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 AUTH. NAME AUTHOR AFFILIATION  
 OBLER, B.O. Carolina Power & Light Co.  
 STARKEY, R.B. Carolina Power & Light Co.  
 RECIP. NAME RECIPIENT AFFILIATION

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Shearon Harris Energy & Environmental Center  
Carolina Power & Light Company  
New Hill, North Carolina

ENVIRONMENTAL RADIOLOGICAL MONITORING REPORT  
FOR  
H. B. ROBINSON STEAM ELECTRIC PLANT  
JANUARY 1, 1981, THROUGH DECEMBER 31, 1981

Prepared By:

Barbara O. Obler  
Barbara O. Obler

Reviewed By:

Don H. Edwards  
Don H. Edwards  
Senior Specialist - Environmental

Approved By:  
Original Signed By

G. H. WARRINER

George H. Warriner  
Principal Specialist - Environmental

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R PDR

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## 1.0 INTRODUCTION

The following report summarizes the Environmental Radiological Monitoring conducted for the H. B. Robinson Steam Electric Plant during the calendar year 1981. This is the fifth year in which the program's sample analyses and data interpretation have been entirely performed by Carolina Power & Light Company.

### 1.1 Plant and Location

The H. B. Robinson Steam Electric Plant is located in northeastern South Carolina near Hartsville and approximately 25 miles northwest of Florence. This site includes a fossil-fueled plant, Unit 1, which was placed in service in 1960, and a pressurized water nuclear power reactor, Unit 2, which entered commercial operation on March 7, 1971. The Robinson Impoundment (hereafter referred to as Lake Robinson) on the plant site was created for Unit 1 and is also a cooling reservoir for Unit 2. Lake Robinson has an area of 2,250 acres with plant intake at the south end, adjacent to the dam. Following condenser use, the water is returned by a 4.2-mile canal to the north end of Lake Robinson near the mouth of Black Creek which flows into the lake from the north.

### 1.2 Radiological Impact Considerations

The most significant mode of population exposure due to plant operation is direct external radiation exposure due to the elevated plume of noble gases. Other potentially important exposure pathways to man are the airborne radioiodine-pasture-milk and consumption of fish from Lake Robinson. While relatively insignificant dose is experienced, contact with Lake Robinson, including fishing, boating, and immersion (swimming), is a secondary dose path to man.

### 1.3 Environmental Monitoring Program

The significant elements of these exposure pathways were used to establish the present surveillance program. The program, as presently implemented, is

an expansion of that required by the H. B. Robinson Environmental Technical Specifications. Table 1-1 details the surveillance program, and Figures 1-1 and 1-2 show the environmental monitoring locations.

A tabulation of the specific methods used in monitoring the various pathways of exposure to man is as follows:

#### Gaseous Effluent Path

Submersion Dose and  
other External Dose

Thermoluminescent Dosimetry  
Area Monitors

Vegetation Path

Vegetation Samples  
Soil Samples  
Air Samples

Inhalation Path

Air Samples

Milk Path

Milk Samples  
Feed and Fodder Crop  
Air Samples

#### Liquid Effluent Path

Fish Path

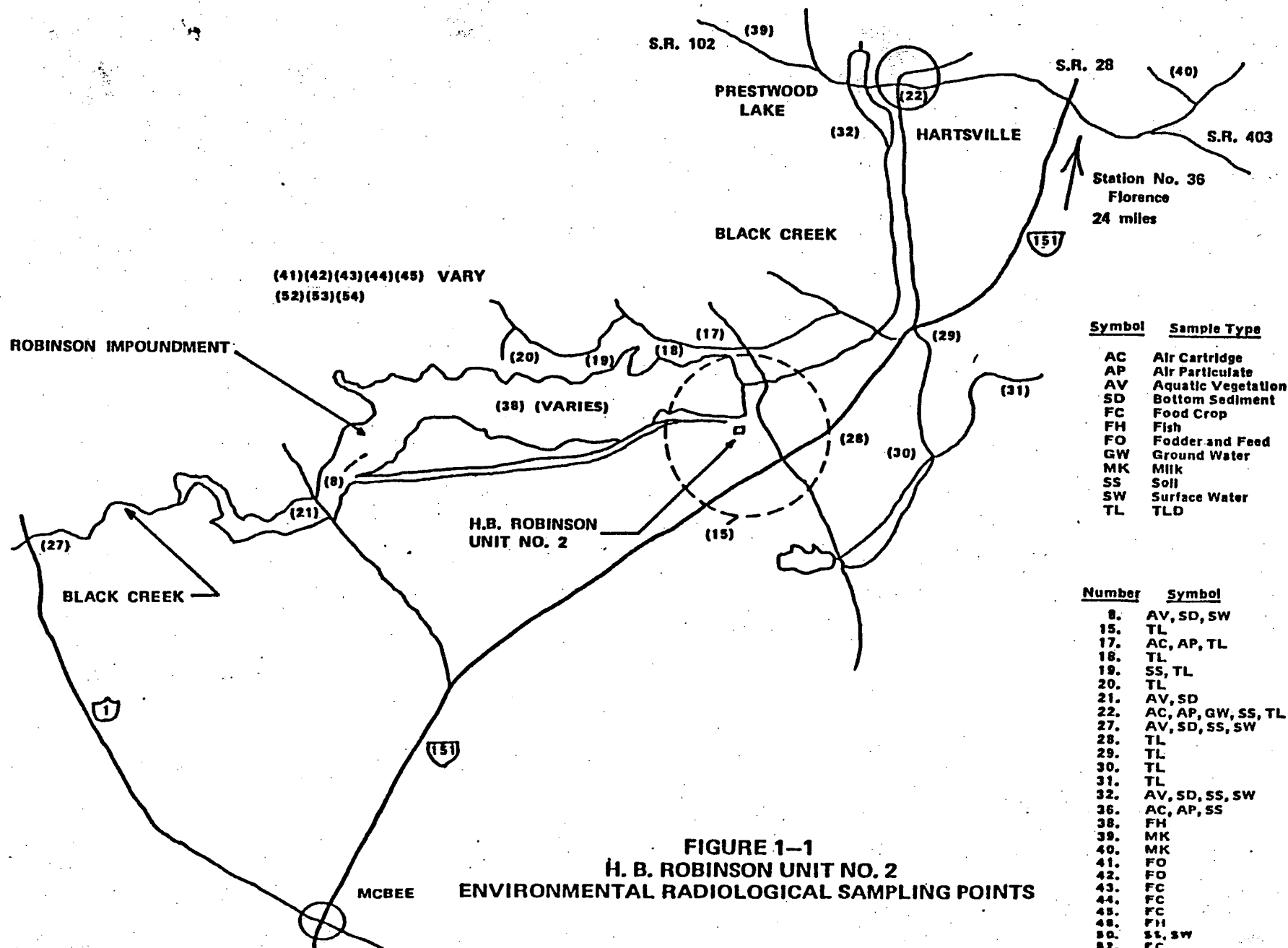
Surface Water Samples  
Bottom Sediment Samples  
Aquatic Vegetation Samples  
Fish Samples

Water and Shoreline Dose

Thermoluminescent Dosimetry  
Area Monitors  
Surface Water Samples  
Bottom Sediment Samples  
Shoreline Sediment

