0146
H30	0.0990 ± 0.0096	<0.0139	<0.0010	<0.0012	0.0138 ± 0.0037
H34	0.1754 ± 0.0150	<0.0250	<0.0015	<0.0012	<0.0392

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	02-Apr-18	<155	393 ± 26	<3	<4	<8	<3	<7	<6	<4	<3	<4	<8
	10-Apr-18	<155	377 ± 26	<3	<3	<7	<3	<7	<6	<4	<3	<3	<9
	17-Apr-18	<158	366 ± 27	<3	<3	<7	<3	<7	<5	<4	<3	<4	<11
	24-Apr-18	<157	387 ± 27	<3	<4	<7	<3	<8	<5	<4	<3	<4	<10
	01-May-18	<157	403 ± 27	<3	<3	<6	<4	<9	<6	<3	<3	<3	<11
	08-May-18	<157	422 ± 28	<3	<3	<6	<3	<7	<5	<3	<3	<4	<10
	14-May-18	<158	364 ± 26	<3	<3	<7	<3	<8	<6	<4	<3	<3	<7
	23-May-18	<153	353 ± 25	<3	<3	<6	<3	<7	<5	<3	<3	<3	<12
	29-May-18	<153	361 ± 26	<3	<3	<7	<4	<7	<6	<3	<3	<3	<11
	05-Jun-18	<153	382 ± 27	<3	<3	<7	<4	<7	<5	<3	<3	<4	<11
	12-Jun-18	<159	374 ± 27	<3	<3	<7	<3	<7	<5	<4	<3	<4	<12
	20-Jun-18	<155	362 ± 26	<3	<4	<7	<4	<8	<6	<4	<3	<4	<8
	26-Jun-18	<155	391 ± 28	<3	<3	<7	<3	<6	<5	<4	<3	<4	<12
H59	10-Apr-18	<155	339 ± 25	<3	<3	<8	<4	<7	<5	<4	<3	<3	<8
	11-May-18	<153	424 ± 39	<5	<5	<15	<6	<16	<8	<8	<5	<6	<9
	20-Jun-18	<159	296 ± 40	<6	<5	<12	<7	<12	<10	<8	<5	<7	<11

(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)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232
	These samples were previously collected.									

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

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	12-Jun-18	1810 ± 178	<23	<25	<50	<26	<62	<22	<22	<457	<106
H59	01-May-18	1360 ± 124	<20	<20	<43	<20	<42	<21	<22	357 ± 90	<99

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

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	This sample was previously collected.										
H59	08-Jun-18	2590 ± 167	<19	<15	<37	<19	<39	<19	<20	<369	<70

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	Pb-212	Ra-226	Ra-228
H51	10-Apr-18	703 ± 54	4864 ± 214	<13	<12	<14	<958	28 ± 9	345 ± 86	<56
	11-May-18	802 ± 40	4628 ± 166	<10	<7	<8	<246	<15	<183	<35
	20-Jun-18	1117 ± 67	4623 ± 209	<14	<11	<14	907 ± 354	24 ± 7	<270	<53
H52	10-Apr-18	739 ± 53	4002 ± 188	<13	<11	<14	<1061	43 ± 9	<274	<60
	11-May-18	1224 ± 64	2868 ± 142	<12	<9	<14	<758	<21	<227	<43
	20-Jun-18	1136 ± 49	3796 ± 145	<9	<8	<7	<347	<16	<183	<35
H59	10-Apr-18	632 ± 60	3412 ± 181	<15	<14	<16	<1069	<28	<295	<67
	11-May-18	835 ± 44	3458 ± 140	<11	<8	<9	<371	<17	<197	<36
	20-Jun-18	1308 ± 49	3700 ± 137	<8	<6	<9	234 ± 65	<15	<163	<28

ST. LUCIE SITE

Supplemental Sampling

Second Quarter, 2018

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	9	18
2. Airborne			
2.a. Air Iodines	Weekly	3	39
2.b. Air Particulates	Weekly	3	39
3. Waterborne			
3.a. Surface Water	Monthly	2	6
3.b. Shoreline Sediment	Semiannually	4	0
3.c. Beach Sand	Semiannually	3	0
3.d. Ground Water	Quarterly	10	10
4. Ingestion			
4.a. Garden Crop	Annually	1	0
4.b. Citrus	Annually	1	0

Total: 112

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.

1. DIRECT RADIATION - DUAL DEPLOYED TLD's - (µR/hour)

Sample Site	Deployment 19-Mar-18 Collection 20-Jun-18	
	Old	New
H08	3.71 ± 0.17	3.90 ± 0.50
H09	3.62 ± 0.01	3.90 ± 0.26
H12	7.75 ± 1.01	8.00 ± 0.52
H14	8.08 ± 0.20	4.02 ± 0.50
H33	3.54 ± 0.21	3.98 ± 0.21
H34	3.41 ± 0.47	3.63 ± 0.25
H60	3.46 ± 0.33	3.84 ± 0.11
H61	4.44 ± 0.52	4.66 ± 0.47
H62	4.12 ± 0.22	4.07 ± 0.39

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

Collection Date	H09	H32	H33
03-Apr-18	<0.03	<0.03	<0.03
10-Apr-18	<0.02	<0.03	<0.03
17-Apr-18	<0.03	<0.02	<0.03
24-Apr-18	<0.02	<0.02	<0.02
01-May-18	<0.02	<0.02	<0.02
08-May-18	<0.02	<0.02	<0.02
14-May-18	<0.02	<0.02	<0.02
23-May-18	<0.01	<0.01	<0.01
29-May-18	<0.03	<0.03	<0.03
05-Jun-18	<0.02	<0.02	<0.02
12-Jun-18	<0.02	<0.02	<0.02
20-Jun-18	<0.01	<0.01	<0.01
26-Jun-18	<0.02	<0.02	<0.03

