

TURKEY POINT: Units 3 & 4

Environmental Radiological Monitoring

(1-01-79 to 6-30-79)

1. Introduction

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

All environmental samples were collected and analysed 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.

2. The Monitoring Program

Period Covered: This current report covers the period from January 1, 1979 to June 30, 1979.

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

Number of Samples Analyzed: A total of 698 analyses on samples collected from 35 different sampling locations were performed during the period of this report. TABLE 1 summarizes the mean and range values of these analyses.

Split-Sample Analyses: Twelve samples were collected to be analyzed by the DHRS/ERDA Split-sampling program.

3. Evaluation of Data

- a) As applicable, TABLE 1 reports data for sampling locations that have concentrations of a particular radionuclide higher than the observed mean for all sampling locations where the same type of sample material was collected and analyzed for that particular radionuclide.
- b) Recognition must be given that data reported herein could be influenced by the residual fallouts from the Chinese weapons tests of September, 1977 and the fallout from new Chinese tests carried out on March 14, 1978 and December 14, 1978.

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- c) The radioactive isotope ^{144}Ce found in sponges collected at locations T-59 and T-93 is due to fallout. Other locations showing radionuclide concentrations possibly attributable to fallout are:

Estuarine Sediments:	T-66, T-94
Aquatic Biota, crustacea:	T-94, T-66, T-81
fish:	T-66, T-59, T-95
Turtle grass:	T-66
Soil	T-55

- d) The ^3H concentration at sampling location T-84 is consistent with ^3H levels previously observed in the cooling canal system. The other canal location, T-97, had a slightly lower concentration of ^3H .
- e) No significant increases above previously reported data have been observed in Gross Beta-DS and ^3H concentrations at location T-75 in the Fresh Water Canals.
- f) The ^3H concentrations in the Ground Water Wells at sampling locations T-91 and T-92 continue to be of the same magnitude as previously reported.
- g) The concentration levels of ^{58}Co and ^{60}Co in the bottom sediments of the cooling canal at sample location T-84 continue to be of the same order of magnitude as previously reported.
- h) All data have been compared with pre-operational data and have been found to be within the $\pm 2\sigma$ limits observed.
- i) Where applicable, comparisons of test sample location data with that of the control sample show no differences in concentration levels except as noted in TABLE 1.



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 CFR20. 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.



ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

TURKEY POINT PLANT UNIT 3 & 4

DOCKET NO. 50-250, 251.

DADE COUNTY, FLORIDA

1-1-79 TO 6-30-79

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	Analyses	Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range	
1. Air Filters													
1.1 Air Particulates	pCi/m ³	Gross β	8	207	207	0.027	0.011-0.070	T-56: Princeton Substation (SW 248 St.), WNW, 8.5 miles	0.029	0.013-0.070	0.254	0.013-0.039	None
								T-58: On-Site Entrance Road; WNW, 1 mile	0.028	0.15-0.47			
								T-72: Boy Scout Camp, on site	0.028	0.013-0.051			
								T-52: Florida City Substation; W. 8 miles	0.027	0.011-0.054			
1.1.A Air Iodines	pCi/m ³	¹³¹ I	8	207	207	ND	NA	None			ND	NA	None
1.2 Direct Radiation	μ Rem/hr	γ	11	66	66	5.19	2.8-8.0	T-64: Natoma Substation; ENE, 30 miles	6.13	4.2-8.0	6.13	4.2-8.0	None
								T-56: Princeton Substation (SW 248 St.) WNW 8.5 mi.	5.70	4.7-6.6			
								T-58: On-Site Entrance Road, WNW, 1 mile	5.53	4.2-7.0			
								T-52: Florida City Substation; W., 8 miles	5.43	4.5-6.4			
1.3 Precipitation	pCi/L	Gross β -DS	4	20	18	1.39	ND-9.0	T-79: Guardhouse, on site	4.8	ND-9.0	ND	NA	None
		Gross β -LDS	4	20	18	ND	NA	NA	NA	NA	ND	NA	None
		γ Scan	4	20	18	ND	NA	NA	NA	NA	ND	NA	None
		³ H	4	20	18	ND	NA	NA	NA	NA	ND	NA	None



