

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

TURKEY POINT UNITS 3 & 4

DOCKET NO. 50-250, 251

DADE COUNTY, FLORIDA

7-1-80 TO 12-31-80

81081107/9

TURKEY POINT: Units 3 & 4

Environmental Radiological Monitoring

(7-01-80 to 12-31-80)

1. Introduction

This report is submitted in accordance with Turkey Point Plant Technical Specifications.

Environmental samples were collected and analyzed in conformance with the requirements of the Technical Specifications. The minimum frequency of collection and analyses for specific radionuclides and sample types as required by these specifications has been met or exceeded except where samples were biologically unavailable.

2. The Monitoring Program

Period Covered: This current report covers the period from July 1, 1980 to December 31, 1980.

Analytical Responsibility: Environmental radiological monitoring at Turkey Point Plant is carried out by the Dept. of Health and Rehabilitation Services of Florida (DHRS). All samples are collected and analyzed by DHRS personnel.

Number of Samples Analyzed: A total of 110 results were reported from 706 samples collected at 35 different sampling locations during the period of this report. TABLE 1 summarizes the mean and range values of these analyses.

Split-Sample Analyses: 13 samples were collected for analysis by the DOE in accordance with the DHRS/DOE split-sampling program.

3. Evaluation of Data

- a) Table 1 compares, where applicable, the analyses of media sampled at various locations with similar analyses of control location samples; shows the mean and range of similar analyses at all sampling locations; lists the location with the highest values noted for the type of analysis made.
- b) Where applicable, comparisons of test sample location data with that of the control sample indicate no difference in concentration levels except as noted in Table 1.
- c) Due to equipment failure, several fourth quarter tritium and strontium results are not yet available. A supplement to this report will be submitted when those results have been reported.

- d) Higher than normal values in Air Particulate - Gross Beta samples were observed in the fourth quarter. This observation corresponds to the timing of a Chinese weapons test on October 16, 1980. Increases were observed at all locations. Similar observations were made in samples for the St. Lucie Plant Environmental Monitoring Program.
- e) Cs 137 and Sr 90 were detected in a broad leaf vegetation food crop substitute at location T-56 (5.2.2). The values of radioactivity detected are within the expected range of activity for similar specimens throughout the state.
- f) The higher than normal level of tritium activity observed at location T-91 on 7/31/80 is attributed to subsurface interchange with the Turkey Point Cooling Canal System. The tritium observed in the cooling canal system (T-84) was also higher than typical but is within ranges which have been previously reported.
- g) All data have been analyzed and compared with previous data and are found to be consistent with values previously reported.

4. Conclusions

The concentration level of any radionuclide reported in TABLE I will contribute much less than the maximum permissible limits of individual or population group exposure that could result if there had been a continuous intake of radionuclides having concentration values equal to those permitted by APPENDIX B, TABLE II, 10-CFR-20. Therefore, the operations of Turkey Point Plant Units 3 & 4 are not contributing harmful effects of irreversible damage to either the environment or to the health and safety of individuals or population groups in the regions surrounding Turkey Point Plant.

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250, 251

LOCATION OF FACILITY Dade County, Florida, 9 miles East of Ft. City REPORTING PERIOD July 1, 1980-December 21, 1980

Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location (a)		Number of Nonroutine Reported Measurements	
			Number of		Results	Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range		
Sites	Samples													
1.0 Air Filter														
1.1 Air Particulate	pCi/M ³	Gross β	8	211 ¹⁾	211	.041	.005-.349	T-56, Princeton Substation, (8 miles NNW)	.049	.008-.349	.040	.009-.145		
1.1A Air Iodines	pCi/M ³	¹³¹ I	8	207	207	ND ^(b)	NA ^(b)	NA	NA	NA	ND	NA		
1.2 Direct Radiation	μRem/hr	γ	11	131 ³⁾	66 ²⁾	4.5	2.8-6.3	T-64, Natoma Substation (22 miles N)	5.6	4.7-6.3	5.6	4.7-6.3		
1.3 Precipitation	pCi/L		4	24										
		Gross β-DS			24	6.5	ND-22.3	T-64, Natoma Substation (22 miles N)	13.1	ND-22.3	13.1	ND-22.3		
		Gross β-U DS			24	ND	NA	NA	ND	NA	ND	NA		
		γ Scan			24	ND	NA	NA	ND	NA	ND	NA		
		³ H			16 ⁴⁾	ND ⁷⁾	NA	NA	ND	NA	ND	NA		