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

Collection Date	H09	H32	H33
03-Apr-18	0.016 ± 0.002	0.010 ± 0.002	0.012 ± 0.002
10-Apr-18	0.012 ± 0.002	0.015 ± 0.002	0.011 ± 0.002
17-Apr-18	0.015 ± 0.002	0.017 ± 0.002	0.011 ± 0.002
24-Apr-18	0.021 ± 0.002	0.021 ± 0.002	0.015 ± 0.002
01-May-18	0.018 ± 0.002	0.019 ± 0.002	0.011 ± 0.002
08-May-18	0.016 ± 0.002	0.019 ± 0.002	0.013 ± 0.002
14-May-18	0.015 ± 0.002	0.017 ± 0.002	0.015 ± 0.002
23-May-18	0.007 ± 0.001	0.010 ± 0.002	0.005 ± 0.001
29-May-18	0.011 ± 0.002	0.008 ± 0.002	0.007 ± 0.002
05-Jun-18	0.013 ± 0.002	0.014 ± 0.002	0.011 ± 0.002
12-Jun-18	0.012 ± 0.002	0.014 ± 0.002	0.017 ± 0.002
20-Jun-18	0.015 ± 0.002	0.010 ± 0.002	0.008 ± 0.002
26-Jun-18	0.015 ± 0.002	0.012 ± 0.002	0.008 ± 0.002
Average:	0.014 ± 0.001	0.014 ± 0.001	0.011 ± 0.001

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

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H09	0.1760 ± 0.0140	<0.0253	<0.0013	<0.0014	<0.0396
H32	0.1491 ± 0.0130	<0.0231	<0.0013	<0.0008	0.0317 ± 0.0125
H33	0.1181 ± 0.0103	<0.0147	<0.0014	<0.0010	<0.0198

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)
H13	10-Apr-18	<155	376 ± 26	<4	<3	<8	<4	<8	<6	<4	<3	<4	<8
	11-May-18	<153	337 ± 25	<3	<3	<7	<4	<8	<6	<5	<3	<3	<5
	20-Jun-18	<159	202 ± 20	<3	<4	<6	<3	<7	<5	<4	<3	<3	<7
H36	10-Apr-18	<155	392 ± 26	<3	<3	<7	<4	<8	<6	<4	<3	<4	<7
	11-May-18	<153	372 ± 27	<3	<3	<7	<3	<8	<5	<5	<3	<3	<5
	20-Jun-18	<159	357 ± 25	<3	<3	<8	<3	<7	<5	<5	<3	<4	<6

(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)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	Others
These samples were previously collected.											

3.c. BEACH SAND - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	Others
These samples were previously collected.											

3.d. GROUND 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)
H70	19-Apr-18	<158	55 ± 12	<3	<3	<7	<3	<8	<6	<5	<3	<3	<4
H71	19-Apr-18	374 ± 54	359 ± 26	<3	<3	<7	<3	<8	<6	<5	<3	<4	<6
H72	19-Apr-18	<158	320 ± 37	<6	<6	<13	<8	<14	<10	<9	<6	<7	<10
H73	19-Apr-18	<146	93 ± 14	<3	<4	<6	<3	<7	<6	<5	<4	<4	<6
H74	19-Apr-18	<158	359 ± 39	<6	<7	<13	<7	<13	<10	<10	<6	<7	<12
H75	19-Apr-18	<146	258 ± 22	<3	<3	<8	<4	<9	<6	<6	<3	<4	<6
H76	19-Apr-18	<159	<95	<6	<6	<11	<6	<12	<10	<9	<5	<7	<10
H77	19-Apr-18	<158	<41	<3	<3	<7	2	<6	<6	<6	<3	<3	<5
H78	19-Apr-18	<158	<101	<5	<6	<11	<6	<13	<10	<9	<5	<6	<12
H79	19-Apr-18	<158	30 ± 10	<3	<3	<6	<3	<8	<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.

4.a. GARDEN CROP - Mixed Greens - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H41	02-Apr-18	<90	2171 ± 118	<10	<8	<13

4.b. CITRUS - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H23	This sample was previously collected.					

RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

THIRD QUARTER 2018

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

Third Quarter, 2018

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	27	54
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	0
4.a.2. Fish	Semiannually	2	2
4.b. Broadleaf Vegetation	Monthly	3	9
			Total: 213

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 - (μR/hour)

Sample Site	Deployment Collection	20-Jun-18 11-Sep-18	Sample Site	Deployment Collection	20-Jun-18 11-Sep-18
	Old	New		Old	New
N-1	3.02 ± 0.31	3.29 ± 0.26	SW-2	3.09 ± 0.47	3.13 ± 0.43
NNW-5	2.98 ± 0.24	3.18 ± 0.39	SW-5	3.69 ± 0.11	3.86 ± 0.16
NNW-10	3.81 ± 0.21	4.01 ± 0.21	SW-10	3.10 ± 0.21	3.31 ± 0.42
NW-5	2.80 ± 0.28	3.14 ± 0.22	SSW-2	3.03 ± 0.12	3.27 ± 0.31
NW-10	4.14 ± 0.17	4.60 ± 0.40	SSW-5	3.62 ± 0.31	3.71 ± 0.42
WNW-2	3.11 ± 0.05	3.12 ± 0.30	SSW-10	2.89 ± 0.32	2.89 ± 0.17
WNW-5	3.06 ± 0.15	3.19 ± 0.37	S-5	3.49 ± 0.38	3.50 ± 0.33
WNW-10	3.01 ± 0.10	3.17 ± 0.24	S-10	3.27 ± 0.10	3.18 ± 0.14
W-2	2.79 ± 0.10	3.11 ± 0.31	S/SSE-10	3.04 ± 0.15	3.25 ± 0.21
W-5	3.44 ± 0.14	3.66 ± 0.37	SSE-5	2.91 ± 0.32	3.18 ± 0.33
W-10	2.54 ± 0.35	2.99 ± 0.17	SSE-10	3.24 ± 0.61	3.50 ± 0.14
WSW-2	3.19 ± 0.17	3.23 ± 0.40	SE-1	3.10 ± 0.15	3.03 ± 0.48
WSW-5	3.16 ± 0.42	3.34 ± 0.27	H-32	3.35 ± 0.09	3.48 ± 0.19
WSW-10	2.88 ± 0.14	3.04 ± 0.17			