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	Analyses	Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range	
2.0 Water													
2.1.1 Estuarine	pCi/L	³ H	10	20	20	<200	NA	NA	NA	NA	NA	NA	None
		⁴⁰ K	10	20	20	355.5	260-430	T-66: Card Sound, North of Causeway	395	390-400	NA	NA	None
		⁸⁹ Sr	10	20	20	ND	NA		NA	NA	NA	NA	None
		⁹⁰ Sr	10	20	20	ND	NA		NA	NA	NA	NA	None
2.1.2 Cooling Canal	pCi/L	³ H	2	12	12	4191	3000-5200	T-84: Discharge Canal, South side of Bridge	4233	3100-5200	NA	NA	None
		⁴⁰ K	2	12	12	405	360-440	T-84: Discharge Canal, South side of Bridge	411.6	370-440	NA	NA	None
		⁸⁹ Sr	2	12	11	ND	NA		NA	NA	NA	NA	None
		⁹⁰ Sr	2	12	11	ND	ND-1.0	T-84: Discharge Canal, South side of Bridge	ND	ND-1.0	NA	NA	None
2.1.3 Fresh Water Canals	pCi/L	Gross β -DS	2	12	12	161.3	4.0-370	T-75: Florida City, Canal, NNN, 1.5 miles	316.6	270-370	NA	NA	None
		Gross β -DS	2	12	12	ND	NA		NA	NA	NA	NA	None
		³ H	2	12	12	283.6	ND-640	T-75: Florida City Canal, NNN, 1.5 miles	368.2	ND-640	NA	NA	None
2.2 Potable Water Wells	pCi/L	Gross β -DS	3	6	6	8.67	5.0-15	T-57: Dolan's Farm, WNW, 4.5 miles	14.5	14-15	NA	NA	None
		Gross β -UDS	3	6	6	ND	NA		NA	NA	NA	NA	None
		³ H	3	6	6	ND	NA		NA	NA	NA	NA	None



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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	Analyses	Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range		
3.2 Estuarine	pCi/Kg	²²⁶ Ra	7	7	7	547	300-1200	T-66*: Card Sound, North of Causeway	1200*	NA	NA	NA	None	
		²³² Th	7	7	7	118	ND-180	T-94*: Pumpkin Key, Card Sound, SSE, 8 miles	180*	NA	NA	NA	None	
		⁴⁰ K	7	7	7	171	ND-600	T-95*:	600*	NA	NA	NA	None	
		⁶⁰ Co	7	7	7	ND	NA		NA	NA	NA	NA	None	
		⁸⁹ Sr	7	7	7	ND	NA		NA	NA	NA	NA	None	
		⁹⁰ Sr	7	7	7	ND	NA		NA	NA	NA	NA	None	
4. Aquatic Biota														
4.1 Crustacea	pCi/kg	⁴⁰ K	6	6	6	1883	1300-2400	T-94*(e): Pumpkin Key, Card Sound, SSE, 8 miles	2400*	NA	NA	NA	None	
		²²⁶ Ra	6	6	6	260	ND-500	T-66*(f): Card Sound, North of Causeway	500*	NA	NA	NA	None	
		²³² Th	6	6	6	140	ND-300	T-66*(f): Card Sound, North of Causeway	300*	NA	NA	NA	None	
		¹⁰⁶ Ru	6	6	6	115	ND-340	T-81*(e)	340*	NA	NA	NA	None	
		⁸⁹ Sr	6	6	6	ND	NA		NA	NA	NA	NA	None	
		⁹⁰ Sr	6	6	6	ND	NA		NA	NA	NA	NA	None	
4.2.A Fish - Carnivore	pCi/kg	⁴⁰ K	6	6	6	3467	ND-4100	T-95*	4100	NA	NA	NA	None	
		²²⁶ Ra	6	6	6	380	ND-700	T-66*: Card Sound, North of Causeway *One Sample						



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	Analyses	Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range	
4.2.A Fish - Carnivore (continued)	pCi/kg	²³² Th	6	6	6	140	ND-200	T-59*: Elliott Key, E., 9 miles	200*	NA	NA	NA	None
								T-66*: Card Sound, North of Causeway	200*	NA	NA	NA	None
		¹⁰⁶ Ru	6	6	6	267	ND-500	T-94*: Pumpkin Key, Card Sound, SSE, 8 miles	500*	NA	NA	NA	None
		⁸⁹ Sr	6	6	6	ND	NA		NA	NA	NA	NA	None
4.2.B Fish - Herbivore (c)	pCi/kg	⁹⁰ Sr	6	6	6	ND	NA		NA	NA	NA	NA	None
		⁴⁰ K	6	6	6	2900	2300-3300	T-81*	3300*	NA	NA	NA	None
		²²⁸ Ra	6	6	6	360	ND-500	T-66*: Card Sound, North of Causeway	500*	NA	NA	NA	None
		²³² Th	6	6	6	270	200-500	T-95*	500*	NA	NA	NA	None
		¹⁰⁶ Ru	6	6	6	ND	NA		NA	NA	NA	NA	None
		⁸⁹ Sr	6	6	6	ND	NA		NA	NA	NA	NA	None
		⁹⁰ Sr	6	6	6	ND	NA		NA	NA	NA	NA	None
		⁴⁰ K	6	6	6	250	ND-1000	T-66*: Card Sound, North of Causeway	1000*	NA	NA	NA	None
4.3.B Other - Turtle Grass	pCi/kg	²³² Th	6	6	6	116	ND-180	T-66*: Card Sound, North of Causeway	180*	NA	NA	NA	None
								*One Sample					

