

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

First Quarter, 1989

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

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TURKEY POINT SITE

Technical Specifications Sampling

First Quarter, 1989

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
3. Waterborne			
3.a Surface Water	Monthly	3	9
3.b Shoreline Sediment	Semiannually	3	3
4. Ingestion			
4.a Fish and Invertebrates			
4.a.1 Crustacea	Semiannually	2	2
4.a.2 Fish	Semiannually	2	2
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	9
			<hr/> Total: 201

* - Includes DOE split samples.

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

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

TURKEY POINT TECHNICAL SPECIFICATIONS SAMPLING

First Quarter, 1989

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

Each result is the average net response of two dosimeters.

<u>Sample Site</u>	<u>Deployment Collection</u>	<u>12-20-88 03-14-89</u>
N-1	5.3 ± 0.3	
N-5	6.2 ± 0.3	
N-10	5.8 ± 0.3	
NNW-1	6.2 ± 0.3	
NNW-10	6.4 ± 0.3	
NW/WNW-1	5.0 ± 0.3	
NW-5	5.6 ± 0.3	
NW-10	7.7 ± 0.4	
W/WNW-5	4.8 ± 0.3	
WNW-10	6.5 ± 0.3	
W-1	5.1 ± 0.3	
W-10	6.7 ± 0.4	
WSW-10	4.9 ± 0.3	
SW/SSW-1	4.8 ± 0.3	
SW-10	4.9 ± 0.3	
SSW/SW-5	5.8 ± 0.3	
SSW-10	5.9 ± 0.3	
S-5	5.3 ± 0.3	
S-10	6.3 ± 0.3	
SSE/S-1	5.4 ± 0.3	
SSE-10	5.1 ± 0.3	

Notes:

- (A) These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been completed.
- (B) Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.



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

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
01-03-89	<0.02	<0.02	<0.02	<0.02	<0.02
01-10-89	<0.04	<0.04	<0.04	<0.03	<0.04
01-17-89	<0.02	<0.02	<0.02	<0.02	<0.02
01-24-89	<0.02	<0.02	<0.02	<0.02	<0.02
01-31-89	<0.03	<0.03	<0.03	<0.03	<0.03
02-07-89	<0.03	<0.03	<0.03	<0.03	<0.03
02-14-89	<0.02	<0.03	<0.02	<0.02	<0.02
02-21-89	<0.03	<0.03	<0.03	<0.03	<0.03
02-28-89	<0.02	<0.02	<0.02	<0.02	<0.02
03-07-89	<0.02	<0.02	<0.02	<0.02	<0.02
03-14-89	<0.02	<0.02	<0.02	<0.02	<0.02
03-21-89	<0.03	<0.03	<0.03	<0.03	<0.03
03-28-89	<0.02	<0.02	<0.02	<0.02	<0.02

2.b

AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
01-03-89	0.008 ± 0.002	0.006 ± 0.002	0.010 ± 0.002	0.007 ± 0.002	0.012 ± 0.002
01-10-89	0.010 ± 0.002	0.006 ± 0.002	0.011 ± 0.002	0.008 ± 0.002	0.011 ± 0.002
01-17-89	<0.005	<0.005	<0.005	0.003 ± 0.001	0.004 ± 0.002
01-24-89	0.006 ± 0.002	0.007 ± 0.002	0.007 ± 0.002	<0.005	0.005 ± 0.002
01-31-89	0.007 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.005 ± 0.002	0.005 ± 0.001
02-07-89	0.007 ± 0.002	<0.004	*0.005 ± 0.002	0.003 ± 0.001	0.003 ± 0.001
02-14-89	0.013 ± 0.002	0.018 ± 0.002	*0.014 ± 0.002	0.014 ± 0.002	0.015 ± 0.002
02-21-89	0.009 ± 0.002	0.009 ± 0.002	*0.007 ± 0.002	0.006 ± 0.002	0.008 ± 0.002
02-28-89	0.013 ± 0.002	0.011 ± 0.002	*0.012 ± 0.002	0.010 ± 0.002	0.015 ± 0.002
03-07-89	0.005 ± 0.001	0.005 ± 0.002	<0.005	0.004 ± 0.001	0.004 ± 0.001
03-14-89	0.009 ± 0.002	0.014 ± 0.002	0.011 ± 0.002	0.013 ± 0.002	0.013 ± 0.002
03-21-89	0.014 ± 0.002	0.013 ± 0.002	0.011 ± 0.002	0.014 ± 0.002	0.012 ± 0.002
03-28-89	0.006 ± 0.002	0.005 ± 0.002	0.004 ± 0.001	0.006 ± 0.002	0.003 ± 0.001
Means:	0.009 ± 0.001	0.009 ± 0.001	0.009 ± 0.001	0.008 ± 0.001	0.008 ± 0.001

* - DOE split samples.