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

Collection Date	H08	H12	H14	H30	H34
03-Jul-18	<0.02	<0.02	<0.02	<0.02	<0.02
10-Jul-18	<0.02	<0.02	<0.02	<0.02	<0.02
18-Jul-18	<0.02	<0.02	<0.02	<0.02	<0.02
24-Jul-18	<0.03	<0.02	<0.03	<0.03	<0.03
30-Jul-18	<0.03	<0.03	<0.03	<0.03	<0.03
07-Aug-18	<0.02	<0.02	<0.02	<0.02	<0.02
14-Aug-18	<0.02	<0.02	<0.02	<0.02	<0.02
20-Aug-18	<0.03	<0.03	<0.03	<0.03	<0.03
28-Aug-18	<0.02	<0.02	<0.02	<0.02	<0.02
04-Sep-18	<0.02	<0.02	<0.02	<0.02	<0.02
11-Sep-18	<0.02	<0.02	<0.02	<0.02	<0.02
18-Sep-18	<0.02	<0.02	<0.02	<0.02	<0.02
27-Sep-18	<0.02	<0.02	<0.02	<0.02	<0.02

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

Collection Date	H08	H12	H14	H30	H34
03-Jul-18	0.012 ± 0.002	0.014 ± 0.002	0.010 ± 0.002	0.007 ± 0.002	0.012 ± 0.002
10-Jul-18	0.021 ± 0.002	0.014 ± 0.002	0.018 ± 0.002	0.015 ± 0.002	0.018 ± 0.002
18-Jul-18	0.028 ± 0.002	0.021 ± 0.002	0.017 ± 0.002	0.019 ± 0.002	0.021 ± 0.002
24-Jul-18	0.019 ± 0.002	0.023 ± 0.003	0.021 ± 0.003	0.016 ± 0.002	0.018 ± 0.002
30-Jul-18	0.008 ± 0.002	0.013 ± 0.002	0.011 ± 0.002	0.009 ± 0.002	0.012 ± 0.002
07-Aug-18	0.012 ± 0.002	0.014 ± 0.002	0.013 ± 0.002	0.004 ± 0.001	0.010 ± 0.002
14-Aug-18	0.010 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.008 ± 0.002	0.013 ± 0.002
20-Aug-18	0.014 ± 0.002	0.010 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.009 ± 0.002
28-Aug-18	0.008 ± 0.001	0.012 ± 0.002	0.010 ± 0.002	0.008 ± 0.001	0.011 ± 0.002
04-Sep-18	0.012 ± 0.002	0.008 ± 0.002	0.013 ± 0.002	0.007 ± 0.002	0.013 ± 0.002
11-Sep-18	0.011 ± 0.002	0.011 ± 0.002	0.013 ± 0.002	0.010 ± 0.002	0.013 ± 0.002
18-Sep-18	0.008 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.006 ± 0.002	0.010 ± 0.002
27-Sep-18	0.010 ± 0.002	0.015 ± 0.002	0.011 ± 0.002	0.008 ± 0.001	0.014 ± 0.002
Average:	0.013 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.009 ± 0.001	0.013 ± 0.001

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

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H08	0.1303 ± 0.0105	<0.0188	<0.0012	<0.0012	<0.0368
H12	0.1387 ± 0.0105	<0.0246	<0.0013	<0.0011	<0.0367
H14	0.1267 ± 0.0090	<0.0121	<0.0014	<0.0009	0.0221 ± 0.0046
H30	0.1060 ± 0.0095	<0.0222	<0.0015	<0.0014	<0.0364
H34	0.1409 ± 0.0093	<0.0100	<0.0013	<0.0011	<0.0193

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-18	<148	337 ± 25	<3	<4	<11	<4	<8	<7	<37	<3	<3	<16
	10-Jul-18	<137	331 ± 40	<6	<6	<15	<6	<14	<10	<33	<5	<7	<22
	18-Jul-18	<143	402 ± 27	<3	<4	<9	<3	<7	<6	<12	<3	<4	<6
	24-Jul-18	<143	417 ± 28	<3	<3	<7	<4	<7	<6	<7	<3	<4	<6
	30-Jul-18	<142	406 ± 27	<3	<4	<7	<4	<8	<6	<7	<3	<4	<5
	06-Aug-18	<147	390 ± 27	<3	<3	<7	<4	<7	<5	<5	<4	<3	<5
	14-Aug-18	<143	392 ± 27	<4	<3	<7	<4	<8	<5	<4	<3	<4	<12
	20-Aug-18	<143	383 ± 27	<4	<3	<7	<4	<7	<6	<4	<3	<3	<12
	28-Aug-18	<143	367 ± 26	<3	<3	<7	<3	<8	<5	<4	<3	<3	<11
	04-Sep-18	<143	313 ± 24	<3	<3	<7	<4	<6	<6	<3	<4	<4	<12
	12-Sep-18	<143	373 ± 26	<3	<3	<6	<3	<8	<6	<3	<3	<4	<11
	18-Sep-18	<148	395 ± 27	<4	<3	<7	<4	<8	<6	<4	<3	<3	<11
	27-Sep-18	<142	342 ± 25	<3	<3	<8	<4	<7	<5	<4	<3	<3	<10
H59	10-Jul-18	<143	316 ± 39	<5	<8	<19	<6	<17	<13	<33	<5	<6	<24
	06-Aug-18	<142	356 ± 40	<5	<5	<13	<7	<13	<10	<11	<6	<6	<7
	12-Sep-18	<148	369 ± 26	<3	<4	<7	<4	<6	<5	<4	<4	<4	<7

(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)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	14-Aug-18	<95	506 ± 60	<10	<10	<9	<12	<787	569 ± 89	160 ± 15	36 ± 6	357 ± 35
H59	14-Aug-18	45 ± 12	218 ± 23	<6	<5	<7	<7	309 ± 62	368 ± 45	64 ± 6	23 ± 3	240 ± 16

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

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	This sample not yet collected.										
H59	This sample not yet collected.										