Drinking Water Path

Groundwater Samples



**FIGURE 1-1**  
**H. B. ROBINSON UNIT NO. 2**  
**ENVIRONMENTAL RADIOLOGICAL SAMPLING POINTS**



NUMBER	SYMBOL
1.	TL
2.	AC, AP, SS
3.	TL
4.	TL
5.	SD, R&G, SW
6.	TL
7.	TL
9.	AC, AP, SS, TL
10.	TL
11.	AV, SD, SS, SW, TL

STATION NUMBER	SYMBOL
12.	TL
13.	TL
14.	TL
16.	TL
23.	GW
24.	GW
33.	AV, SD
34.	AC, AP, SS
35.	AC, AP, SS
49.	SS

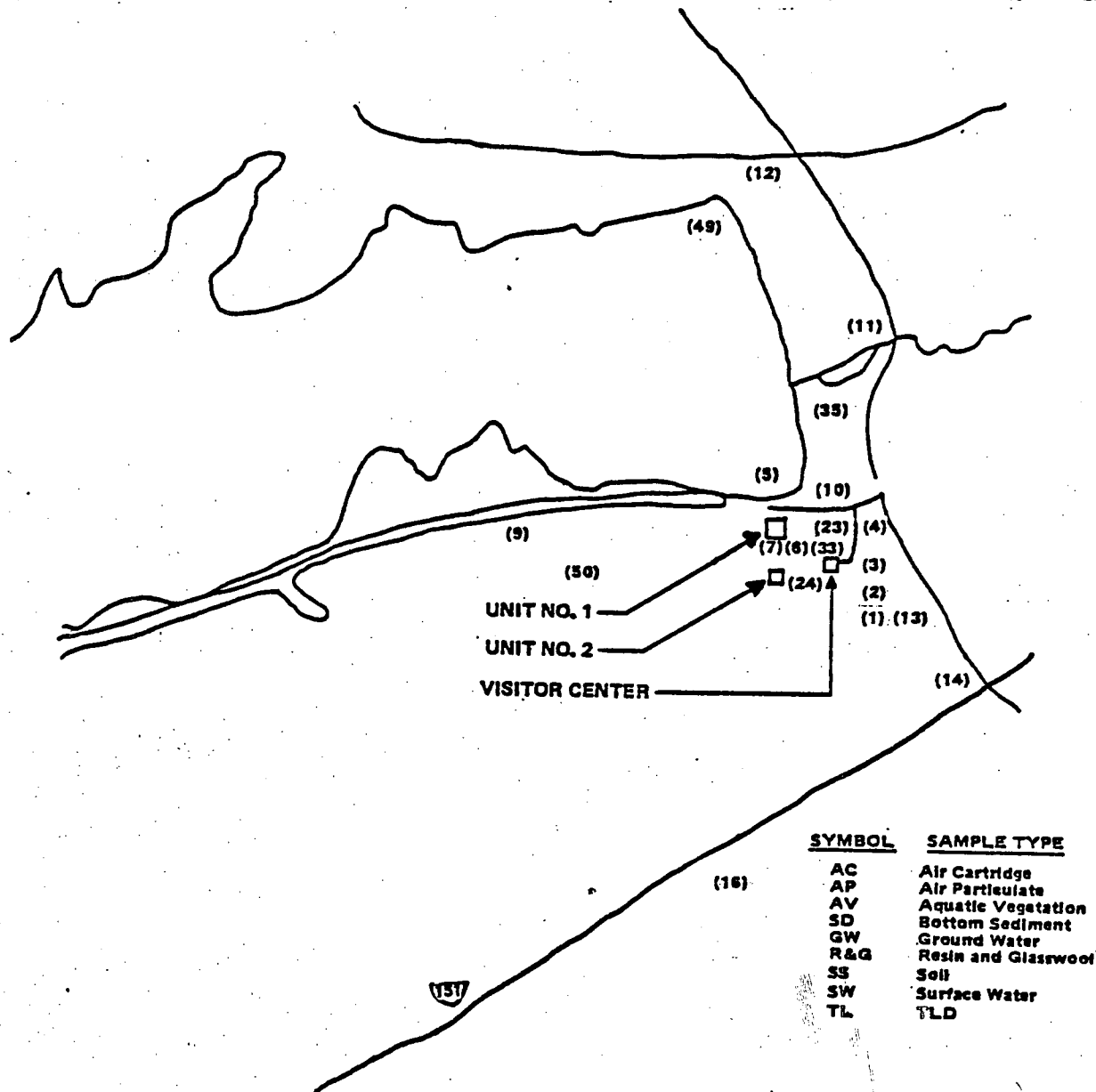


FIGURE 1-2  
H. B. ROBINSON UNIT NO. 2  
ENVIRONMENTAL RADIOLOGICAL SAMPLING POINTS

TABLE I-1

**ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM  
H. B. ROBINSON STEAM ELECTRIC PLANT**

<u>Sample Type</u>	<u>Sampling Point and Description</u>	<u>Sampling Frequency</u>	<u>Sample Size</u>	<u>Sample Analysis</u>
Air Cartridge (AC)	2-Visitor's Center 9-Microwave Tower 17-East Shore of Lake Across from Plant Intake 22-Hartsville <sup>1</sup> 34-End of Construction Road West of Plant 35-Dam (West End) 36-Florence	Weekly	300 cu. m.	Iodine
Air Particulate (AP)	2-Visitor's Center 9-Microwave Tower 17-East Shore of Lake Across from Plant Intake 22-Hartsville <sup>1</sup> 34-End of Construction Road West of Plant 35-Dam (West End) 36-Florence	Weekly	300 cu. m.	Weekly--Gross Alpha and Gross Beta, Gamma if Gross Beta > 100 pCi/m <sup>3</sup> , Monthly Composite Gamma and Sr-89, 90

TABLE 1-1 (cont'd)

Sample Type	Sampling Point and Description	Sampling Frequency	Sample Size	Sample Analysis
Aquatic Vegetation (AV)	8-Discharge Canal Outfall	Quarterly	500 grams	Gross Beta, Gamma, and Sr-89, 90
	11-Black Creek at Road 1623			
	21-Bridge at North End of Lake	Monthly <sup>2</sup>	500 grams	Gross Beta, Gamma, and Sr-89, 90
	27-Black Creek at U.S. 1 <sup>1</sup>			
	32-Prestwood Lake	Semiannual	500 grams	Gamma
	33-Ditch Behind Visitor's Center			
	50-Ash Pond <sup>4</sup>			
Bottom Sediment (SD)	5-Plant Intake	Quarterly	500 grams	Gross Beta, <sup>40</sup> K, Gamma, and Sr-89, 90
	8-Discharge Canal Outfall			
	11-Black Creek at Road 1623	Monthly <sup>2</sup>	500 grams	Gross Beta, Gamma, and Sr-89, 90
	21-Bridge at North End of Lake			
	27-Black Creek at U.S. 1 <sup>1</sup>			
	32-Prestwood Lake			
	33-Ditch Behind Visitor's Center			
Feed Crop (FO)	41-Varies 42-Varies	Twice during growing season (started 1977)	500 grams	Gamma
Fish (FH)	38-Site Varies within Lake Robinson	Quarterly	500 grams	Flesh--Gross Beta, <sup>40</sup> K, Gamma, and Sr-89, 90, Bone--Sr-89, 90

TABLE 1-1 (cont'd)

<u>Sample Type</u>	<u>Sampling Point and Description</u>	<u>Sampling Frequency</u>	<u>Sample Size</u>	<u>Sample Analysis</u>
Food Crop (FC)	43-Varies	One tobacco sample during growing season and one sample after it has been cured (started 1977). Twice during growing season (started 1977)	500 grams	Gamma
	44-Varies 45-Varies 52-Varies 53-Varies 54-Varies		500 grams	Gamma
Groundwater (GW)	22-Hartsville 23-Unit 1 Well near Site Entrance 24-Well at West Side of Unit 2	Quarterly (started 1st quarter, 1977)	4 liters	Gross Alpha, Gross Beta, Tritium, Gamma, and Sr-80, 90
Milk (MK)	39-Lyndale's Farm 40-Fink's Farm	Monthly	8 liters	Iodine, Gamma, and Sr-89, 90

TABLE 1-1 (cont'd)

Sample Type	Sampling Point and Description	Sampling Frequency	Sample Size	Sample Analysis
Soil (SS)	2-Visitor's Center 9-Microwave Tower 11-Black Creek at Road 1623 19-East Shore of Lake (North of 18) 22-Hartsville 27-Black Creek at U.S. 1 32-Prestwood Lake 34-End of Construction Road West of Plant 35-Dam (West End) 36-Florence	*Every 3 years	500 grams	Gross Beta, $^{40}\text{K}$ , Gamma, SR-89, 90 on a composite of each station.
	49-East Shore of Lake at Boat Launch 50-Ash Pond <sup>4</sup>	Semiannual (1 square foot by 1-inch deep)	500 grams	Gross Beta, $^{40}\text{K}$ , Gamma
*Two sample locations will be sampled semiannually on a rotating basis.				
Surface Water (SW)	5-Plant Intake 8-Discharge Canal Outfall 32-Prestwood Lake 11-Black Creek at Road 1623 27-Black Creek at U.S. 1 <sup>1</sup>	Weekly	2.5 liters	Weekly--Gross Alpha, Gross Beta and Tritium, (Gamma and SR-89, 90 if Gross Beta > 100 pCi/l) Monthly Composite--Gross Alpha, Gross Beta, Tritium, Gamma, and Sr-89, 90
	50-Ash Pond <sup>4</sup>	Twice Weekly <sup>3</sup> Weekly (started on 3/4/77) Monthly		Quarterly Composite--Gross Alpha, Gross Beta, Tritium (Gamma and SR-89 90 if Gross Beta > 100 pCi/l) Gamma
	5-Plant Intake (in Exchange Resin) 5-Plant Intake (Glasswool)	Weekly	2,000 liters	

TABLE I-1 (cont'd)

<u>Sample Type</u>	<u>Sampling Point and Description</u>	<u>Sampling Frequency</u>	<u>Sample Size</u>	<u>Sample Analysis</u>
External Radiation Dose (TL)	1-South Property Line near Construction Road	Monthly	Not Applicable	TLD Readout
	3-South Property Line near Visitor's Center			
	4-South Property Line near Road 1623			
	6-Robinson Unit 1			
	7-Robinson Unit 1			
	9-Microwave Tower			
	10-Picnic Area			
	11-Black Creek at Road 1623			
	12-Intersection of Roads 1623 and 1639			
	13-West Property Line near Construction Road			
	14-Intersection Area for Road 1623 and Route 151			
	15-Pine Ridge Baptist Church and Route 151			
	16-Route 151 - 0.5 mile North of Road 1623			
	17-East Shore of Lake across from Plant Intake			
	18-East Shore of Lake (North of 17)			
	19-East Shore of Lake (North of 18)			

TABLE 1-1 (cont'd)

<u>Sample Type</u>	<u>Sampling Point and Description</u>	<u>Sampling Frequency</u>	<u>Sample Size</u>	<u>Sample Analysis</u>
External Radiation Dose (TL) (cont'd)	20-East Shore of Lake (North of 19) 22-Hartsville <sup>1</sup> 28-Intersection of Transmission Lines and Route 151 29-Intersection of S.C. 200 and Route 151 30-Intersection of S.C. 200 and S.C. 53 31-Kelly Town	Monthly	Not Applicable	TLD Readout

<sup>1</sup>Control Station

<sup>2</sup>This particular location (Sample Station 33) is a direct pathway for radionuclides released to the environment through untreated liquid releases. Based on previous elevated results, a more frequent sampling program is indicated.

<sup>3</sup>This location is sampled more frequently as a result of a directive by the NRC to CP&L due to no composite sampler being available.

<sup>4</sup>This location was added in 1981 and will be sampled monthly for surface water and semiannually for soil and aquatic vegetation.

## 2.0 PROGRAM SUMMARY

The purpose of the Environmental Radiological Monitoring Program is to measure any accumulation of radioactivity in the environment, to determine whether this radioactivity is the result of the operation of the H. B. Robinson Plant, and to interpret the potential dose to off-site populations based on the accumulative measurement of plant origin.

Control stations are not specified in the Technical Specifications to the operating license. For this report, the following locations were used as the control locations for the respective measurements and were intended to indicate conditions away from the H. B. Robinson Plant influence:

### Hartsville (Sample Station 22)

Thermoluminescent Dosimetry Area Monitors  
Air Particulate Samples  
Charcoal Cartridge Samples - Airborne  $^{131}\text{I}$

### Black Creek above Lake Robinson at U.S. #1 (Sample Station 27)

Aquatic Vegetation  
Bottom Sediment  
Surface Water

No specific control locations have been designated for food crops, feed crops, soil, milk, fish, and groundwater, since none of the stations sampled are points selected to be unaffected by station effluents.

Table 2-1 summarizes the environmental radiological monitoring data for the entire year of 1981.



TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Air Cartridge (pCi/m <sup>3</sup> )	I-131 364	7.00E-2	All less than MDA	All less than MDA	All less than MDA	N/A
Air Particulate (pCi/m <sup>3</sup> ) (4)	Gross Alpha 363	2.00E-3	7.50E-3 (288/311) 6.03E-4 - 1.02E-1	Dam - West End 0.4 mi. E 9.59E-3 (48/52) 1.25E-3 - 1.02E-1	7.01E-3 (45/52) 1.54E-3 - 3.71E-2	N/A
	Gross Beta 363	3.00E-3	1.27E-1 (310/311) 2.91E-3 - 7.66E-1	Dam - West End 0.4 mi. E 1.45E-1 (52/52) 2.06E-2 - 6.13E-1	1.30E-1 (52/52) 2.08E-2 - 5.59E-1	N/A
	Sr-89 84	1.40E-3	1.37E-2 (40/72) 1.83E-4 - 3.27E-2	Florence 26 mi. SW 1.96E-2 (5/12) 5.76E-3 - 2.71E-2	1.15E-2 (6/12) 3.09E-3 - 1.88E-2	N/A
	Sr-90 84	9.00E-4	3.66E-3 (18/72) 2.91E-4 - 1.48E-2	End of Construction Rd. W. of Plant 0.2 mi. W 4.96E-3 (4/12) 6.84E-4 - 1.48E-2	1.85E-3 (2/12) 1.03E-3 - 2.67E-3	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Air Particulate (pCi/m <sup>3</sup> )	Gamma 84 Mn-54	6.00E-3	3.01E-3 (2/72) 2.00E-3 - 4.03E-3	Microwave Tower 0.7 mi. N	4.03E-3 (1/12) (single value)	All less than MDA	N/A
	Nb-95	4.00E-3	5.89E-2 (31/72) 1.84E-3 - 2.16E-1	Dam - West End 0.4 mi. E	9.25E-2 (5/12) 4.78E-3 - 2.16E-1	5.30E-2 (6/12) 3.56E-3 - 1.58E-1	N/A
	Zr-95	1.00E-2	3.84E-2 (41/72) 2.38E-3 - 1.02E-1	Visitor's Center 0.2 mi. SW	5.60E-2 (6/12) 1.34E-2 - 1.02E-1	3.95E-2 (6/12) 1.49E-2 - 7.63E-2	N/A
	Ru-103	8.00E-3	2.01E-2 (36/72) 1.28E-3 - 4.18E-2	Dam - West End 0.4 mi. E	2.40E-2 (6/12) 3.86E-3 - 4.18E-2	1.83E-2 (6/12) 3.25E-3 - 3.70E-2	N/A
	Ru-106	6.30E-2	3.11E-2 (3/72) 1.72E-2 - 4.04E-2	End of Construction Rd. W. of Plant 0.2 mi. W	3.80E-2 (2/12) 3.56E-2 - 4.04E-2	4.27E-2 (1/12) (single value)	N/A
	Cs-137	6.00E-3	3.07E-3 (15/72) 1.24E-3 - 5.14E-3	East Shore of Lake Across from Plant Intake 0.9 mi. ENE	5.14E-3 (1/12) (single value)	5.64E-3 (1/12) (single value)	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

U. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Air Particulate (pCi/m <sup>3</sup> )	Gamma						
	84		1.44E-2 (33/72)	Microwave Tower	1.80E-2 (4/12)	1.15E-2 (6/12)	
	Ce-141	5.00E-3	2.15E-3 - 3.06E-2	0.7 mi. N	1.19E-2 - 2.32E-2	3.04E-3 - 1.68E-2	N/A
	Ce-144	2.60E-2	3.34E-2 (37/72) 8.81E-3 - 1.03E-1	Dam - West End 0.4 mi. E	4.33E-2 (6/12) 1.67E-2 - 1.03E-1	3.10E-2 (6/12) 8.89E-3 - 6.42E-2	N/A
Aquatic Vegetation (pCi/gram dry) (5)	Gross Beta		2.58E+1 (26/27)	Black Creek at	4.94E+1 (4/4)	7.95E+0 (4/4)	
	31	4.00E+0	3.30E+0 - 1.64E+2	Road 1623	5.95E+0 - 1.64E+2	4.53E+0 - 1.15E+1	N/A
				0.6 mi. ESE			
	Sr-89		1.08E+0 (6/27)	Ditch Behind	1.74E+0 (2/11)	5.12E+0 (1/4)	
	31	1.30E-1	4.32E-1 - 2.47E+0	Visitor's Center	1.01E+0 - 2.47E+0	(single value)	N/A
				0.1 mi. SW			
	Sr-90		1.95E-1 (8/27)	Discharge Canal	2.43E-1 (3/4)		
	31	6.10E-2	6.04E-2 - 3.11E-1	Outfall	1.25E-1 - 3.11E-1	All less than MDA	N/A
				3.8 mi. N			

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Aquatic Vegetation (pCi/gram dry) (5)	Gamma 31 Mn-54	6.50E-2	2.07E-1 (12/27) 1.12E-1 - 3.81E-1	Discharge Canal Outfall 3.8 mi. N 3.81E-1 (1/4) (single value)	All less than MDA	N/A
	Co-58	6.00E-2	4.90E-1 (4/27) 7.99E-2 - 1.27E+0	Ditch Behind Visitor's Center 0.1 mi. SW 6.27E-1 (3/11) 2.09E-1 - 1.27E+0	All less than MDA	N/A
	Co-60	6.50E-2	2.29E+0 (13/27) 2.01E-1 - 1.10E+1	Ditch Behind Visitor's Center 0.1 mi. SW 3.92E+0 (6/11) 1.08E+0 - 1.10E+1	All less than MDA	N/A
	Nb-95	6.00E-2	1.41E+0 (15/27) 2.02E-1 - 6.80E+0	Prestwood Lake 4.9 mi. ESE 3.70E+0 (2/4) 5.91E-1 - 6.80E+0	5.46E-1 (3/4) 3.27E-1 - 6.72E-1	N/A
	Zr-95	1.10E-1	9.88E-1 (15/27) 4.86E-1 - 3.01E+0	Prestwood Lake 4.9 mi. ESE 3.01E+0 (1/4) (single value)	All less than MDA	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Aquatic Vegetation (pCi/gram dry) (5)	Gamma  31  Ru-103	5.50E-2	3.47E-1 (15/27)  7.74E-2 - 1.00E+0	Discharge Canal  Outfall  3.8 mi. N	  8.88E-1 (1/4)  (single value)	  1.56E-1 (2/4)  1.27E-1 - 1.86E-1	    N/A
	Ru-106	5.50E-1	8.22E-1 (1/27)  (single value)	Ditch Behind  Visitor's Center  0.1 mi. SW	  8.22E-1 (1/11)  (single value)	  All less than MDA	  N/A
	Cs-134	6.50E-2	6.36E-1 (1/27)  (single value)	Ditch Behind  Visitor's Center  0.1 mi. SW	  6.36E-1 (1/11)  (single value)	  All less than MDA	  N/A
	Cs-137	7.00E-2	1.64E+0 (25/27)  1.64E-1 - 1.14E+1	Bridge at North  End of Lake  4.7 mi. N	  3.31E+0 (4/4)  5.46E-1 - 1.14E+1	  4.19E+0 (4/4)  1.32E-1 - 1.57E+1	    N/A
	Cs-139	4.00E-2	1.21E-1 (1/27)  (single value)	Ditch Behind  Visitor's Center  0.1 mi. SW	  1.21E-1 (1/11)  (single value)	  All less than MDA	  N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Aquatic Vegetation (pCi/gram dry) (5)	Gamma 31 Ce-141	6.50E-2	3.58E-1 (11/27) 1.15E-1 - 7.21E-1	Prestwood Lake 4.9 mi. ESE	6.04E-1 (2/4) 4.88E-1 - 7.21E-1	All less than MDA	N/A
	Ce-144	2.65E-1	2.98E+0 (19/27) 3.56E-1 - 3.77E+1	Ditch Behind Visitor's Center 0.1 mi. SW	7.07E+0 (6/11) 5.87E-1 - 3.77E+1	7.27E-1 (1/4) (single value)	N/A
Bottom Sediment (pCi/gram dry)	Gross Beta 36	1.10E-1	2.28E+0 (30/32) 2.01E-1 - 8.13E+0	Ditch Behind Visitor's Center 0.1 mi. SW	3.99E+0 (12/12) 9.65E-1 - 5.99E+0	7.93E-1 (3/4) 7.18E-1 - 8.38E-1	N/A
	Sr-89 36	5.00E-1	4.44E+0 (5/32) 3.85E-1 - 1.68E+1	Black Creek at Road 1623 0.6 mi. ESE	1.68E+1 (1/4) (single value)	All less than MDA	N/A
	Sr-90 36	5.00E-1	9.75E+0 (9/32) 7.58E-1 - 3.99E+1	Plant Intake 0.1 mi. E	3.99E+1 (1/4) (single value)	All less than MDA	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South CarolinaDocket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Bottom Sediment (pCi/gram dry)	Gamma  36  K-40	2.30E-1	5.79E+0 (26/32)  3.30E-1 - 2.31E+1	Ditch Behind  Visitor's Center 0.1 mi. SW  1.14E+1 (12/12)  2.58E+0 - 2.31E+1	6.84E-1 (2/4)  5.65E-1 - 8.03E-1	N/A
	Mn-54	2.30E-2	2.32E-1 (5/32)  9.80E-2 - 5.17E-1	Ditch Behind  Visitor's Center 0.1 mi. SW  2.66E-1 (4/12)  1.23E-1 - 5.17E-1	3.24E-2 (1/4)  (single value)	N/A
	Co-58	3.00E-1	1.61E-1 (4/32)  6.68E-2 - 2.81E-1	Ditch Behind  Visitor's Center 0.1 mi. SW  1.61E-1 (4/12)  6.68E-2 - 2.81E-1	All less than MDA	N/A
	Co-60	3.00E-2	3.88E+0 (19/32)  1.96E-2 - 1.68E+1	Ditch Behind  Visitor's Center 0.1 mi. SW  6.06E+0 (12/12)  4.52E-1 - 1.68E+1	All less than MDA	N/A
	Nb-95	2.40E-2	1.37E-1 (3/32)  5.70E-2 - 1.92E-1	Discharge Canal  Outfall 3.8 mi. N  1.92E-1 (1/4)  (single value)	All less than MDA	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

U. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Bottom Sediment (pCi/gram dry)	Gamma 36 Cs-134	2.60E-2	2.45E-1 (1/32) (single value)	Ditch Behind Visitor's Center 0.1 mi. SW 2.45E-1 (1/12) (single value)	All less than MDA	N/A
	Cs-137	2.80E-2	6.92E-1 (24/32) 2.22E-2 - 3.05E+0	Ditch Behind Visitor's Center 0.1 mi. SW 1.28E+0 (11/12) 1.32E-1 - 3.05E+0	1.15E-1 (3/4) 6.03E-2 - 1.45E-1	N/A
	Ca-144	1.99E-1	9.86E-2 (1/32) (single value)	Ditch Behind Visitor's Center 0.1 mi. SW 9.86E-2 (1/12) (single value)	All less than MDA	N/A
	Hg-203	2.70E-2	1.21E-1 (1/32) (single value)	Ditch Behind Visitor's Center 0.1 mi. SW 1.21E-1 (1/12) (single value)	All less than MDA	N/A



TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Fish Bone (pCi/gram dry) (Bottom Feeders)	Sr-89 4	2.00E+0	5.30E+0 (1/4) (single value)	Site Varies Within Lake Robinson	5.30E+0 (1/4) (single value)	No Control	N/A
	Sr-90 4	2.00E+0	1.06E+1 (2/4) 4.11E+0 - 1.71E+1	Site Varies Within Lake Robinson	1.06E+1 (2/4) 4.11E+0 - 1.71E+1	No Control	N/A
Fish Bone (pCi/gram dry) (Free Swimmers)	Sr-89 4	2.00E+0	5.89E+0 (1/4) (single value)	Site Varies Within Lake Robinson	5.89E+0 (1/4) (single value)	No Control	N/A
	Sr-90 4	2.00E+0	6.39E+0 (2/4) 6.32E+0 - 6.47E+0	Site Varies Within Lake Robinson	6.39E+0 (2/4) 6.32E+0 - 6.47E+0	No Control	N/A
Fish Flesh (pCi/gram dry) (Bottom Feeders)  (Free Swimmers)	Gross Beta 4	4.00E+0	1.41E+1 (4/4) 5.52E+0 - 1.97E+1	Site Varies Within Lake Robinson	1.41E+1 (4/4) 5.52E+0 - 1.97E+1	No Control	N/A
	Gross Beta 4	4.00E+0	1.18E+1 (4/4) 6.92E+0 - 2.18E+1	Site Varies Within Lake Robinson	1.18E+1 (4/4) 6.92E+0 - 2.18E+1	No Control	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Fish Flesh (pCi/gram dry) (Bottom Feeders)	Sr-89 4	2.00E-1	All less than MDA	All less than MDA	No Control	N/A
	Sr-90 4	1.00E-1	6.29E-1 (2/4) 1.09E-1 - 1.15E+0	Site Varies Within Lake Robinson 6.29E-1 (2/4) 1.09E-1 - 1.15E+0	No Control	N/A
	Sr-89 4	2.00E-1	2.08E-1 (1/4) (single value)	Site Varies Within Lake Robinson 2.08E-1 (1/4) (single value)	No Control	N/A
	Sr-90 4	1.00E-1	1.18E+0 (3/4) 1.05E-1 - 3.01E+0	Site Varies Within Lake Robinson 1.18E+0 (3/4) 1.05E-1 - 3.01E+0	No Control	N/A
	Gamma 4 K-40	3.00E-1	2.87E+1 (4/4) 6.71E+0 - 9.12E+1	Site Varies Within Lake Robinson 2.87E+1 (4/4) 6.71E+0 - 9.12E+1	No Control	N/A
	Cs-137	7.00E-2	3.61E-1 (4/4) 6.06E-2 - 6.27E-1	Site Varies Within Lake Robinson 3.61E-1 (4/4) 6.06E-2 - 6.27E-1	No Control	N/A
(Free Swimmers)						
(Bottom Feeders)						

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
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Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction Mean Range (2)		Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Fish Flesh (pCi/gram dry) (Free Swimmers)	Gamma 4	3.00E-1	2.37E+1 (4/4)	Site Varies Within	2.37E+1 (4/4)	No Control	N/A
	K-40		5.30E+0 - 7.54E+1	Lake Robinson	5.30E+0 - 7.54E+1		
Fodder & Feed Crop (pCi/gram dry)	Cs-137	7.00E-2	5.84E-1 (4/4) 6.44E-2 - 1.12E+0	Site Varies Within Lake Robinson	5.84E-1 (4/4) 6.44E-2 - 1.12E+0	No Control	N/A
	Gamma 3	6.00E-2	6.26E-1 (2/3)	Fink's Farm	8.53E-1 (1/3)	No Control	N/A
	Nb-95		3.99E-1 - 8.53E-1	7.0 mi. SE	(single value)		
	Zr-95	1.10E-1	4.23E-1 (1/3) (single value)	Fink's Farm 7.0 mi. SE	4.23E-1 (1/3) (single value)	No Control	N/A
	Ru-103	5.50E-2	7.69E-2 (1/3) (single value)	Fink's Farm 7.0 mi. SE	7.69E-2 (1/3) (single value)	No Control	N/A
	Cs-137	7.00E-2	9.71E-2 (3/3) 5.44E-2 - 1.39E-1	Lyndale Farm 11.3 mi. SSW	9.80E-2 (1/3) (single value)	No Control	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Fodder & Feed Crop (pCi/gram dry)	Gamma 3 Ce-141	6.50E-2	2.06E-1 (1/3) (single value)	Fink's Farm 7.0 mi. SE	2.06E-1 (1/3) (single value)	No Control	N/A
	Ce-144	2.65E-1	6.04E-1 (2/3) 3.57E-1 - 8.51E-1	Fink's Farm 7.0 mi. SE	8.51E-1 (1/3) (single value)	No Control	N/A
Food Crop (pCi/gram dry) (6)	Gamma 5 Nb-95	6.00E-2	9.53E-2 (2/5) 2.86E-2 - 1.62E-1	Isgett's Farm 5.2 mi. NE	9.53E-2 (2/2) 2.86E-2 - 1.62E-1	No Control	N/A
	Cs-137	7.00E-2	1.75E-1 (4/5) 4.63E-2 - 4.91E-1	Howle Farm 4.0 mi. E	2.94E-1 (2/2) 9.77E-2 - 4.91E-1	No Control	N/A
	Ce-144	2.65E-1	2.65E-1 (1/5) (single value)	Isgett's Farm 5.2 mi. NE	2.65E-1 (1/2) (single value)	No Control	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Ground Water (pCi/liter)	Gross Alpha		8.22E-1 (9/12)	Hartsville	1.18E+0 (3/4)		
	12	2.00E-1	4.50E-1 - 1.55E+0	5.8 mi. ESE	5.58E-1 - 1.55E+0	No Control	N/A
	Gross Beta		1.34E+0 (6/12)	Unit 1 Well Near			
	12	8.20E-1	8.61E-1 - 1.82E+0	Site Entrance	1.57E+0 (2/4)		
				0.1 mi. SSE	1.33E+0 - 1.82E+0	No Control	N/A
	Sr-89						
	12	5.00E+0	All less than MDA	All less than MDA		No Control	N/A
	Sr-90						
	12	1.20E+0	All less than MDA	All less than MDA		No Control	N/A
	Tritium						
	12	1.20E+2	All less than MDA	All less than MDA		No Control	N/A
	Gamma						
	12	N/A	All less than MDA	All less than MDA		No Control	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
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Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Milk (pCi/liter)	I-131 24	1.50E-1	1.97E-1 (1/24) (single value)	Fink's Farm 7.0 mi. SE	1.97E-1 (1/12) (single value)	No Control	N/A
	Sr-89 24	3.00E+0	1.31E+1 (3/24) 6.79E+0 - 1.73E+1	Fink's Farm 7.0 mi. SE	1.62E+1 (2/12) 1.51E+1 - 1.73E+1	No Control	N/A
	Sr-90 24	2.00E+0	5.97E+0 (7/24) 2.68E+0 - 1.42E+1	Lyndale Farm 11.3 mi. SSW	7.82E+0 (4/12) 2.68E+0 - 1.42E+1	No Control	N/A
	Gamma 24 K-40	3.00E+2	1.13E+3 (24/24) 8.39E+2 - 1.72E+3	Fink's Farm 7.0 mi. SE	1.23E+3 (12/12) 1.02E+3 - 1.72E+3	No Control	N/A
	Cs-137	9.00E+0	1.16E+1 (7/24) 5.17E+0 - 2.07E+1	Fink's Farm 7.0 mi. SE	1.35E+1 (2/12) 6.26E+0 - 2.07E+1	No Control	N/A
Soil (pCi/gram dry)	Gross Beta 6	9.00E-2	1.15E+0 (6/6) 3.81E-1 - 1.77E+0	Dam - West End 0.4 mi. E	1.77E+0 (1/1) (single value)	No Control	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Soil  (pCi/gram dry)	Sr-89  4	2.70E-1	All less than MDA	All less than MDA	No Control	N/A
	Sr-90  4	1.30E-1	All less than MDA	All less than MDA	No Control	N/A
	Gamma  8  K-40	2.30E-1	4.56E+0 (7/8) 2.36E-1 - 2.53E+1	Ash Pond 0.25 mi. WNW 1.35E+1 (2/2) 1.67E+0 - 2.53E+1	No Control	N/A
	Co-60	3.00E-2	4.96E+0 (2/8) 6.03E-1 - 9.32E+0	Ash Pond 0.25 mi. WNW 4.96E+0 (2/2) 6.03E-1 - 9.32E+0	No Control	N/A
	Nb-95	2.40E-2	6.20E-2 (1/8) (single value)	Ash Pond 0.25 mi. WNW 6.20E-2 (1/2) (single value)	No Control	N/A
	Cs-137	2.80E-2	3.57E-1 (7/8) 3.96E-2 - 1.20E+0	Dam - West End 0.4 mi. E 1.20E+0 (1/2) (single value)	No Control	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
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Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Surface Water (pCi/liter)  (Sampled Weekly)	Gross Alpha 310 (7)	2.00E-1	1.14E+0 (164/258) 3.52E-1 - 3.14E+0	Prestwood Lake 4.9 mi. ESE	1.40E+0 (40/52) 3.97E-1 - 3.14E+0	1.01E+0 (26/52) 4.32E-1 - 2.25E+0	N/A
	Gross Beta 310 (7)	8.20E-1	2.23E+0 (188/258) 7.24E-1 - 1.35E+1	Prestwood Lake 4.9 mi. ESE	2.48E+0 (33/52) 7.24E-1 - 5.21E+0	1.68E+0 (33/52) 6.95E-1 - 3.28E+0	N/A
	Tritium 310 (7)	3.50E+2	1.56E+3 (258/258) 1.88E+2 - 4.81E+3	Discharge Canal Outfall 3.8 mi. N	1.89E+3 (52/52) 6.34E+2 - 4.81E+3	3.23E+2 (6/52) 1.02E+2 - 4.62E+2	N/A
(Monthly Composite)	Gross Alpha 60	2.00E-1	1.00E+0 (30/48) 5.46E-1 - 2.25E+0	Prestwood Lake 4.9 mi. ESE	1.19E+0 (10/12) 7.67E-1 - 2.25E+0	6.33E-1 (4/12) 4.16E-1 - 7.62E-1	N/A
	Gross Beta 60	8.20E-1	2.09E+0 (35/48) 9.24E-1 - 3.42E+0	Prestwood Lake 4.9 mi. ESE	2.53E+0 (6/12) 2.04E+0 - 3.42E+0	1.71E+0 (7/12) 7.90E-1 - 2.44E+0	N/A
	Sr-89 60	5.00E+0	8.38E+0 (1/48) (single value)	Discharge Canal Outfall 3.8 mi. N	8.38E+0 (1/12) (single value)	All less than MDA	N/A



TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
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Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Surface Water (pCi/liter)  (Monthly Composite)	Sr-90  60	5.00E+0	6.90E+0 (1/48) (single value)	Plant Intake  0.1 mi. E	6.90E+0 (1/12) (single value)	All less than MDA	N/A
	Tritium  60	3.50E+2	1.55E+3 (48/48) 6.58E+2 - 2.78E+3	Discharge Canal  Outfall  3.8 mi. N	1.86E+3 (12/12)  7.36E+2 - 2.78E+3	3.31E+2 (1/12) (single value)	N/A
	Gamma 71(8)  Co-58	7.00E+0	3.64E+0 (1/59) (single value)	Black Creek at  Road 1623  0.6 mi. ESE	3.64E+0 (1/12) (single value)	All less than MDA	N/A
	Ce-141  20	1.00E+1	4.18E+0 (1/59) (single value)	Ash Pond  0.25 mi. WNW	4.18E+0 (1/11) (single value)	All less than MDA	N/A
Surface Water (pCi/liter)  (Quarterly Composite)	Gross Alpha  20	2.00E-1	8.04E-1 (9/16) 5.54E-1 - 1.19E+0	Prestwood Lake  4.9 mi. ESE	9.58E-1 (2/4) 7.27E-1 - 1.19E+0	1.86E+0 (1/4) (single value)	N/A
	Gross Beta  20	8.20E-1	1.85E+0 (8/16) 1.59E+0 - 2.28E+0	Black Creek at  Road 1623  0.6 mi. ESE	2.14E+0 (2/4) 2.01E+0 - 2.28E+0	1.66E+0 (2/4) 1.48E+0 - 1.85E+0	N/A

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## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South CarolinaDocket Numbers - 50-261  
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Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Surface Water (pCi/liter) (Quarterly Composite)	Tritium 60	3.50E+2	1.63E+3 (16/16) 5.83E+2 - 2.61E+3	Discharge Canal Outfall 3.8 mi. N 1.84E+3 (4/4) 1.06E+3 - 2.61E+3	All less than MDA	N/A
Surface Water (pCi/liter)	Gamma 52	8.00E-3	1.41E-2 (4/52) 8.73E-3 - 1.69E-2	Plant Intake 0.1 mi. E 1.41E-2 (4/52) 8.73E-3 - 1.69E-2	No Control	N/A
(Ion Exchange Resin)	Mn-54	9.00E-3	2.13E-2 (5/52) 9.30E-3 - 4.60E-2	Plant Intake 0.1 mi. E 2.13E-2 (5/52) 9.30E-3 - 4.60E-2	No Control	N/A
	Co-58	9.00E-3	7.02E-2 (17/52) 1.63E-2 - 5.06E-1	Plant Intake 0.1 mi. E 7.02E-2 (17/52) 1.63E-2 - 5.06E-1	No Control	N/A
	Co-60	7.00E-3	8.91E-2 (10/52) 8.67E-3 - 5.80E-1	Plant Intake 0.1 mi. E 8.91E-2 (10/52) 8.67E-3 - 5.80E-1	No Control	N/A
	Nb-95	1.50E-2	1.73E-1 (4/52) 2.72E-2 - 5.70E-1	Plant Intake 0.1 mi. E 1.73E-1 (4/52) 2.72E-2 - 5.70E-1	No Control	N/A
	Zr-95					

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## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

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Darlington County, South Carolina

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Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Surface Water (pCi/liter)  (Ion Exchange Resin)	Gamma  52  Ru-103	8.00E-3	8.06E-2 (25/52) 2.16E-2 - 8.39E-1	Plant Intake 0.1 mi. E	8.06E-2 (25/52) 2.16E-2 - 8.39E-1	No Control	N/A
	Cs-134	9.00E-3	2.91E-2 (1/52) (single value)	Plant Intake 0.1 mi. E	2.91E-2 (1/52) (single value)	No Control	N/A
	Cs-137	9.00E-3	1.40E-1 (50/52) 1.54E-2 - 1.22E+0	Plant Intake 0.1 mi. E	1.40E-1 (50/52) 1.54E-2 - 1.22E+0	No Control	N/A
	Ce-141	1.10E-2	1.24E-1 (6/52) 1.43E-2 - 6.41E-1	Plant Intake 0.1 mi. E	1.24E-1 (6/52) 1.43E-2 - 6.41E-1	No Control	N/A
	Ce-144	5.00E-2	7.01E-2 (2/52) 6.45E-2 - 7.58E-2	Plant Intake 0.1 mi. E	7.01E-2 (2/52) 6.45E-2 - 7.58E-2	No Control	N/A
Surface Water (pCi/liter) (Glasswool)	Gamma  52  Co-60	9.00E-3	6.93E-2 (1/52) (single value)	Plant Intake 0.1 mi. E	6.93E-2 (1/52) (single value)	No Control	N/A

TABLE 2-1

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

H. B. Robinson Steam Electric Plant  
Darlington County, South Carolina

Docket Numbers - 50-261  
Calendar Year 1981

Medium or Pathway Sampled or Measured (Unit of Measure- ment)	Type & Total # of Measurements Performed	Minimum Detectable Activity (MDA) (1)	All Indicator Locations (2) Mean Range	Location w/Highest Annual Mean Name Distance & Direction	Mean Range (2)	Control Locations Mean Range (2)	# of Non- routine Reported Measure- ments (3)
Surface Water (pCi/liter)	Gamma 52 Nb-95	7.00E-3	3.01E-2 (3/52) 2.24E-2 - 3.43E-2	Plant Intake 0.1 mi. E	3.01E-2 (3/52) 2.24E-2 - 3.43E-2	No Control	N/A
(Glasswool)	Zr-95	1.50E-2	1.86E-1 (1/52) (single value)	Plant Intake 0.1 mi. E	1.86E-1 (1/52) (single value)	No Control	N/A
TLD (Millirem per wk)	TLD 264	3.00E-1	1.67E+0 (248/252) 7.80E-1 - 5.11E+0	Robinson Unit 1 (On Site)	3.88E+0 (12/12) 1.92E+0 - 5.11E+0	1.47E+0 (12/12) 9.90E-1 - 2.19E+0	N/A

## FOOTNOTES:

1. Calculated based on three standard deviations above background, using typical sample size in a given counting time. Due to counting statistics and varying volumes, occasionally lower minimum detectable activities are achieved.
2. Mean and range are based on detectable measurements only. The fractions of detectable measurements at specific locations are indicated in parenthesis.
3. Measurements in excess, at the 99.5% confidence level of ten times the control station value or ten times the minimum detectable activity (MDA)--whichever is larger. Present Environmental Technical Specifications do not require such reports.
4. Air particulate samples were collected weekly for a possible 364 samples. However, the sample collected 5-4-81, at Station 9, only had a volume of 4.4 m<sup>3</sup>. Analysis of this sample would have given erroneously high concentrations, and therefore no analysis was performed for gross alpha and gross beta.
5. There are a possible 32 gross beta, strontium, and gamma analyses; however, there was no sample media available for the month of January at Station 33 due to ditch burn off for cleaning.
6. Tobacco samples (cured and uncured) are considered to be food crops.
7. Surface water is sampled twice a week at Station 11. There was a total of 102 samples collected at Station 11 during 1981.
8. There was a possible total of 72 gamma scans on surface water; however, there was no sample available at Station 50 for the month of April due to Unit 1 20-year outage which did not permit water discharges to the ash pond.