2.b

AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m³)

First Quarter, 1989

Sample Site	Be-7	K-40	Cs-134	Cs-137
T51	0.134 ± 0.009	<0.013	<0.0007	<0.0006
T57	0.107 ± 0.007	<0.013	<0.0010	<0.0006
T58	0.120 ± 0.008	<0.013	<0.0008	<0.0008
T64	0.116 ± 0.009	<0.024	<0.0008	<0.0006
T72	0.128 ± 0.009	<0.015	<0.0008	<0.0008

3.a

SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	01-18-89	<150	280 ± 50	<4	<9	<4	<5	<11	<8	<6	<5	<4	<6
	02-13-89	<130	310 ± 50	<4	<8	<4	<6	<8	<6	<8	<5	<4	<5
	03-10-89	<130	360 ± 50	<4	<8	<3	<5	<10	<9	<9	<5	<4	<6
T67	01-18-89	<150	330 ± 50	<4	<9	<5	<5	<11	<8	<7	<4	<4	<6
	02-13-89	<130	230 ± 40	<3	<9	<5	<5	<12	<8	<10	<4	<4	<7
	03-10-89	<130	300 ± 50	<4	<9	<5	<5	<8	<5	<10	<4	<4	<8
T81	01-18-89	500 ± 50	360 ± 50	<5	<9	<4	<4	<9	<8	<7	<5	<5	<5
	02-13-89	240 ± 50	350 ± 50	<4	<8	<5	<5	<10	<8	<10	<5	<4	<5
	03-10-89	120 ± 40	230 ± 50	<4	<12	<4	<5	<11	<6	<9	<5	<5	<9

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

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



3.b 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>Ra-226</u>	<u>Th-232</u>
T42	01-13-89	140 ± 40	360 ± 70	<12	<12	<13	<13	781 ± 16	<75
T67	01-18-89	<130	1630 ± 90	<6	<10	<10	<8	204 ± 8	<52
T81	01-13-89	370 ± 70	550 ± 90	<15	<15	<14	<13	812 ± 42	<70

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>Fe-59</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>
T67	02-23-89	2220 ± 180	<17	<33	<15	<17	<41	<20	<16	99 ± 13
T81	02-14-89	2090 ± 160	<14	<39	<14	<16	<35	<17	<16	315 ± 15

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>Fe-59</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>
T67	03-02-89	1850 ± 120	<11	<29	<11	<11	<24	<12	<11	<24
T81	01-13-89	2340 ± 170	<15	<46	<17	<16	<35	<14	<17	129 ± 10

4.b.1 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>Ra-226</u>
T40	01-18-89	920 ± 70	5050 ± 200	<11	<14	46 ± 7	38 ± 12
	02-13-89	660 ± 70	4780 ± 190	<20	<12	89 ± 8	60 ± 10
	03-10-89	1140 ± 80	4750 ± 200	<29	<15	44 ± 7	66 ± 10
T41	01-18-89	760 ± 60	4860 ± 210	<13	<12	93 ± 8	<31
	02-13-89	590 ± 70	4980 ± 210	<22	<14	176 ± 11	<31
	03-10-89	780 ± 70	3840 ± 170	<27	<13	169 ± 11	<27
T67	01-18-89	610 ± 60	3080 ± 170	<14	<11	84 ± 7	25 ± 9
	02-13-89	550 ± 70	4660 ± 200	<20	<15	<12	<69
	03-10-89	940 ± 70	3780 ± 170	<24	<12	<11	<30

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

Second Quarter, 1989

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services



TURKEY POINT SITE

Technical Specifications Sampling

Second Quarter, 1989

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
3. Waterborne			
3.a Surface Water	Monthly	3	9
3.b Shoreline Sediment	Semiannually	0	0
4. Ingestion			
4.a Fish and Invertebrates			
4.a.1 Crustacea	Semiannually	0	0
4.a.2 Fish	Semiannually	0	0
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	10*
			<hr/> Total: 195

* - Includes NRC split samples.

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

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



TURKEY POINT TECHNICAL SPECIFICATIONS SAMPLING

Second Quarter, 1989

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

Each result is the average net response of two dosimeters.