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

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	13-Sep-18	2606 ± 189	<21	<20	<48	<22	<53	<17	<19	<358	<86
H59	27-Sep-18	2727 ± 169	<16	<19	<33	<16	<35	<16	<20	<352	<73

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	Pb-212	Ra-226	Ra-228
H51	10-Jul-18	939 ± 43	4455 ± 161	<10	<9	<9	142 ± 58	<17	<185	<37
	06-Aug-18	948 ± 56	4328 ± 189	<13	<10	<14	<848	<24	<229	<55
	12-Sep-18	1630 ± 59	4857 ± 174	<9	<8	<10	326 ± 52	10 ± 4	<204	<36
H52	10-Jul-18	961 ± 39	3909 ± 142	<10	<8	<8	<237	<15	<166	<34
	06-Aug-18	1011 ± 57	3729 ± 165	<13	<9	<12	<990	<19	<213	<47
	12-Sep-18	1315 ± 79	4854 ± 229	<14	<15	<17	<1114	<28	<323	<73
H59	10-Jul-18	703 ± 33	3456 ± 129	<9	<8	<8	<215	<16	<160	<32
	07-Aug-18	742 ± 36	3354 ± 129	<9	<7	<9	<292	<13	<164	<28
	12-Sep-18	1445 ± 74	2545 ± 143	<14	<12	<17	<1081	<24	<324	<51

ST. LUCIE SITE

Supplemental Sampling

Third Quarter, 2018

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	9	18
2. Airborne			
2.a. Air Iodines	Weekly	3	39
2.b. Air Particulates	Weekly	3	39
3. Waterborne			
3.a. Surface Water	Monthly	2	6
3.b. Shoreline Sediment	Semiannually	4	4
3.c. Beach Sand	Semiannually	3	3
3.d. Ground Water	Quarterly	10	10
4. Ingestion			
4.a. Garden Crops	Annually	1	0
4.b. Citrus	Annually	1	0
			Total: 119

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.

1. DIRECT RADIATION - TLD's - (μR/hour)

Sample Site	Deployment 20-Jun-18 Collection 11-Sep-18	
	Old	New
H08	3.61 ± 0.34	3.71 ± 0.38
H09	3.57 ± 0.09	3.77 ± 0.59
H12	7.63 ± 0.47	7.71 ± 0.44
H14	3.52 ± 0.58	3.67 ± 0.40
H33	3.47 ± 0.32	3.57 ± 0.41
H34	3.17 ± 0.13	3.40 ± 0.27
H60	3.50 ± 0.52	3.61 ± 0.51
H61	4.43 ± 0.15	4.66 ± 0.37
H62	3.68 ± 0.64	3.86 ± 0.39

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

Collection Date	H09	H32	H33
03-Jul-18	<0.02	<0.02	<0.02
10-Jul-18	<0.02	<0.02	<0.02
18-Jul-18	<0.02	<0.20(A)	<0.02
24-Jul-18	<0.02	<0.02	<0.02
30-Jul-18	<0.03	<0.03	<0.03
07-Aug-18	<0.02	<0.02	<0.02
14-Aug-18	<0.02	<0.02	<0.02
20-Aug-18	<0.03	<0.03	<0.03
28-Aug-18	<0.02	<0.02	<0.02
04-Sep-18	<0.02	<0.02	<0.02
11-Sep-18	<0.02	<0.02	<0.02
18-Sep-18	<0.02	<0.02	<0.02
27-Sep-18	<0.02	<0.02	<0.02

(A) Pump failed and was replaced. Estimated run time 15.8 out of 193.5 hours.

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

Collection Date	H09	H32	H33
03-Jul-18	0.008 ± 0.002	0.013 ± 0.002	0.009 ± 0.002
10-Jul-18	0.018 ± 0.002	0.021 ± 0.002	0.017 ± 0.002
18-Jul-18	0.023 ± 0.002	<0.062(A)	0.021 ± 0.002
24-Jul-18	0.022 ± 0.003	0.019 ± 0.002	0.020 ± 0.002
30-Jul-18	0.012 ± 0.002	0.013 ± 0.002	0.012 ± 0.002
07-Aug-18	0.015 ± 0.002	0.013 ± 0.002	0.009 ± 0.002
14-Aug-18	0.013 ± 0.002	0.015 ± 0.002	0.013 ± 0.002
20-Aug-18	0.016 ± 0.002	0.011 ± 0.002	0.007 ± 0.002
28-Aug-18	0.010 ± 0.002	0.011 ± 0.002	0.011 ± 0.002
04-Sep-18	0.010 ± 0.002	0.010 ± 0.002	0.009 ± 0.002
11-Sep-18	0.014 ± 0.002	0.010 ± 0.002	0.011 ± 0.002
18-Sep-18	0.007 ± 0.002	0.009 ± 0.002	0.014 ± 0.002
27-Sep-18	0.012 ± 0.002	0.013 ± 0.002	0.011 ± 0.002
Average:	0.014 ± 0.001	<0.017	0.013 ± 0.001

(A) Pump failed and was replaced. Estimated run time 15.8 out of 193.5 hours.