### 3.0 INTERPRETATION AND CONCLUSIONS

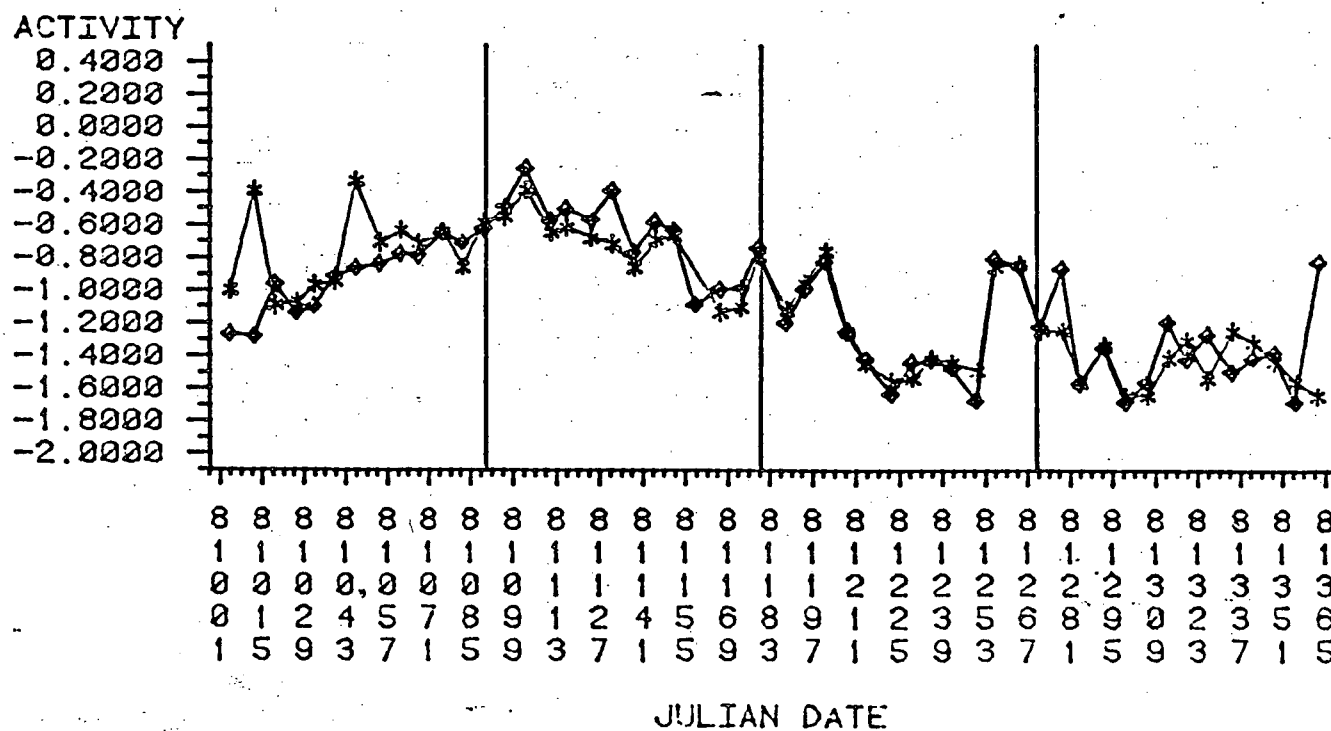
#### 3.1 Air Samples

Air samples collected during 1981 contained no unusual levels of radioactivity. Gross alpha concentrations were measurable in 288 of 311 samples, averaging  $7.50\text{E-}3$  pCi/m<sup>3</sup>, compared to the control station average of  $7.01\text{E-}3$  pCi/m<sup>3</sup>. Measurable gross beta concentrations were observed in 310 of 311 samples, averaging  $1.27\text{E-}1$  pCi/m<sup>3</sup>, compared to the control station average of  $1.30\text{E-}1$  pCi/m<sup>3</sup>. These levels are consistent with preoperational data obtained for the H. B. Robinson Plant. A graph of the individual air sampling stations versus the control station is included as Figures 3-1 through 3-6 to demonstrate that all stations were comparable to the control station, with no large deviation at any single location.

The monthly composite gamma and radiostrontium analyses for air particulate samples revealed several radionuclides present during 1981 as summarized in Table 3-1.

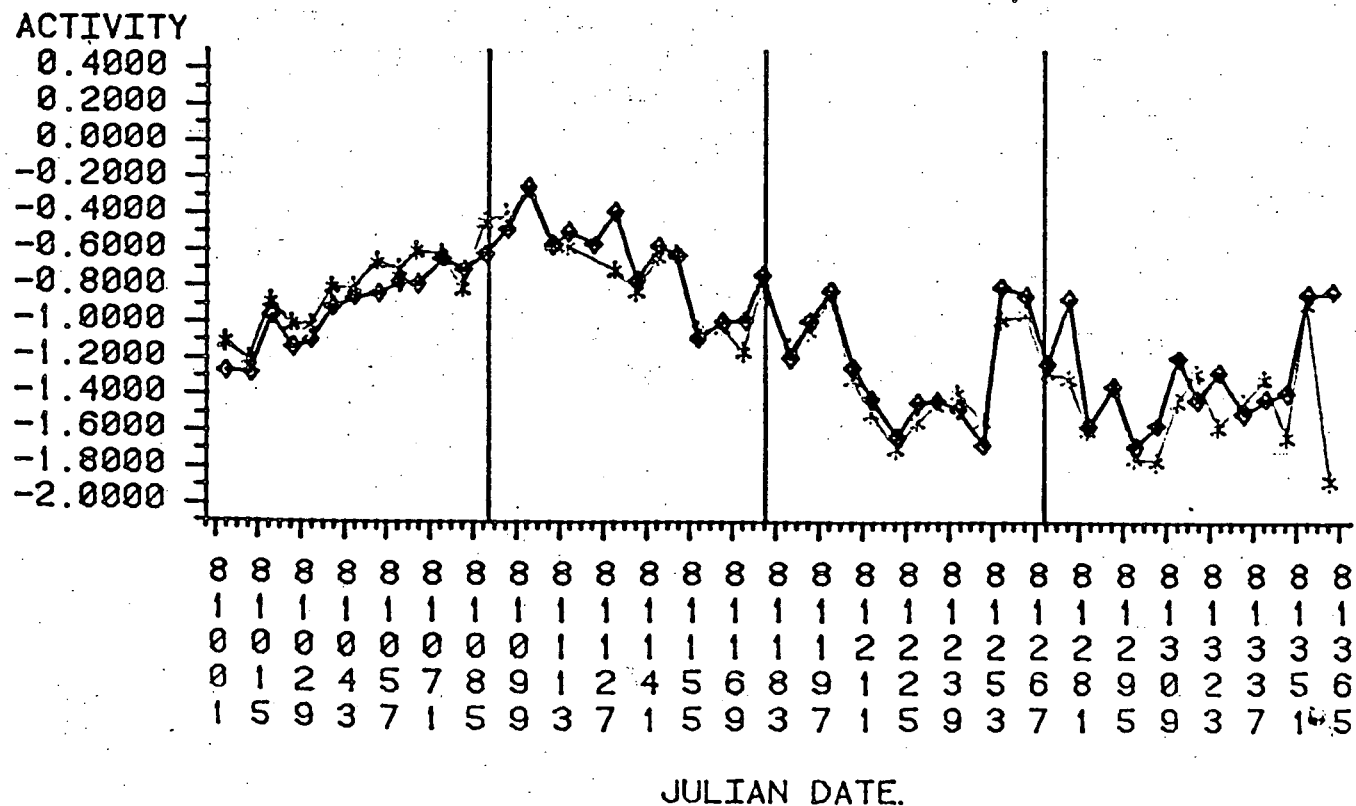
# CP&L ENVIRONMENTAL MONITORING SYSTEM

PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS  
PLOT OF CONTROL ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS  
PLANT=HBR POINT=02



# CP&L ENVIRONMENTAL MONITORING SYSTEM

PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS  
PLOT OF CONTROL ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS  
PLANT=HBR POINT=09





# CP&L ENVIRONMENTAL MONITORING SYSTEM

PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS  
PLOT OF CONTROL ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS  
PLANT=HBR POINT=17



# CP&L ENVIRONMENTAL MONITORING SYSTEM

PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS  
PLOT OF CONTROL ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS  
PLANT=HBR POINT=34



Figure 3-5

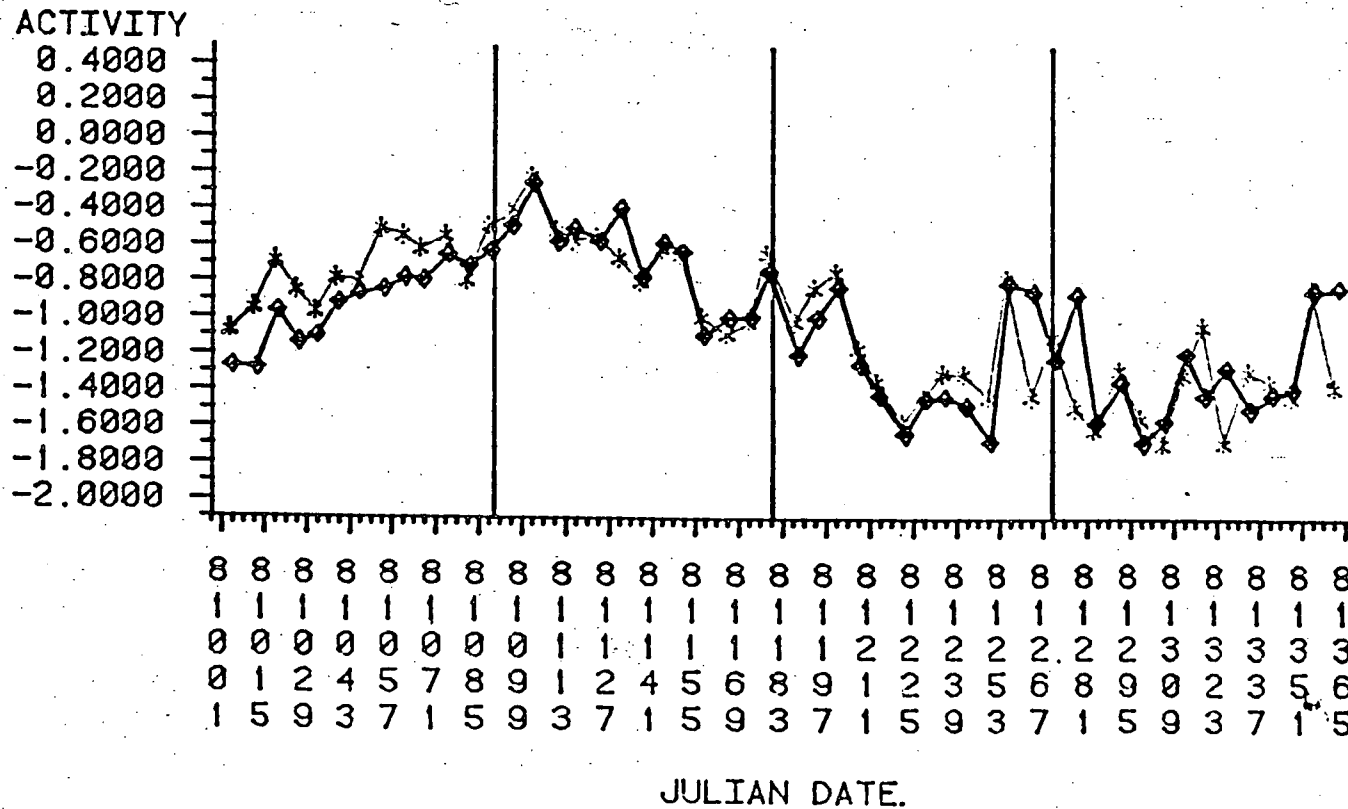
**CP&L ENVIRONMENTAL MONITORING SYSTEM**