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NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250, 251LOCATION OF FACILITY _____ REPORTING PERIOD July 1, 1980-December 21, 1980

Medium or Pathway Sampled	Unit	Analysis for	Number of		All Indicator Locations		Location with Highest Mean			Control Location (a)		Number of Nonroutine Reported Measurements
			Sites	Samples	Results	Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	
2.0 Surface Water												
2.1.1 Estuarine	pCi/L		10	20								
		³ H			18 ⁴⁾	ND ⁷⁾	NA	NA	ND	NA	NA	NA
		40K			20	350	250-420	T-94, Pumpkin Key (8 miles SSE)	380	380-390	NA	NA
		89Sr			20	ND	NA	NA	ND	NA	NA	NA
		90Sr			20	ND	NA	NA	ND	NA	NA	NA
		Others			20	ND	NA	NA	ND	NA	NA	NA
2.1.2 Cooling Canal	pCi/L		2.	12 ^{1),5)}								
		³ H			7 ⁴⁾	3670	2390-7800	T-84, Cooling Canal Discharge, South of Bridge (0 miles)	4540	2710-7800	NA	NA
		40K			11	430	380-480	T-97, Loch Rosetta Onsite (0 miles)	430	380-460	NA	NA
		89Sr			11	ND	NA	NA	ND	NA	NA	NA
		90Sr			11	2.2	ND-2.2	T-84, Cooling Canal Discharge, South of Bridge (0 miles)	2.2	ND-2.2	NA	NA
		Others			11	ND	NA	NA	ND	NA	NA	NA

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Medium or Pathway Sampled	Unit	Analysis for	Number of		All Indicator Locations		Location with Highest Mean			Control Location (a)		Number of Nonroutine Reported Measurements
			Sites	Samples	Results	Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	
2.0 Surface Water												
2.1.3 Fresh Water	pCi/L		2	12								
		Gross β -DS			12	146.4	3.2-400	T-75, Fla City Canal at Old Salinity Dam (1 mile WNW)	290	200-400	NA	NA
		Gross β -UDS			12	ND	NA	NA	ND	NA	NA	NA
		^3H			8 ⁴⁾	460	ND-8) 720	T-75, Fla City Canal at Old Salinity Dam (1 mile WNW)	460	300-720	NA	NA
2.2 Potable Water Wells	pCi/L		3	6								
		Gross β -DS			6	7.7	4.2-11	T-57, Dolans Farm (4 miles NW)	11	11	NA	NA
		Gross β -UDS			6	ND	NA	NA	ND	NA	NA	NA
		^3H			5 ⁴⁾	ND ⁷⁾	NA	NA	ND	NA	NA	NA

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Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location (a)		Number of Nonroutine Reported Measurements
			Number of			Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range	
			Sites	Samples	Results								
2.0 Surface Water													
2.3 Ground Water Wells	pCi/L		6	12									
		⁴⁰ K			12	350	ND-450	T-90, Well E-20 (6 miles SSW)	450	ND-450	NA	NA	
		³ H			8 ⁴⁾	1470	730-3700	T-91, Well G10A (2 miles SW)	3700	3700	NA	NA	
		⁸⁹ Sr			12	ND	NA	NA	ND	NA	NA	NA	
		⁹⁰ Sr			12	ND	NA	NA	ND	NA	NA	NA	
		Others			12	ND	NA	NA	ND	NA	NA	NA	
3.0 Bottom Sediments													
3.1 Cooling Canal	pCi/kg		2	4									
		²²⁶ RA			4	2500	1250-3070	T-85, Discharge Canal West of 90° Bend (0 miles SW)	2850	2700-3000	NA	NA	
		⁶⁰ Co			4	190	100-310	T-85, Discharge Canal West of 90° Bend (0 miles SW)	200	100-310	NA	NA	
		⁸⁹ Sr			3 ⁴⁾	ND	NA	NA	ND	NA	NA	NA	
		⁹⁰ Sr			3 ⁴⁾	ND	NA	NA	ND	NA	NA	NA	
		Others			4	ND	NA	NA	ND	NA	NA	NA	