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

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H09	0.1273 ± 0.0089	<0.0181	<0.0014	<0.0012	0.0138 ± 0.0038
H32	0.1260 ± 0.0093	<0.0154	<0.0016	<0.0011	<0.0218
H33	0.0868 ± 0.0093	<0.0231	<0.0013	<0.0013	<0.0361

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)
H13	10-Jul-18	<142	218 ± 21	<3	<4	<10	<4	<8	<6	<23	<3	<4	<11
	06-Aug-18	<147	311 ± 39	<6	<6	<14	<5	<13	<11	<8	<5	<6	<10
	12-Sep-18	<143	302 ± 24	<3	<3	<6	<4	<7	<5	<3	<3	<3	<10
H36	10-Jul-18	<148	397 ± 27	<3	<4	<9	<4	<8	<6	<19	<3	<3	<10
	06-Aug-18	<143	430 ± 28	<3	<4	<8	<4	<8	<6	<7	<3	<3	<5
	12-Sep-18	327 ± 50	368 ± 27	<4	<3	<7	<4	<7	<5	<4	<3	<4	<8

(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)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H13	14-Aug-18	210 ± 19	272 ± 28	<5	<5	<6	<6	267 ± 58	304 ± 45	58 ± 6	19 ± 3	<106
H16	16-Aug-18	<91	261 ± 48	<10	<9	<8	<10	<810	331 ± 68	63 ± 11	21 ± 4	215 ± 33
H19	14-Aug-18	<91	372 ± 50	<8	<9	<8	<10	<957	569 ± 79	<52	36 ± 5	129 ± 39
H36	16-Aug-18	505 ± 40	4154 ± 162	<14	132 ± 5	<13	33 ± 3	4207 ± 289	995 ± 98	257 ± 15	63 ± 6	1027 ± 42

3.c. BEACH SAND - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	14-Aug-18	172 ± 18	132 ± 21	<6	<5	<6	<6	208 ± 58	<123	54 ± 6	18 ± 9	152 ± 14
H16	16-Aug-18	52 ± 12	138 ± 20	<6	<6	<6	<7	337 ± 58	494 ± 52	76 ± 6	31 ± 3	241 ± 16
H19	14-Aug-18	135 ± 25	168 ± 41	<8	<9	<8	<9	<888	400 ± 80	61 ± 9	25 ± 5	145 ± 39

3.d. GROUND 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)
H70	26-Jul-18	<143	33 ± 9	<3	<4	<7	<3	<8	<5	<9	<3	<3	<6
H71	26-Jul-18	441 ± 52	314 ± 40	<6	<7	<14	<7	<13	<11	<17	<5	<6	<14
H72	26-Jul-18	<137	377 ± 26	<3	<3	<8	<4	<8	<6	<10	<3	<3	<6
H73	26-Jul-18	<143	61 ± 26	<6	<6	<13	<6	<11	<10	<16	<5	<7	<12
H74	26-Jul-18	<147	318 ± 25	<3	<3	<8	<3	<8	<6	<10	<4	<3	<5
H75	26-Jul-18	<147	<39	<3	<4	<8	<3	<7	<6	<8	<3	<3	<6
H76	26-Jul-18	<147	335 ± 40	<6	<7	<15	<6	<14	<11	<16	<5	<7	<12
H77	26-Jul-18	<147	<82	<7	<5	<11	<5	<12	<10	<16	<4	<6	<13
H78	26-Jul-18	<147	42 ± 10	<3	<4	<7	<4	<7	<5	<10	<3	<4	<7
H79	26-Jul-18	<147	91 ± 27	<5	<7	<13	<6	<11	<10	<18	<5	<7	<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.

4.a. GARDEN CROPS - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H41	This sample was previously collected.					

4.b. CITRUS - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H23	This sample was previously collected.					

RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

FOURTH QUARTER 2018

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

Fourth Quarter, 2018

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	27	54
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	0
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	2	2
4.a.2. Fish	Semiannually	2	0
4.b. Broadleaf Vegetation	Monthly	3	9
			Total: 209

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 - (μR/hour)

Sample Site	Deployment 11-Sep-18 Collection 05-Dec-18		Sample Site	Deployment 11-Sep-18 Collection 05-Dec-18	
	Old	New		Old	New
N-1	3.44 ± 0.50	3.50 ± 0.71	SW-2	3.59 ± 0.36	3.21 ± 0.31
NNW-5	3.60 ± 0.13	3.44 ± 0.22	SW-5	4.18 ± 0.22	3.75 ± 0.22
NNW-10	4.25 ± 0.09	3.95 ± 0.12	SW-10	3.75 ± 0.13	3.49 ± 0.20
NW-5	3.48 ± 0.24	3.25 ± 0.28	SSW-2	3.43 ± 0.14	3.44 ± 0.47
NW-10	4.53 ± 0.44	4.47 ± 0.48	SSW-5	3.91 ± 0.45	3.83 ± 0.53
WNW-2	3.48 ± 0.42	3.29 ± 0.45	SSW-10	3.27 ± 0.35	3.05 ± 0.54
WNW-5	3.46 ± 0.25	3.41 ± 0.16	S-5	3.69 ± 0.37	3.39 ± 0.06
WNW-10	3.52 ± 0.03	3.36 ± 0.39	S-10	3.55 ± 0.67	3.41 ± 0.08
W-2	3.56 ± 0.16	3.41 ± 0.12	S/SSE-10	3.78 ± 0.36	3.42 ± 0.10
W-5	3.89 ± 0.24	3.83 ± 0.29	SSE-5	3.48 ± 0.37	3.13 ± 0.42
W-10	3.22 ± 0.18	3.09 ± 0.18	SSE-10	3.61 ± 0.23	3.62 ± 0.37
WSW-2	3.68 ± 0.29	3.41 ± 0.33	SE-1	3.50 ± 0.36	3.18 ± 0.08
WSW-5	3.72 ± 0.55	3.49 ± 0.48	H-32	3.76 ± 0.44	3.62 ± 0.36
WSW-10	3.23 ± 0.16	3.02 ± 0.30			