Sample Site	Deployment Collection	03-14-89 06-20-89
N-1	5.2 ± 0.3	
N-5	5.6 ± 0.3	
N-10	5.3 ± 0.3	
NNW-1	5.7 ± 0.3	
NNW-10	6.0 ± 0.3	
NW/WNW-1	5.0 ± 0.3	
NW-5	5.3 ± 0.3	
NW-10	7.6 ± 0.4	
W/WNW-5	5.0 ± 0.3	
WNW-10	6.5 ± 0.3	
W-1	5.3 ± 0.3	
W-10	6.7 ± 0.4	
WSW-10	4.9 ± 0.3	
SW/SSW-1	4.7 ± 0.2	
SW-10	4.8 ± 0.3	
SSW/SW-5	5.6 ± 0.3	
SSW-10	5.6 ± 0.3	
S-5	4.8 ± 0.3	
S-10	5.4 ± 0.3	
SSE/S-1	4.8 ± 0.2	
SSE-10	4.7 ± 0.2	

Notes:

- (A) These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been completed.
- (B) Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.



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

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
04-05-89	<0.02	<0.02	<0.02	<0.03	<0.02
04-11-89	<0.03	<0.03	<0.03	<0.03	<0.03
04-18-89	<0.02	<0.02	<0.02	<0.02	<0.02
04-24-89	<0.03	<0.03	<0.03	<0.03	<0.03
05-02-89	<0.02	<0.03	<0.02	<0.02	<0.02
05-09-89	<0.03	<0.03	<0.03	<0.03	<0.03
05-16-89	<0.02	<0.02	<0.02	<0.02	<0.02
05-23-89	<0.03	<0.03	<0.03	<0.03	<0.03
05-30-89	<0.03	<0.03	<0.03	<0.03	<0.03
06-06-89	<0.03	<0.03	<0.03	<0.03	<0.03
06-13-89	<0.02	<0.02	<0.02	<0.02	<0.02
06-20-89	<0.03	<0.03	<0.02	<0.02	<0.03
06-27-89	<0.02	<0.02	<0.02	<0.02	<0.02

2.b

AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
04-05-89	0.010 ± 0.002	0.006 ± 0.001	0.007 ± 0.001	0.008 ± 0.001	0.006 ± 0.001
04-11-89	0.012 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.012 ± 0.002
04-18-89	0.006 ± 0.002	0.007 ± 0.002	0.005 ± 0.001	0.008 ± 0.002	0.005 ± 0.001
04-24-89	0.011 ± 0.002	0.015 ± 0.002	0.013 ± 0.002	0.008 ± 0.002	0.010 ± 0.002
05-02-89	0.014 ± 0.002	0.015 ± 0.002	*0.014 ± 0.002	0.017 ± 0.002	0.015 ± 0.002
05-09-89	0.016 ± 0.002	0.012 ± 0.002	*0.015 ± 0.002	0.012 ± 0.002	0.015 ± 0.002
05-16-89	0.014 ± 0.002	0.015 ± 0.002	*0.013 ± 0.002	0.014 ± 0.002	0.015 ± 0.002
05-23-89	0.017 ± 0.002	0.016 ± 0.002	*0.011 ± 0.002	0.014 ± 0.002	0.015 ± 0.002
05-30-89	0.018 ± 0.002	0.020 ± 0.002	0.016 ± 0.002	0.019 ± 0.002	0.020 ± 0.002
06-06-89	0.010 ± 0.002	0.010 ± 0.002	(A)0.009 ± 0.002	0.013 ± 0.002	0.010 ± 0.002
06-13-89	0.018 ± 0.002	0.019 ± 0.002	(A)0.012 ± 0.002	0.019 ± 0.002	0.014 ± 0.002
06-20-89	0.011 ± 0.002	0.012 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.014 ± 0.002
06-27-89	0.009 ± 0.002	0.011 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.011 ± 0.002
Means:	0.013 ± 0.001	0.013 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.012 ± 0.001

* - NRC split samples.

(A) - Upon collection of these samples, the particulate filters were found to be partially covered by mud dauber wasp nests. The effect, if any, of the nests on these samples is not known.

2.b

AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m³)

Second Quarter, 1989

Sample Site	Be-7	K-40	Cs-134	Cs-137
T51	0.119 ± 0.009	<0.014	<0.0007	<0.0007
T57	0.127 ± 0.009	<0.014	<0.0008	<0.0007
T58	0.116 ± 0.009	<0.017	<0.0008	<0.0006
T64	0.112 ± 0.008	<0.014	<0.0008	<0.0007
T72	0.116 ± 0.009	<0.013	<0.0008	<0.0006

3.a

SURFACE WATER - (pCi/l)