GROSS BETA  
AIR PARTICULATE  
(PICURIES PER CUBIC METER)  
COMMON LOGARITHM PLOT

PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS

PLOT OF CONTROL ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS

PLANT=HBR      POINT=35



# CP&L ENVIRONMENTAL MONITORING SYSTEM

PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS  
PLOT OF CONTROL ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS  
PLANT=HBR POINT=36

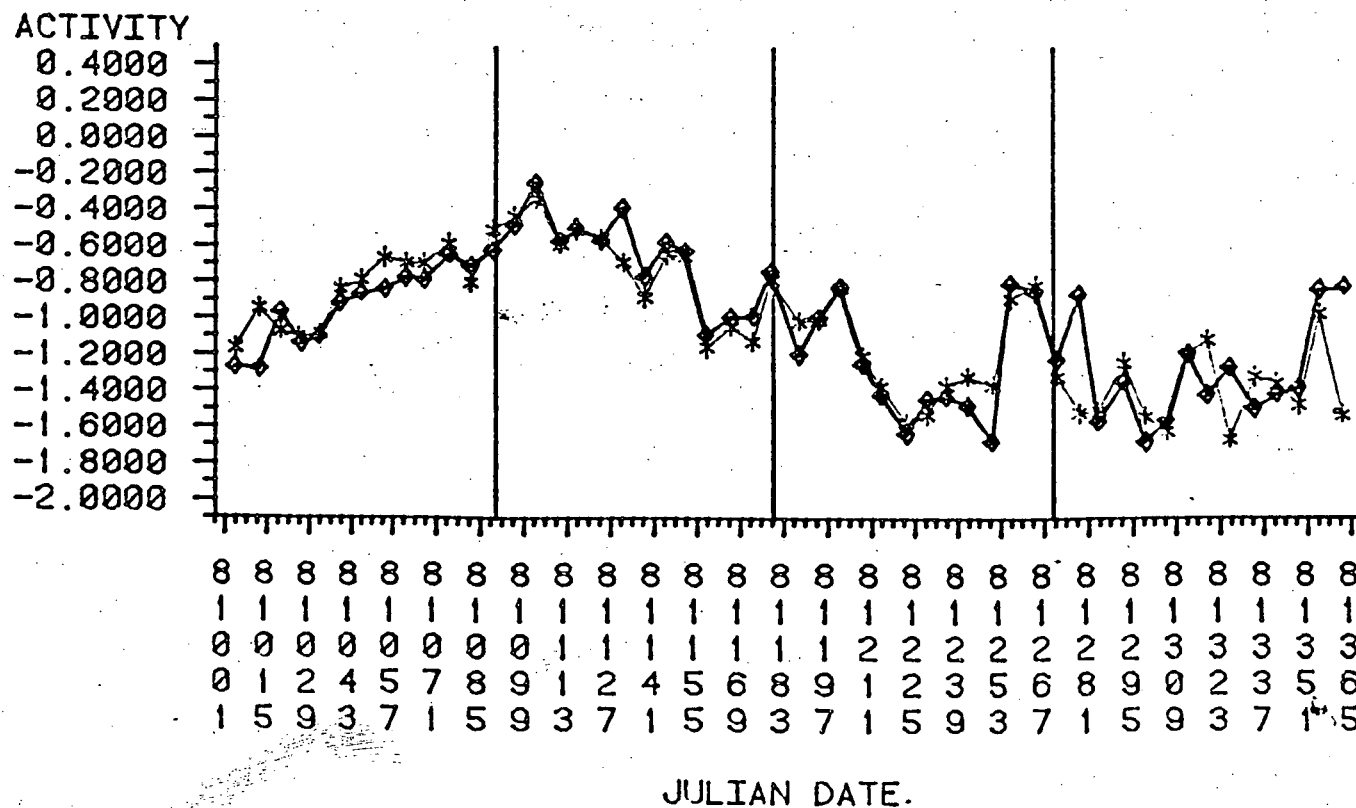


TABLE 3-1

Average Concentration and Occurrence Fraction of  
Radionuclides Observed in Monthly Composited  
Air Particulate Samples During 1981

<u>Radionuclide</u>	<u>Indicator Stations</u> <u>(pCi/m<sup>3</sup>)</u>	<u>Control Stations</u> <u>(pCi/m<sup>3</sup>)</u>
Sr-89	1.37E-2 (40/72)	1.15E-2 (6/12)
Sr-90	3.66E-3 (18/72)	1.85E-3 (2/12)
Mn-54	3.01E-3 (2/72)	All less than MDA
Nb-95	5.89E-2 (31/72)	5.30E-2 (6/12)
Zr-95	3.84E-2 (41/72)	3.95E-2 (6/12)
Ru-103	2.01E-2 (36/72)	1.83E-2 (6/12)
Ru-106	3.11E-2 (3/72)	4.27E-2 (1/12)
Cs-137	3.07E-3 (15/72)	5.64E-3 (1/12)
Ce-141	1.44E-2 (33/72)	1.15E-2 (6/12)
Ce-144	3.34E-2 (37/72)	3.10E-2 (6/12)

The widespread distribution of this radioactivity has been observed at all sampling stations as well as other environmental monitoring sites in nearby states, with the exception of Mn-54. This factor combined with the absence of radionuclides present in routine plant releases indicates that fallout rather than the H. B. Robinson Plant is the source. The sporadic appearance of Mn-54 at concentrations below typical minimum detectable activity do not clearly indicate the Robinson Plant as the source.

### 3.2 Aquatic Vegetation and Bottom Sediment

Aquatic vegetation and bottom sediment samples are taken quarterly at five locations to monitor the expected effluent path from the Robinson Plant. An additional bottom sediment sample is taken quarterly at the plant intake. Monthly bottom sediment and aquatic vegetation samples are taken from the open ditch (Station 33) near the Visitors Center in order to monitor any untreated liquid effluent from those locations where only low-level activity concentrations are expected.

Gamma analyses revealed the continued presence of several radionuclides predominant in plant liquid effluent as well as several short-lived fission products attributed to old debris from nuclear testing. These radionuclides are summarized in Table 3-2.

TABLE 3-2

Average Concentration (pCi/g dry) and Occurrence Fraction  
of Radionuclides in Bottom Sediment and Aquatic Vegetation

BOTTOM SEDIMENT

<u>Isotope</u>	<u>Annual Average (pCi/g)</u>	<u>Location with Highest Annual Mean</u>
Mn-54	.232 (5/32)	SD-33
Co-58	.161 (4/32)	SD-33
Co-60	3.88 (19/32)	SD-33
Sr-89	4.44 (5/32)	SD-11
Sr-90	9.75 (9/32)	SD-5
Nb-95	.137 (3/32)	SD-8
Cs-134	.245 (1/32)	SD-33
Cs-137	.692 (24/32)	SD-33
Ce-144	.0986 (1/32)	SD-33
Hg-203	.121 (1/32)	SD-33

AQUATIC VEGETATION

<u>Isotope</u>	<u>Annual Average (pCi/g)</u>	<u>Location with Highest Annual Mean</u>
Mn-54	.207 (12/27)	AV-8
Co-58	.490 (4/27)	AV-33
Co-60	2.29 (13/27)	AV-33
Sr-89	1.08 (6/27)	AV-33
Sr-90	.195 (8/27)	AV-8
Nb-95	1.41 (15/27)	AV-32
Zr-95	.988 (15/27)	AV-32
Ru-103	.347 (15/27)	AV-8
Ru-106	.822 (1/27)	AV-33
Cs-134	.636 (1/27)	AV-33
Cs-137	1.64 (25/27)	AV-21
Ce-139	.121 (1/27)	AV-33
Ce-141	.358 (11/27)	AV-32
Ce-144	2.98 (19/27)	AV-33

Concentrations observed were predominant at Station 33. This location is within the confines of the plant and discharges just below the spillway where the general public has minimum access. The samples collected at Station 11, located approximately 200 yards downstream from the discharge point of Station 33, showed no significant increases in comparison to previous data. Bottom sediments and aquatic vegetation are not consumed by man; they are, however, useful for documentation of trends in plant effluent. Review of past data indicates that there is no continuous increase in the concentration observed at this site.

### 3.3 Fish

Fish samples are analyzed quarterly for radiostrontium and gamma emitting radionuclides. A single incidence of Sr-89 was observed in free swimmers during the fourth quarter of 1981. The activity detected was  $2.08\text{E}-1$  pCi/gram dry which was slightly above the minimum detectable activity of  $2.00\text{E}-1$  pCi/gram dry. The concomitant dose to man would be insignificant ( $<0.001$  mRem/yr). Strontium-90 and cesium-137 continued to manifest itself (see Table 3-3). These average concentrations are similar to previous years.