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

Collection Date	H08	H12	H14	H30	H34
02-Oct-18	<0.02	<0.02	<0.02	<0.02(A)	<0.02
09-Oct-18	<0.02	<0.02	<0.02	(B)	<0.02
16-Oct-18	<0.02	<0.02	<0.03	<0.04	<0.02
23-Oct-18	<0.02	<0.02	<0.03	<0.03	<0.02
30-Oct-18	<0.02	<0.02	<0.02	<0.02	<0.02
06-Nov-18	<0.03	<0.03	<0.03	<0.02	<0.03
13-Nov-18	<0.02	<0.02	<0.02	<0.02	<0.02
20-Nov-18	<0.02	<0.02	<0.02	<0.02	<0.02
27-Nov-18	<0.02	<0.02	<0.02	<0.02	<0.02
05-Dec-18	<0.01	<0.01	<0.01	<0.01	<0.02
11-Dec-18	<0.03	<0.03	<0.03	<0.03	<0.03
18-Dec-18	<0.02	<0.02	<0.02	<0.02	<0.02
26-Dec-18	<0.02	<0.02	<0.02	<0.02	<0.02

(A) No power but a near normal collection volume.
(B) Still no power; no sample collection. Power restored 11-Oct-18.

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

Collection Date	H08	H12	H14	H30	H34
02-Oct-18	0.014 ± 0.003	0.020 ± 0.003	0.016 ± 0.003	0.007 ± 0.002(A)	0.017 ± 0.003
09-Oct-18	0.022 ± 0.002	0.027 ± 0.003	0.026 ± 0.003	(B)	0.021 ± 0.002
16-Oct-18	0.010 ± 0.002	0.013 ± 0.002	0.014 ± 0.002	0.015 ± 0.003	0.016 ± 0.002
23-Oct-18	0.010 ± 0.002	0.013 ± 0.002	0.014 ± 0.002	0.015 ± 0.003	0.016 ± 0.002
30-Oct-18	0.023 ± 0.002	0.027 ± 0.003	0.025 ± 0.003	0.015 ± 0.002	0.023 ± 0.002
06-Nov-18	0.014 ± 0.002	0.015 ± 0.002	0.018 ± 0.002	0.012 ± 0.002	0.014 ± 0.002
13-Nov-18	0.005 ± 0.002	0.004 ± 0.002	0.004 ± 0.002	0.003 ± 0.001	0.007 ± 0.002
20-Nov-18	0.014 ± 0.002	0.015 ± 0.002	0.012 ± 0.002	0.009 ± 0.002	0.013 ± 0.002
27-Nov-18	0.015 ± 0.002	0.020 ± 0.002	0.017 ± 0.002	0.008 ± 0.002	0.017 ± 0.002
05-Dec-18	0.015 ± 0.002	0.015 ± 0.002	0.018 ± 0.002	0.012 ± 0.002	0.015 ± 0.002
11-Dec-18	0.007 ± 0.002	0.011 ± 0.002	0.012 ± 0.002	0.005 ± 0.002	0.009 ± 0.002
18-Dec-18	0.006 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.009 ± 0.002	0.011 ± 0.002
26-Dec-18	0.014 ± 0.002	0.012 ± 0.002	0.015 ± 0.002	0.009 ± 0.002	0.013 ± 0.002
Average:	0.013 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.010 ± 0.001	0.015 ± 0.001

(A) No power but a near normal collection volume.
(B) Still no power; no sample collection. Power restored 11-Oct-18.

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

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H08	0.1342 ± 0.0109	<0.0152	<0.0014	<0.0012	<0.0371
H12	0.1614 ± 0.0116	<0.0247	<0.0013	<0.0013	<0.0424
H14	0.1346 ± 0.0096	<0.0149	<0.0016	<0.0011	<0.0212
H30	0.1384 ± 0.0118	<0.0301	<0.0013	<0.0011	<0.0499
H34	0.1485 ± 0.0098	<0.0137	<0.0015	<0.0012	<0.0212

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	02-Oct-18	<144	382 ± 27	<3	<3	<7	<3	<8	<6	<5	<3	<4	<6
	09-Oct-18	<144	308 ± 24	<4	<3	<6	<3	<7	<5	<3	<3	<3	<9
	16-Oct-18	<153	382 ± 27	<3	<3	<7	<3	<8	<5	<4	<3	<3	<11
	23-Oct-18	<153	399 ± 27	<3	<3	<8	<4	<8	<6	<4	<3	<3	<6
	30-Oct-18	<144	335 ± 26	<3	<3	<8	<3	<9	<6	<3	<3	<4	<12
	06-Nov-18	<144	360 ± 26	<3	<3	<6	<4	<8	<5	<3	<3	<4	<10
	13-Nov-18	<133	429 ± 28	<3	<3	<8	<4	<8	<6	<4	<3	<3	<6
	20-Nov-18	<144	344 ± 26	<3	<3	<7	<3	<8	<6	<3	<3	<4	<11
	27-Nov-18	<143	368 ± 26	<3	<4	<9	<4	<8	<5	<4	<3	<4	<8
	05-Dec-18	<142	452 ± 40	<6	<7	<14	<7	<12	<11	<8	<6	<7	<10
	11-Dec-18	<142	376 ± 40	<6	<6	<15	<7	<15	<11	<9	<5	<6	<8
	18-Dec-18	<142	407 ± 28	<3	<4	<7	<4	<7	<6	<4	<3	<3	<8
	26-Dec-18	<143	386 ± 27	<3	<3	<6	<4	<7	<6	<4	<3	<3	<9
H59	11-Oct-18	<153	398 ± 38	<6	<5	<11	<7	<13	<10	<6	<5	<6	<17
	13-Nov-18	<133	374 ± 27	<3	<3	<8	<3	<8	<6	<2	<3	<3	<7
	11-Dec-18	<142	327 ± 25	<3	<3	<8	<4	<10	<6	<6	<3	<4	<4

(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)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	This sample was previously collected.											
H59	This sample was previously collected.											