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Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location (a)		Number of Nonroutine Reported Measurements
			Number of			Mean		Sample Location	Mean	Range	Mean	Range	
			Sites	Samples	Results	Mean	Range	Distance and Direction					
3.0 Bottom Sediments													
3.2 Estuarine	pCi/kg		7	7									
		²²⁶ Ra			7	460	380-580	T-93, Pelican Bank (1.5 miles E)	580	580	NA	NA	
		⁶⁰ Co			7	ND	NA	NA	ND	NA	NA	NA	
		⁸⁹ Sr			7	ND	NA	NA	ND	NA	NA	NA	
		⁹⁰ Sr			7	ND	NA	NA	ND	NA	NA	NA	
		Others			7	ND	NA	NA	ND	NA	NA	NA	
4.0 Aquatic Biota													
4.1 Crustacea (d)(e)	pCi/kg		6	6									
		⁴⁰ K			6	2300	1500-2900	T-95, Long Arsenicker Key, (4 miles SSE)	2900	2900	NA	NA	
		²²⁶ Ra			6	1050	ND-1700	T-94, Pumpkin Key (8 miles SSE)	1700	1700	NA	NA	
		¹³⁷ Cs			6	ND	NA	NA	ND	NA	NA	NA	
		⁸⁹ Sr			5 ^{d)}	ND	NA	NA	ND	NA	NA	NA	
		⁹⁰ Sr			5 ^{d)}	ND	NA	NA	ND	NA	NA	NA	
		Others			6	ND	NA	NA	ND	NA	NA	NA	

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LOCATION OF FACILITY _____

REPORTING PERIOD July 1, 1980-December 21, 1980

Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location (a)		Number of Nonroutine Reported Measurements	
			Number of			Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range		
			Sites	Samples	Results									
4.0 Aquatic Biota														
4.2.A Fish-Carnivore (mixed Species)	pCi/kg		7	8 ¹⁾										
		40 _K			8	3400	2400-4100	T-95, Long Arsenicker Key (4 miles SSE)	4100	4100	NA	NA		
		226 _{Ra}			8	380	ND-380	T-84, Cooling Canal Discharge, South of Bridge (0 miles)	380	ND-380	NA	NA		
		137 _{Cs}			8	160	ND-160	T-84, Cooling Canal Discharge, South of Bridge, (0 miles)	160	ND-160	NA	NA		
		89 _{Sr}			5 ⁴⁾	ND	NA	NA	ND	NA	NA	NA		
		90 _{Sr}			5 ⁴⁾	ND	NA	NA	ND	NA	NA	NA		
		Others			8	ND	NA	NA	ND	NA	NA	NA		
4.2.B Fish-Herbivore (c)	pCi/kg		6	6										
		40 _K			6	2600	2500-2900	T-69, Caesar's Creek South End of Elliot Key (7 miles ESE)	2900	2900	NA	NA		
		226 _R			6	480	ND-620	T-94, Pumpkin Key (8 miles SSE)	620	620	NA	NA		
		89 _{Sr}			2 ⁴⁾	ND	NA	NA	ND	NA	NA	NA		
		90 _{Sr}			2 ⁴⁾	ND	NA	NA	ND	NA	NA	NA		
		Others			6	ND	NA	NA	ND	NA	NA	NA		