Sample Site.	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	04-10-89	<140	330 ± 50	<4	<11	<4	<4	<9	<7	<6	<5	<3	<6
	05-15-89	<120	420 ± 50	<4	<10	<4	<5	<10	<8	<7	<6	<4	<7
	06-12-89	<130	370 ± 40	<4	<11	<4	<5	<11	<8	<8	<5	<5	<6
T67	04-10-89	<140	320 ± 50	<5	<9	<4	<5	<10	<9	<6	<5	<4	<7
	05-16-89	90 ± 40	210 ± 40	<4	<11	<4	<3	<9	<6	<7	<5	<4	<6
	06-12-89	<130	320 ± 40	<4	<11	<5	<5	<7	<9	<9	<3	<4	<5
T81	04-10-89	830 ± 60	310 ± 50	<4	<10	<3	<5	<10	<7	<7	<4	<5	<7
	05-15-89	230 ± 40	360 ± 40	<4	<10	<4	<4	<12	<6	<8	<4	<5	<4
	06-12-89	420 ± 50	390 ± 40	<5	<11	<4	<5	<8	<8	<9	<4	<4	<10

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

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

4.b.1 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>
T40	04-10-89	760 ± 60	3900 ± 180	<12	<10	20 ± 6
	05-15-89*	650 ± 60	4420 ± 180	<18	<13	33 ± 7
	06-12-89	1020 ± 70	4080 ± 180	<20	<13	81 ± 8
T41	04-10-89	660 ± 70	3350 ± 180	<15	<13	164 ± 12
	05-15-89	520 ± 60	2680 ± 140	<19	<12	202 ± 11
	06-12-89	580 ± 60	2600 ± 140	<19	<12	195 ± 11
T67	04-10-89(A)	370 ± 50	2240 ± 150	<13	<10	<10
	05-16-89	530 ± 60	2740 ± 150	<18	<13	207 ± 11
	06-12-89	1070 ± 80	3420 ± 160	<19	<11	58 ± 8

* - NRC split sample.

A - Mangrove leaves were substituted for brazilian pepper for this sample.



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Third Quarter, 1989

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Technical Specifications Sampling

Third Quarter, 1989

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2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
3. Waterborne			
3.a Surface Water	Monthly	3	9
3.b Shoreline Sediment	Semiannually	3	3
4. Ingestion			
4.a Fish and Invertebrates			
4.a.1 Crustacea	Semiannually	2	2
4.a.2 Fish	Semiannually	2	2
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	9
			Total: 201

* - Includes NRC split samples.

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

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Third Quarter, 1989

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

Each result is the average net response of two dosimeters.

<u>Sample Site</u>	<u>Deployment Collection</u>	<u>06-20-89</u> <u>09-19-89</u>
N-1	5.5 ± 0.3	
N-5	6.0 ± 0.3	
N-10	5.7 ± 0.3	
NNW-1	6.2 ± 0.3	
NNW-10	6.2 ± 0.3	
NW/WW-1	4.9 ± 0.3	
NW-5	5.6 ± 0.3	
NW-10	7.7 ± 0.4	
W/WW-5	5.0 ± 0.3	
WW-10	6.6 ± 0.3	
W-1	5.5 ± 0.3	
W-10	6.8 ± 0.4	
WSW-10	5.0 ± 0.3	
SW/SSW-1	4.8 ± 0.3	
SW-10	4.9 ± 0.3	
SSW/SW-5	6.1 ± 0.3	
SSW-10	6.0 ± 0.3	
S-5	5.2 ± 0.3	
S-10	6.0 ± 0.3	
SSE/S-1	5.2 ± 0.3	
SSE-10	4.9 ± 0.3	

Notes:

- (A) These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been completed.
- (B) Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.

2.a

IODINE-131 IN WEEKLY AIR FILTERS - (pCi/m³)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
07-03-89	<0.03	<0.03	<0.03	<0.03	<0.03
07-11-89	<0.02	<0.02	<0.02	<0.02	<0.02
07-18-89	<0.02	<0.02	<0.02	<0.02	<0.02
07-25-89	<0.02	<0.02	<0.02	<0.02	<0.02
08-01-89	<0.03	<0.03	<0.03	<0.03	<0.03
08-08-89	<0.02(A)	<0.02	<0.02	<0.02	<0.02
08-15-89	<0.02	<0.02	<0.02	<0.02	<0.02
08-22-89	<0.03	<0.03	<0.03	<0.03	<0.03
08-29-89	<0.03	<0.03	<0.03	<0.03	<0.03
09-05-89	<0.02	<0.02	<0.02	<0.02	<0.02
09-12-89	<0.03	<0.03	<0.03	<0.03	<0.03
09-19-89	<0.02	<0.02	<0.02	<0.02	<0.02
09-26-89	<0.02	<0.02	<0.02	<0.02	<0.02

(A) - The masking tape used to seal the iodine filter cartridge holder was not in place during collection of this sample. This does not appear to have affected these results.