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

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	24-Dec-18	1659 ± 166	<25	<27	<48	<27	<43	<22	<23	<425	<115
H59	27-Nov-18	1717 ± 140	<22	<22	<34	<16	<44	<20	<24	<458	<98

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

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	This sample was previously collected.										
H59	This sample was previously 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	Pb-212	Ra-226	Ra-228
H51	11-Oct-18	1255 ± 51	2586 ± 113	<9	<7	6 ± 2	300 ± 82	16 ± 3	<197	<33
	13-Nov-18	592 ± 54	4968 ± 223	<14	<12	<15	<1012	26 ± 8	<301	<69
	11-Dec-18	419 ± 55	5934 ± 254	<15	<13	<17	<1076	28 ± 9	<331	<70
H52	11-Oct-18	1039 ± 62	3547 ± 169	<12	<11	<13	<869	13 ± 6	<252	<58
	13-Nov-18	450 ± 31	3863 ± 150	<9	<8	<9	<339	30 ± 4	<194	<37
	11-Dec-18	2297 ± 79	4114 ± 161	<11	<9	<11	539 ± 97	<23	<236	<44
H59	11-Oct-18	1546 ± 56	3917 ± 147	<9	<7	<9	<346	20 ± 4	<179	<33
	13-Nov-18	689 ± 56	3157 ± 173	<15	<12	<16	<1139	31 ± 8	<310	<66
	11-Dec-18	714 ± 39	2691 ± 118	<9	<7	<10	235 ± 63	14 ± 4	<204	<37

ST. LUCIE SITE

Supplemental Sampling

Fourth Quarter, 2018

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	9	18
2. Airborne			
2.a. Air Iodines	Weekly	3	39
2.b. Air Particulates	Weekly	3	39
3. Waterborne			
3.a. Surface Water	Monthly	2	6
3.b. Shoreline Sediment	Semiannually	4	0
3.c. Beach Sand	Semiannually	3	0
3.d. Ground Water	Quarterly	10	10
4. Ingestion			
4.a. Garden Crops	Annually	1	0
4.b. Citrus	Annually	1	0
			Total: 112

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.

1. DIRECT RADIATION - TLD's - (µR/hour)

Sample Site	Deployment 11-Sep-18 Collection 05-Dec-18	
	Old	New
H08	4.06 ± 0.23	4.03 ± 0.05
H09	4.10 ± 0.11	3.86 ± 0.08
H12	8.05 ± 0.65	7.71 ± 1.10
H14	4.24 ± 0.24	4.10 ± 0.22
H33	3.92 ± 0.26	3.56 ± 0.19
H34	3.89 ± 0.26	3.67 ± 0.39
H60	3.76 ± 0.15	3.70 ± 0.20
H61	4.85 ± 0.34	5.08 ± 0.18
H62	4.35 ± 0.50	4.06 ± 0.27

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

Collection Date	H09	H32	H33
02-Oct-18	<0.02	<0.02	<0.02
09-Oct-18	<0.02	<0.02	<0.02
16-Oct-18	<0.02	<0.02	<0.02
23-Oct-18	<0.02	<0.02	<0.02
30-Oct-18	<0.02	<0.02	<0.02
06-Nov-18	<0.03	<0.03	<0.03
13-Nov-18	<0.02	<0.02	<0.02
20-Nov-18	<0.02	<0.02	<0.02
27-Nov-18	<0.02	<0.02	<0.02
05-Dec-18	<0.01	<0.02	<0.01
11-Dec-18	<0.03	<0.03	<0.03
18-Dec-18	<0.02	<0.02	<0.02
26-Dec-18	<0.02	<0.02	<0.02

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

Collection Date	H09	H32	H33
02-Oct-18	0.017 ± 0.003	0.016 ± 0.003	0.017 ± 0.003
09-Oct-18	0.018 ± 0.002	0.023 ± 0.002	0.021 ± 0.002
16-Oct-18	0.009 ± 0.002	0.013 ± 0.002	0.011 ± 0.002
23-Oct-18	0.016 ± 0.002	0.016 ± 0.002	0.011 ± 0.002
30-Oct-18	0.023 ± 0.002	0.025 ± 0.003	0.025 ± 0.002
06-Nov-18	0.016 ± 0.002	0.016 ± 0.002	0.014 ± 0.002
13-Nov-18	0.004 ± 0.002	0.007 ± 0.002	0.006 ± 0.002
20-Nov-18	0.014 ± 0.002	0.016 ± 0.002	0.009 ± 0.002
27-Nov-18	0.014 ± 0.002	0.018 ± 0.002	0.014 ± 0.002
05-Dec-18	0.020 ± 0.002	0.015 ± 0.002	0.019 ± 0.002
11-Dec-18	0.013 ± 0.002	0.015 ± 0.003	0.013 ± 0.003
18-Dec-18	0.008 ± 0.002	0.010 ± 0.002	0.009 ± 0.002
26-Dec-18	0.017 ± 0.002	0.017 ± 0.002	0.018 ± 0.002
Average:	0.015 ± 0.001	0.016 ± 0.001	0.014 ± 0.001