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			Number of			Mean	Range	Sample Location	Mean	Range	Mean	Range		
			Sites	Samples	Results									Distance and Direction
4.0 Aquatic Biota														
4.3.A Other-Turtle Grass	pCi/kg	40 _K 226 _{Ra} 60 _{Co} 89 _{Sr} 90 _{Sr} Others	6	6	6 6 6 5 ⁴ 5 ⁴ 6	880 ND ND ND ND ND	500-1300 NA NA NA NA NA	T-59, Elliot Key NA NA NA NA NA	1300 ND ND ND ND ND	1300 NA NA NA NA NA	NA NA NA NA NA NA	NA NA NA NA NA NA		
4.3.B Other-Sponge	pCi/kg	40 _K 60 _{Co} Others	6	6	6 6 6	1700 90 ND	1100-2000 ND-90 NA	T-59, Elliott Key T-69, Caesar's Creek South End of Elliott Key (7 miles ESE) T-86, West Arsenicker Key, Card Sound (3 miles SE) NA	2000 90 ND	2000 90 NA	NA NA NA	NA NA NA		

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			Number of		Results	Mean	Range	Sample Location	Mean	Range	Mean	Range		
			Sites	Samples										Distance and Direction
5.0 Terrestrial Biota														
5.2.1 Small Animal	pCi/kg		1	0 ⁶⁾										
5.2.2 Food Crops	pCi/kg		1	1										
		⁴⁰ K			1	6900	6900	T-52, Florida City Substation (7 miles W)	6900	6900	NA	NA		
		²²⁶ Ra			1	ND	NA	NA	ND	NA	NA	NA		
		¹³⁷ Cs			1	120	120	T-52, Florida City Substation (7 miles W)	120	120	NA	NA		
		⁸⁹ Sr			1	ND	NA	NA	ND	NA	NA	NA		
		⁹⁰ Sr			1	17	17	T-52, Florida City Substation (7 miles W)	17	17	NA	NA		
		Others			1	ND	NA	NA	ND	NA	NA	NA		

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Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location (a)		Number of Nonroutine Reported Measurements	
			Number of			Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range		
			Sites	Samples	Results									
5.0 Terrestrial Biota														
5.2.3 Mangrove Leaves	pCi/kg	40 ^K	7	7	7	2500	1900-4700	T-58, Entrance Road on Site (1 mile WSW)	4700	4700	NA	NA		
		226 ^{Ra}			7	340	340	T-64, Natoma Substation (22 miles N)	340	340	NA	NA		
		137 ^{Cs}			7	ND	NA	NA	ND	NA	NA	NA		
		89 ^{Sr}			6 ⁴)	ND	NA	NA	ND	NA	NA	NA		
		90 ^{Sr}			6 ⁴)	ND	NA	NA	ND	NA	NA	NA		
		Others			7	ND	NA	NA	ND	NA	NA	NA		
5.3 Soil	pCi/kg		7	7										
		226 ^{Ra}			7	1760	420-3600	T-56, Princeton Substation, (8 miles NNW)	3600	3600	420	420		
		137 ^{Cs}			7	220	ND-360	T-55, Silver Palm Drive (7 miles NNW)	360	360	ND	NA		
								T-56, Princeton Substation (8 miles NNW)						
		89 ^{Sr}			7	ND	NA	NA	ND	NA	ND	NA		
		90 ^{Sr}			7	ND	NA	NA	ND	NA	ND	NA		
		Others			7	ND	NA	NA	ND	NA	ND	NA		

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Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location ^(a)		Number of Nonroutine Reported Measurements
			Number of			Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range	
			Sites	Samples	Results								
NOTES													
1) Does not include DOE Split Samples 2) Average net response of two Dosimeters 3) Missing Dosimeter at location T-70, (8-4-80) Result based on one Dosimeter 4) Some results incomplete at time of report 5) Sample at T-84 (8-27-80) accidentally discarded 6) Sample attempts unsuccessful due to interference by a large local feral cat population 7) <300 pCi/L 8) <200 pCi/L													
a) T-64, Natoma Substation b) ND=Non Detectable NA=Not Applicable c) Mullet d) Blue Crab e) Shrimp													