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	Analyses	Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range	
4.3.B Other - Turtle Grass (continued)	pCi/kg	¹⁰⁶ Ru	6	6	6	ND*	NA		NA	NA	NA	NA	None
		¹⁴⁴ Ce	6	5	5	ND	NA		NA	NA	NA	NA	None
		⁶⁰ Co	6	5	5	ND	NA		NA	NA	NA	NA	None
		⁸⁹ Sr	6	6	6	ND	NA		NA	NA	NA	NA	None
		⁹⁰ Sr	6	6	6	ND	NA		NA	NA	NA	NA	None
4.3.B Other - Sponge	pCi/kg	⁴⁰ K	6	6	6	1283	ND-1800	T-49*: Elliott Key, E., 9 miles	1800*	NA	NA	NA	None
		²³² Th	6	6	6	ND	NA		NA	NA	NA	NA	None
		¹⁴⁴ Ce	6	6	6	417	ND-2000	T-59*: Elliott Key, E., 9 miles	2000*	NA	NA	NA	None
		⁶⁰ Co	6	6	6	40	ND-120	T-93*: Pelican Bank, Card Sound, E. 1.7 miles	120*	NA	NA	NA	None
5. Terrestrial Biota													
5.2.1 Small Animal (d)	pCi/kg	⁴⁰ K	1	1	1	3600	NA		NA	NA	NA	NA	None
		²³² Th	1	1	1	300	NA		NA	NA	NA	NA	None
		¹³⁷ Cs	1	1	1	3700	NA		NA	NA	NA	NA	None
*One Sample													



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	Analyses	Mean	Range	Sample Location Distance and Direction	Mean	Range	Mean	Range	
5.2.2 Food Crops	pCi/kg	⁴⁰ K	3	3	3	3066	2200-4400	T-57*(g): Dolan's Farm, WNW, 4.5 miles	4400*	NA	NA	NA	None
		²³² Th	3	3	3	ND	NA			NA	NA	NA	None
		¹³⁷ Cs	3	3	3	ND	NA			NA	NA	NA	None
		⁸⁹ Sr	3	3	3	ND	NA			NA	NA	NA	None
		⁹⁰ Sr	3	3	3	1.86	ND-4.0	T-55*(h): Silver Palm Drive (SW 232 St.)	4.0*	NA	NA	NA	None
5.2.3 Mangrove Leaves	pCi/kg	⁴⁰ K	7	7	7	3386	2600-4900	T-59*: Elliott Key, E., 9 miles	4900*	NA	NA	NA	None
		²³² Th	7	7	7	ND	NA			NA	NA	NA	None
		¹³⁷ Cs	7	7	7	ND	NA			NA	NA	NA	None
		⁸⁹ Sr	7	7	7	ND	NA			NA	NA	NA	None
		⁹⁰ Sr	7	7	7	6.9	ND-21	T-51*: Homestead Bayfront Park, NNW, 2 miles	21*	NA	NA	NA	None
5.3 Soil	pCi/kg	²²⁶ Ra	7	7	7	1629	500-2600	T-55*: Silver Palm Drive (SW 232 St.)	2600*	NA	NA	NA	None
								T-57*: Dolan's Farm, WNW, 4.5 miles	2600*	NA	NA	NA	None
		²³² Th	7	7	7	294	ND-500	T-55*: Silver Palm Drive (SW 232 Street)	500*	NA	NA	NA	None
		¹³⁷ Cs	7	7	7	350	ND-620	T-56*: Princeton Substation, WNW, 8.5 miles	620*	NA	NA	NA	None
		⁸⁹ Sr	7	7	7	ND	NA			NA	NA	NA	None
		⁹⁰ Sr	7	7	7	ND	NA			NA	NA	NA	None

*One Sample

Notes:

- (a) T-64: Natoma Substation, Miami, ENE, 30 miles
- (b) ND = Non Detectable NA = Non Applicable
- (c) Mullet
- (d) Opossum
- (e) Shrimp
- (f) Blue Crab
- (g) Potatoes
- (h) Corn