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

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H09	0.1726 ± 0.0106	<0.0137	<0.0015	<0.0013	0.0155 ± 0.0039
H32	0.1448 ± 0.0096	<0.0147	<0.0014	<0.0011	0.0283 ± 0.0050
H33	0.1490 ± 0.0114	<0.0268	<0.0014	<0.0013	<0.0418

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)
H13	11-Oct-18	<153	263 ± 23	<4	<3	<7	<3	<8	<5	<4	<3	<3	<12
	13-Nov-18	<133	320 ± 25	<3	<3	<8	<4	<7	<5	<4	<4	<3	<8
	11-Dec-18	<142	360 ± 26	<3	<3	<8	<4	<7	<6	<6	<3	<4	<5
H36	11-Oct-18	<153	311 ± 24	<3	<3	<6	<3	<7	<5	<4	<4	<3	<11
	13-Nov-18	<133	370 ± 26	<3	<4	<8	<3	<7	<6	<4	<3	<4	<6
	11-Dec-18	<142	432 ± 40	<6	<5	<13	<7	<12	<10	<10	<6	<6	<11

(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)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H13	This sample was previously collected.											
H16	This sample was previously collected.											
H19	This sample was previously collected.											
H36	This sample was previously collected.											

3.c. BEACH SAND - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	This sample was previously collected.											
H16	This sample was previously collected.											
H19	This sample was previously collected.											

3.d. GROUND 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)
H70	18-Oct-18	142 ± 27	<110	<6	<6	<10	<7	<12	<10	<8	<5	<6	<10
H71	18-Oct-18	332 ± 53	331 ± 26	<3	<4	<8	<4	<8	<6	<5	<4	<4	<5
H72	18-Oct-18	<144	383 ± 39	<6	<7	<13	<7	<15	<10	<9	<5	<7	<9
H73	18-Oct-18	<144	89 ± 14	<3	<3	<7	<3	<8	<6	<5	<4	<4	<5
H74	18-Oct-18	<153	346 ± 36	<5	<6	<12	<6	<16	<11	<9	<5	<7	<8
H75	18-Oct-18	<153	342 ± 36	<7	<7	<14	<5	<13	<9	<10	<5	<7	<10
H76	18-Oct-18	<144	<44	<3	<3	<7	<4	<8	<5	<6	<3	<3	<5
H77	18-Oct-18	<144	<79	<7	<6	<14	<6	<11	<12	<9	<5	<6	<10
H78	18-Oct-18	<144	53 ± 12	<3	<3	<7	<3	<8	<6	<6	<3	<4	<6
H79	18-Oct-18	<153	<100	<5	<6	<12	<6	<11	<10	<9	<6	<6	<10

(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.

4.a. GARDEN CROPS - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H41	This sample was previously collected.					

4.b. CITRUS - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H23	This sample was previously collected.					

DOE-MAPEP 38 RESULTS
ERA-RadCheM/MRaD Proficiency Test

Radionuclide	Result	Ref. Value	Flag (Evaluation)	Acceptance Range
Matrix: RdF Air Filter (Bq/filter)				
MN54	1.106	1.03	A	0.72-1.34
CO57	1.126	1.18	A	0.83-1.53
CO60	0.007		A	False Positive Test (within acceptance range)
ZN65	1.473	1.33	A	0.93-1.73
CS134	0.657	0.675	A	0.473-0.878
CS137	0.006		A	False Positive Test (within acceptance range)
Matrix: GrF Air Filter (Bq/filter) - *(No MAPEP Gross Beta, Unknown from ERA MRAD-258PT Program)*				
Gross Beta	50.8	52.0	A	31.5-78.6
Matrix: MaS Soil (Bq/kg)				
K40	578.43	577	A	404-750
MN54	1044.29	1010	A	707-1313
CO57	823.86	826	A	578-1074
CO60	548.57	560	A	392-728
ZN65	1025.71	960	A	672-1248
CS134	0.61		A	False Positive Test (within acceptance range)
CS137	4.73	4.6	A	Sensitivity Evaluation
Matrix: MaW Water (Bq/L)				
H3	-0.336	0	A	False Positive Test (within acceptance range)
MN54	0.005	0	A	False Positive Test (within acceptance range)
CO57	-0.011	0	A	False Positive Test (within acceptance range)
CO60	11.410	11.5	A	8.1-15.0
ZN65	15.360	14.3	A	10.0-18.6
CS134	9.478	10.2	A	7.1-13.3
CS137	12.450	12.2	A	8.5-15.9

Matrix: RdV Vegetation (Bq/sample)

MN54	2.578	2.66	A	1.86-3.46
CO57	4.459	4.42	A	3.09-5.75
CO60	2.138	2.29	A	1.60-2.98
ZN65	0.143	0	A	False Positive Test (within acceptance range)
CS134	2.998	3.23	A	2.26-4.20
CS137	3.616	3.67	A	2.57-4.77

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

In MAPEP 38, 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 are no relevant data flags.

2018
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
ST. LUCIE PLANT – UNITS 1 & 2

ATTACHMENT D

Industry Initiative

Ground Water Protection Program

Tritium in Ground Water Monitoring

2018

2018
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
ST. LUCIE PLANT – UNITS 1 & 2

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	S/W corner of Intake canal and the adjacent access road
H74	GIS-MW-SWI	S/W 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 2018 Tritium Results [(1)] Summary, pCi/L

Well number	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
H70	<161	<158	<143	142
H71	560	374	441	332
H72	<161	<158	<137	<144
H73	<161	<146	<143	<144
H74	<161	<158	<147	<153
H75	<161	<146	<147	<153
H76	<161	<159	<147	<144
H77	<159	<158	<147	<144
H78	<159	<158	<147	<144
H79	<159	<158	<147	<153

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 150 pCi/liter

Map depicting the well locations follows.

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

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS IN SUPPORT OF THE INDUSTRY INITIATIVE