2.b

AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
07-03-89	0.010 ± 0.002	0.014 ± 0.002	0.008 ± 0.002	0.009 ± 0.002	0.013 ± 0.002
07-11-89	0.012 ± 0.002	0.005 ± 0.001	0.005 ± 0.001	0.005 ± 0.001	0.006 ± 0.001
07-18-89	0.008 ± 0.002	0.007 ± 0.002	0.006 ± 0.002	0.011 ± 0.002	0.007 ± 0.002
07-25-89	0.008 ± 0.002	<0.005	0.005 ± 0.001	0.004 ± 0.002	0.004 ± 0.002
08-01-89	0.008 ± 0.002	0.009 ± 0.002	*0.010 ± 0.002	0.008 ± 0.002	0.010 ± 0.002
08-08-89	(A)0.018 ± 0.002	0.011 ± 0.002	*0.014 ± 0.002	0.016 ± 0.002	0.016 ± 0.002
08-15-89	0.007 ± 0.002	0.005 ± 0.002	*0.007 ± 0.002	0.008 ± 0.002	0.007 ± 0.002
08-22-89	0.003 ± 0.001	0.005 ± 0.002	*0.008 ± 0.002	0.004 ± 0.001	0.005 ± 0.001
08-29-89	0.008 ± 0.002	0.007 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.009 ± 0.002
09-05-89	0.009 ± 0.002	0.006 ± 0.002	0.004 ± 0.001	0.006 ± 0.002	0.007 ± 0.002
09-12-89	0.010 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.013 ± 0.002	0.011 ± 0.002
09-19-89	0.006 ± 0.001	0.007 ± 0.002	0.005 ± 0.001	(B)0.004 ± 0.001	0.007 ± 0.002
09-26-89	0.007 ± 0.002	0.008 ± 0.002	0.005 ± 0.002	0.006 ± 0.002	0.004 ± 0.001
Means:	0.009 ± 0.001	0.007 ± 0.001	0.007 ± 0.001	0.008 ± 0.001	0.008 ± 0.001

* - NRC split samples.

(A) - The masking tape used to seal the iodine filter cartridge holder was not in place during collection of this sample. This does not appear to have affected these results.

(B) - The surface of this particulate filter was found to have been damaged. It is suspected that a curious passer-by had tampered with it.

2.b

AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m³)

Third Quarter, 1989

Sample Site	Be-7	K-40	Cs-134	Cs-137
T51	0.086 ± 0.008	<0.017	<0.0007	<0.0005
T57	0.075 ± 0.007	<0.013	<0.0006	<0.0007
T58	0.073 ± 0.007	<0.013	<0.0008	<0.0007
T64	0.078 ± 0.007	<0.013	<0.0008	<0.0006
T72	0.087 ± 0.007	<0.016	<0.0007	<0.0006

3.a

SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	07-17-89	<130	350 ± 40	<4	<11	<4	<6	<9	<7	<5	<5	<4	<8
	08-14-89	<130	370 ± 40	<4	<9	<4	<3	<10	<7	<4	<4	<4	<3
	09-11-89	<140	330 ± 30	<4	<9	<4	<4	<9	<7	<9	<3	<4	<6
T67	07-17-89	<130	290 ± 40	<4	<10	<4	<4	<10	<8	<7	<5	<4	<6
	08-14-89	<130	360 ± 40	<3	<10	<4	<5	<6	<9	<5	<3	<4	<6
	09-11-89	<140	340 ± 40	<4	<9	<4	<5	<12	<9	<8	<4	<3	<6
T81	07-17-89	850 ± 60	360 ± 40	<4	<10	<4	<6	<10	<7	<6	<5	<4	<5
	08-14-89	360 ± 50	400 ± 40	<4	<9	<4	<5	<11	<7	<4	<4	<4	<5
	09-11-89	130 ± 40	390 ± 40	<3	<12	<5	<4	<9	<6	<10	<5	<4	<8

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

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



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

<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>Ra-226</u>	<u>Th-232</u>
T42	07-12-89	220 ± 60	940 ± 100	<10	<15	<14	<16	645 ± 21	<75
T67	07-12-89	840 ± 100	2610 ± 180	<19	<24	<18	55 ± 8	<330	<100
T81	07-12-89	<80	400 ± 40	<6	<8	<9	<7	240 ± 9	56 ± 20

4.a.1 CRUSTACEA - (T67: Blue Crab) (T81: Lobster) - (pCi/kg, wet weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Fe-59</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>
T67	08-09-89	1660 ± 110	<8	<23	<10	<11	<28	<9	<9	94 ± 8
T81	07-25-89	2370 ± 130	<9	<36	<13	<12	<28	<12	<11	235 ± 11

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>Fe-59</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>
T67	08-09-89	2580 ± 130	<8	<26	<10	<11	<21	<8	<11	<65
T81	07-28-89	2580 ± 140	<8	<34	<9	<9	<29	<9	<11	<91

4.b.1 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>Ra-226</u>
T40	07-17-89	1240 ± 80	3580 ± 160	<12	<11	16 ± 6	<47
	08-14-89	2180 ± 80	3690 ± 150	<10	<8	74 ± 7	21 ± 7
	09-11-89	1850 ± 80	4310 ± 170	<20	<10	39 ± 7	<34
T41	07-17-89	1370 ± 90	3640 ± 170	<16	<14	192 ± 12	<45
	08-14-89	1340 ± 70	2870 ± 140	<12	<10	214 ± 10	<37
	09-11-89	1540 ± 80	3880 ± 160	<20	<12	129 ± 8	<21
T67	07-17-89	1090 ± 70	2380 ± 130	<11	<11	72 ± 7	<32
	08-14-89	1480 ± 80	3780 ± 170	<12	<12	57 ± 6	<63
	09-11-89	1440 ± 90	2970 ± 150	<21	<11	115 ± 9	<54



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

Fourth Quarter, 1989

Office of Radiation Control
Florida Department of Health
and Rehabilitative Services



TURKEY POINT SITE

Technical Specifications Sampling

Fourth Quarter, 1989

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
3. Waterborne			
3.a Surface Water	Monthly	3	9
3.b Shoreline Sediment	Semiannually	0	0
4. Ingestion			
4.a Fish and Invertebrates			
4.a.1 Crustacea	Semiannually	0	0
4.a.2 Fish	Semiannually	0	0
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	10*
			Total: 195

* - Includes NRC split samples.

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

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

TURKEY POINT TECHNICAL SPECIFICATIONS SAMPLING

Fourth Quarter, 1989

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

Each result is the average net response of two dosimeters.

<u>Sample Site</u>	<u>Deployment Collection</u>	<u>09-19-89 12-19-89</u>
N-1	5.3 ± 0.3	
N-5	5.6 ± 0.3	
N-10	5.6 ± 0.3	
NNW-1	5.9 ± 0.3	
NNW-10	6.2 ± 0.3	
NW/WNW-1	5.1 ± 0.3	
NW-5	5.3 ± 0.3	
NW-10	7.5 ± 0.4	
W/WNW-5	4.9 ± 0.3	
WNW-10	6.3 ± 0.3	
W-1	5.2 ± 0.3	
W-10	6.7 ± 0.4	
WSW-10	4.9 ± 0.3	
SW/SSW-1	4.7 ± 0.2	
SW-10	4.9 ± 0.3	
SSW/SW-5	5.7 ± 0.3	
SSW-10	5.8 ± 0.3	
S-5	5.0 ± 0.3	
S-10	5.6 ± 0.3	
SSE/S-1	4.9 ± 0.3	
SSE-10	4.9 ± 0.3	

Notes:

- (A) These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been completed.
- (B) Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.



2.a

IODINE-131 IN WEEKLY AIR FILTERS - (pCi/m³)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
10-03-89	<0.02	<0.02	<0.02	<0.02	<0.02
10-11-89	<0.02	<0.02	<0.02	<0.02	<0.02
10-17-89	<0.02	<0.02	<0.02	<0.02	<0.02
10-24-89	<0.02	<0.02	<0.02	<0.02	<0.02
10-31-89	<0.03	<0.03	<0.03	<0.03	<0.03
11-06-89	<0.03	<0.03	<0.03	<0.03	<0.03
11-13-89	<0.02	<0.02	<0.02	<0.02	<0.02
11-21-89	<0.02	<0.02	<0.02	<0.02	<0.02
11-27-89	<0.02	<0.02	<0.02	<0.02	<0.02
12-06-89	<0.02	<0.02	<0.02	<0.02	<0.02
12-12-89	<0.02	<0.02	<0.02	<0.02	<0.02
12-19-89	<0.03	<0.03	<0.03	<0.03	<0.03
12-26-89	<0.02	<0.02	<0.02	<0.02	<0.02



2.b

AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
10-03-89	0.005 ± 0.002	<0.005	0.005 ± 0.002	0.005 ± 0.002	0.008 ± 0.002
10-11-89	0.007 ± 0.001	0.007 ± 0.001	0.010 ± 0.002	0.008 ± 0.001	0.010 ± 0.002
10-17-89	0.007 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.005 ± 0.002	0.006 ± 0.002
10-24-89	0.012 ± 0.002	0.011 ± 0.002	0.011 ± 0.002	0.014 ± 0.002	0.015 ± 0.002
10-31-89	0.011 ± 0.002	0.006 ± 0.001	*0.007 ± 0.002	0.007 ± 0.002	0.010 ± 0.002
11-06-89	0.008 ± 0.002	0.008 ± 0.002	*0.009 ± 0.002	0.007 ± 0.002	0.010 ± 0.002
11-13-89	0.012 ± 0.002	0.012 ± 0.002	*0.010 ± 0.002	0.008 ± 0.002	0.008 ± 0.002
11-21-89	0.017 ± 0.002	0.017 ± 0.002	*0.017 ± 0.002	0.016 ± 0.002	0.014 ± 0.002
11-27-89	0.012 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.013 ± 0.002	0.009 ± 0.002
12-06-89	0.011 ± 0.002	0.011 ± 0.002	0.008 ± 0.001	0.011 ± 0.002	0.011 ± 0.002
12-12-89	0.011 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.012 ± 0.002
12-19-89	0.016 ± 0.002	0.013 ± 0.002	0.010 ± 0.002	0.013 ± 0.002	0.018 ± 0.002
12-26-89	0.013 ± 0.002	0.014 ± 0.002	0.018 ± 0.002	0.016 ± 0.002	0.012 ± 0.002
Means:	0.011 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.011 ± 0.001

* - NRC split samples.

2.b

AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m³)

Fourth Quarter, 1989

Sample Site	Be-7	K-40	Cs-134	Cs-137
T51	0.107 ± 0.008	<0.017	<0.0007	<0.0004
T57	0.087 ± 0.008	<0.013	<0.0007	<0.0007
T58	0.104 ± 0.008	<0.013	<0.0008	<0.0006
T64	0.102 ± 0.008	<0.013	<0.0006	<0.0006
T72	0.084 ± 0.008	0.011 ± 0.004	<0.0007	<0.0005



3.a

SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	10-16-89	<130	390 ± 50	<4	<9	<4	<5	<7	<8	<6	<4	<4	<5
	11-22-89	<130	290 ± 40	<3	<10	<4	<3	<9	<6	<8	<5	<4	<7
	12-12-89	<130	320 ± 50	<3	<10	<5	<5	<8	<6	<5	<5	<4	<7
T67	10-16-89	<130	310 ± 30	<4	<10	<4	<6	<10	<8	<7	<5	<4	<7
	11-22-89	<120	320 ± 40	<4	<10	<4	<3	<11	<9	<8	<4	<4	<5
	12-12-89	<130	240 ± 30	<4	<8	<3	<5	<8	<8	<5	<4	<4	<4
T81	10-16-89	200 ± 50	370 ± 40	<3	<10	<4	<5	<8	<8	<7	<4	<5	<7
	11-22-89	90 ± 40	370 ± 40	<4	<11	<4	<4	<9	<6	<6	<4	<4	<4
	12-11-89	100 ± 40	380 ± 40	<4	<11	<4	<5	<9	<6	<5	<5	<4	<4

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

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

4.b.1 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>
T40	10-16-89	1550 ± 70	3860 ± 160	<11	<9	30 ± 6
	*11-22-89	260 ± 40	3440 ± 120	<14	<8	22 ± 4
	12-12-89	590 ± 60	5140 ± 190	<12	<12	39 ± 5
T41	10-16-89	1380 ± 70	3870 ± 160	<12	<11	119 ± 9
	11-22-89	700 ± 80	2530 ± 140	<24	<11	280 ± 13
	12-12-89	690 ± 80	3640 ± 160	<14	<10	320 ± 13
T67	10-16-89	810 ± 60	2400 ± 130	<10	<12	47 ± 7
	11-22-89	470 ± 70	4550 ± 190	<20	<10	84 ± 8
	12-12-89	530 ± 50	3800 ± 170	<11	<14	<12

* - NRC split sample.



1989
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT - UNITS NOS. 3 AND 4

ATTACHMENT C

RESULTS FROM THE
INTERLABORATORY COMPARISON PROGRAM
1989



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

January through June, 1989

Media	Nuclide	Collection	EPA	Units	Normal.	Mean of	N.D.K.	Action
		Mon Day Yr	Known		Range	Analyses		Level
FILTER	Alpha	03 31 89	21	pCi/F	0.118	23.67	0.92	
FILTER	Beta	03 31 89	62	pCi/F	0.237	59.00	-1.04	
FILTER	Cs-137	03 31 89	20	pCi/F	0.118	22.33	0.81	
FILTER	Sr-90	03 31 89	20	pCi/F	0.790	17.00	-3.46	1
MILK	Cs-137	04 28 89	50	pCi/L	0.237	50.00	0.00	
MILK	K	04 28 89	1600	mg/L	0.074	1613.33	0.29	
MILK	Sr-89	04 28 89	39	pCi/L	0.000	33.00	-2.08	
MILK	Sr-90	04 28 89	55	pCi/L	0.395	48.00	-4.04	2
WATER	Alpha	01 20 89	8	pCi/L	0.000	7.00	-0.35	
WATER	Alpha	05 12 89	30	pCi/L	0.222	26.67	-0.72	
WATER	Beta	01 20 89	4	pCi/L	0.118	5.33	0.46	
WATER	Beta	05 12 89	50	pCi/L	0.711	49.67	-0.12	
WATER	Cr-51	02 10 89	235	pCi/L	0.025	236.33	0.10	
WATER	Co-60	02 10 89	10	pCi/L	0.118	10.67	0.23	
WATER	Co-60	06 09 89	31	pCi/L	0.237	31.67	0.23	
WATER	Zn-65	02 10 89	159	pCi/L	0.111	167.33	0.90	
WATER	Zn-65	06 09 89	165	pCi/L	0.070	176.00	1.12	
WATER	Ru-106	02 10 89	178	pCi/L	0.165	173.00	-0.48	
WATER	Ru-106	06 09 89	128	pCi/L	0.775	127.00	-0.13	
WATER	Ba-133	06 09 89	49	pCi/L	0.000	48.00	-0.35	
WATER	Cs-134	02 10 89	10	pCi/L	0.000	10.00	0.00	
WATER	Cs-134	06 09 89	39	pCi/L	0.000	38.00	-0.35	
WATER	Cs-137	02 10 89	10	pCi/L	0.118	10.33	0.12	
WATER	Cs-137	06 09 89	20	pCi/L	0.000	21.00	0.35	
WATER	H-3	02 24 89	2754	pCi/L	0.000	2960.00	1.00	
WATER	H-3	06 23 89	4503	pCi/L	0.039	4736.67	0.90	
WATER	I-131	02 17 89	106	pCi/L	0.162	106.00	0.00	
WATER	Sr-89	01 06 89	40	pCi/L	0.474	35.00	-1.73	
WATER	Sr-89	05 05 89	6	pCi/L	0.237	5.00	-0.35	
WATER	Sr-90	01 06 89	25	pCi/L	0.395	22.67	-2.69	
WATER	Sr-90	05 05 89	6	pCi/L	0.395	4.67	-1.54	

NOTES:

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

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

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

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

ACTION LEVEL:

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

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

July through December, 1989

Media	Nuclide	Collection	EPA	Units	Normal.	Mean of	N.D.K.	Action
		Mon Day Yr	Known		Range	Analyses		Level
FILTER	Alpha	08 25 89	6	pCi/F	0.118	6.33	0.12	
FILTER	Beta	08 25 89		pCi/F			NA	
FILTER	Cs-137	08 25 89	10	pCi/F	0.118	10.67	0.23	
FILTER	I-131	08 25 89		pCi/F			NA	
WATER	Alpha	09 22 89	4	pCi/L	0.118	4.67	0.23	
WATER	Beta	09 22 89	6	pCi/L	0.000	12.00	2.08	
WATER	Co-60	10 06 89	30	pCi/L	0.118	32.33	0.81	
WATER	Zn-65	10 06 89	129	pCi/L	0.273	132.67	0.49	
WATER	Ru-106	10 06 89	161	pCi/L	0.370	163.00	0.22	
WATER	Ba-133	10 06 89	59	pCi/L	0.197	58.00	-0.29	
WATER	Cs-134	10 06 89	29	pCi/L	0.237	28.67	-0.12	
WATER	Cs-137	10 06 89	59	pCi/L	0.237	63.33	1.50	
WATER	H-3	10 20 89	3496	pCi/L	0.212	3563.33	0.32	
WATER	I-131	08 04 89	83	pCi/L	0.222	83.67	0.14	

NOTES:

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

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

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

NA: Not available. Due to problems in preparing cross-check sample. Please see attachments.

EMSL-LV AIR FILTER INTERCOMPARISON STUDY

August 25, 1989

Beta

Due to problems with the Iodine-131 in the Air Filter Intercomparison Study of August 25, 1989, the Beta results are invalid.

Study: 8908 AF

Isotope: Beta

Collection Date: August 25, 1989

Supervisory Check

Frank Morrelli

Date

Nov 29, 1989



EMSL-LV AIR FILTER INTERCOMPARISON STUDY

August 25, 1989

Iodine-131

Due to problems with the Iodine-131 in the Air Filter Intercomparison Study of August 25, 1989, the Iodine-131 results are invalid.

Study: 8908 AF

Isotope: Iodine-131

Collection Date: August 25, 1989

Supervisory Check

Frank Howell

Date

Nov. 29, 1989