TABLE 3-3  
Average Concentration of Radionuclides in Fish Flesh  
(pCi/gram dry)

<u>Radionuclide</u>	<u>Bottom Feeders</u>	<u>Free Swimmers</u>
Sr-90	$6.29\text{E}-1$ (2/4)	$1.18\text{E}+0$ (3/4)
Cs-137	$3.61\text{E}-1$ (4/4)	$5.84\text{E}-1$ (4/4)

From April 28, thru May 5, 1981, fish samples were collected from seven ponds unrelated to Lake Robinson and considered as control samples. The Cs-137 and Sr-90 average concentrations on the edible portions of these fish were  $1.59$  pCi/g (dry) and  $0.49$  pCi/g (dry), respectively. Using a t-test at 99.5% confidence level, the activities observed in Lake Robinson fish were demonstrated not to be significantly different from the activities in control samples. The source for these fission products is not attributed to the H. B. Robinson Plant. The 173 square-mile Robinson watershed provides a mechanism for concentrating fallout from weapons testing and other outside fission product sources in the lake.

The annual dose from an adult's fish consumption for the entire year, based on the assumptions of Regulatory Guide 1.109 and using the activities released thru liquid releases is well below the estimated dose given in the final environmental statement (see Table 3-4).

TABLE 3-4

Estimated Adult Doses\* from the Consumption of Fish (1981)  
and Final Environmental Statement (FES) Predictions

	*1981 Dose <u>mRem/yr</u>	FES <u>mRem/yr</u>
Bone	2.00E-7	1.4
Liver	1.69E-7	-
Kidney	8.01E-8	-
Lung	3.81E-8	-
GI-LLI	1.10E-6	0.23
Total Body	1.60E-7	1.9

\*Calculated using liquid effluent release data

### 3.4 Vegetation

Cattle feed (FO) and locally grown food crops (FC) were sampled as available during the year and analyzed for gamma emitting radionuclides. The radionuclides detected are summarized in Table 3-5.

TABLE 3-5

Average Concentration pCi/g dry) and Occurrence  
Fraction of Radionuclides in Cattle Feed and Food Crops

#### CATTLE FEED (FO)

<u>Isotope</u>	<u>Annual Avg. (pCi/g)</u>	<u>Occurrence/Fraction</u>
Nb-95	.626	2/3
Zr-95	.423	1/3
Ru-103	.0769	1/3
Cs-137	.0971	3/3
Ce-141	.206	1/3
Ce-144	.604	2/3

#### FOOD CROP (FC)

<u>Isotope</u>	<u>Annual Avg. (pCi/g)</u>	<u>Occurrence/Fraction</u>
Nb-95*	.0953	2/5
Cs-137	.175	4/5
Ce-144*	.265	1/5

\*Tobacco sample

These isotopes are typical of fallout material and are not attributed to the Robinson operation.



### 3.5 Groundwater

Quarterly groundwater samples for all three sampling stations showed no indication of plant contributed radioactivity.

Gross alpha activity was observed in 9 of 12 samples averaging  $8.22\text{E}-1$  pCi/l. Gross beta activity was detected in 6 of 12 samples averaging  $1.34\text{E}+0$  pCi/l. This average is comparable to data obtained during preoperational surveillance. Tritium and radiostrontium analyses revealed no measurable activity. Gamma analyses revealed only naturally occurring radionuclides.

### 3.6 Milk Samples

Monthly milk samples were taken at two locations and analyzed for radioiodine, radiostrontium, and gamma emitting radionuclides.

Radiochemical determination of I-131 yielded measurable activity in only 1 of 24 samples analyzed. The activity detected was just slightly above the minimum detectable activity for milk samples. The absence of any iodine detected at other sample locations during this time period renders this data questionable and may be the result of low-level counting statistics.

Radiostrontium analyses of milk revealed Sr-89 in 3 of 24 samples analyzed averaging  $1.31\text{E}+1$  pCi/l. Strontium-90 was detected in 7 of 24 samples averaging  $5.97\text{E}+0$  pCi/l. These concentrations are in agreement with averages from previous years and do not indicate that the Robinson operation affected the milk pathway to man during 1981.

Gamma isotopic analyses detected Cs-137 in 7 of the 24 samples averaging  $1.16\text{E}+1$  pCi/l. These levels of Cs-137 in milk are representative of data obtained over the last several years and reflect the accumulation of debris from old and recent nuclear weapons testing.

### 3.7 Soil Samples

Ten sampling locations are sampled every three years. Two sample locations are sampled semiannually on a rotating basis. During 1981 Station 11 (Black Creek at Road 1623), Station 19 (East Shore of Lake), Station 35 (Dam-West End), and Station 36 (Florence) were sampled and analyzed for gross beta, strontium, and gamma emitters.

Station 49 (East Shore of Lake at Boat Launch) is sampled semiannually as shoreline sediment and is analyzed for gross beta and gamma emitters. In addition, Station 50 (Ash Pond) was added to the sampling program in 1981. This station is sampled semiannually and analyzed for gamma emitting radionuclides. Station 50 is located within the site boundary and was added to the environmental program as a directive from the Company's Nuclear Safety and Research Department.

Gross beta activities were detected in 6 of 6 samples analyzed averaging  $1.15\text{E}+0$  pCi/g. This is in agreement with gross beta activities observed on the same sample type during preoperational surveillance. No detectable strontium was observed in any of the samples analyzed. Gamma analyses revealed cesium-137 in 7 of 8 samples analyzed. All concentrations observed were comparable to previous data reported for the area.

Low levels of Co-60 and Nb-95 were detected at Station 50. Since this is a new station, there is no previous data with which to compare the activities measured. The results are comparable to those observed in bottom sediment sampled at Station 33 which is also located on site.

### 3.8 Surface Water

Gross alpha and gross beta activities in weekly surface water samples were generally consistent with previous surveillance data. Gross alpha concentrations were measurable in 164 of 258 samples analyzed. The average of  $1.14\text{E}+0$  pCi/l was comparable to the control station average of  $1.01\text{E}+0$  pCi/l. Measurable gross beta concentrations were reported in 188 of 258 samples averaging  $2.23\text{E}+0$  pCi/l. These gross beta activities are comparable to the average of  $4.08\text{E}+0$  pCi/l reported during preoperational surveillance.

These activities were consistent at all stations, with no one station showing significant deviation as shown in Figures 3-7 through 3-10.

Monthly composites of the weekly samples showed measurable gross alpha and beta activities in 30 of 48 and 35 of 48 cases, respectively. The average concentration for gross alpha and beta in these samples was  $1.00\text{E}+0$  pCi/l and  $2.09\text{E}+0$  pCi/l, respectively. These compare favorably with the control station averages of  $6.33\text{E}-1$  pCi/l and  $1.71\text{E}+0$  pCi/l for gross alpha and gross beta, respectively.

Quarterly composites of the monthly composites indicated less measurable alpha and beta activities than the monthly samples. Gross alpha activity was detected in 9 of 16 samples, averaging  $8.04\text{E}-1$  pCi/l compared to  $1.86\text{E}+0$  pCi/l at the control station. Measurable gross beta activity was observed in 8 of 16 samples averaging  $1.85\text{E}+0$  pCi/l. This is comparable to  $1.66\text{E}+0$  pCi/l detected at the control location. The decrease in measurable activities appears to be the result of radioactive decay during storage combined with potential plating on container walls.

Tritium activity concentrations were determined in weekly samples, monthly composites, and quarterly composites. The tritium measured in the composites was consistent with that reported in samples from which the composites were made. All activities are comparable to previous data revealing no significant increase in activity. The tritium data are summarized by station below:

Tritium Concentrations (pCi/l)				
<u>Weekly Samples</u>	<u>SW-5</u>	<u>SW-8</u>	<u>SW-11</u>	<u>SW-32</u>
Average	1620	1890	1570	1140
Range	520-3900	634-4810	188-3100	498-2060
<u>Monthly Composite</u>				
Average	1560	1860	1630	1150
Range	965-2140	736-2780	813-2250	658-1670
<u>Quarterly Composite</u>				
Average	1660	1830	1820	1220
Range	921-2170	1060-2610	793-2490	583-1550

Specific isotopic analyses of monthly surface water composites were accomplished through high resolution gamma spectrometry. In 69 of 71 samples analyzed, no fission or activation products were measurable. The two exceptions are given below:

	<u><math>^{58}\text{Co}</math></u>	<u>pCi/l</u>
June Composite	SW-11	$3.64 \pm 1.88$
	<u><math>^{141}\text{Ce}</math></u>	
October Composite	SW-50	$4.18 \pm 1.42$

The sporadic appearance of these isotopes in single isolated cases do not clearly indicate the Robinson Plant as the source. The activities observed are below the typical minimum detectable activity associated with the respective isotopes and therefore pose no harmful effect on the environment.

Radiostrontium analyses of monthly composited surface water samples revealed a single incidence of Sr-89, 90, detected during September. Strontium-89 was detected at a concentration of 8.38 pCi/l at Station 8. Strontium-90 was quantified during the same period at Station 5 at a concentration of 6.90 pCi/l. The sporadic appearance of this particular isotope in surface water does not clearly indicate the Robinson Plant as the source.

The measurement of very low levels of fission and activation products in lake water was also performed during the year. Weekly samples on the order of several thousand liters were concentrated on mixed bed ion exchange resin (for ion collection) and glasswool (for suspended particulate collection). Thus, the analytical sensitivity for gamma isotopic analyses was improved sufficiently to allow measurement of many fission and activation products. The radionuclides measured by this method are listed in Table 3-6.

TABLE 3-6  
Ion Exchange Resin  
(pCi/l)

<u>Radionuclide</u>	<u>Occurence</u>	<u>Average (pCi/l)</u>	<u>High pCi/l</u>	<u>Low pCi/l</u>
Mn-54	4/52	1.42E-2	8.73E-3	1.69E-2
Co-58	5/52	2.13E-2	9.30E-3	4.60E-2
Co-60	17/52	7.02E-2	1.63E-2	5.06E-1
Nb-95	10/52	8.91E-2	8.67E-3	5.80E-1
Zr-95	4/52	1.73E-1	2.72E-2	5.70E-1
Ru-103	25/52	8.06E-2	2.16E-2	8.39E-1
Cs-134	1/52	2.91E-2	(Single value)	
Cs-137	50/52	1.40E-1	1.54E-2	1.22E+0
Ce-141	6/52	1.24E-1	1.43E-2	6.41E-1
Ce-144	2/52	7.01E-2	6.45E-2	7.58E-2

Comparison of radionuclide concentrations collected on the resin and glasswool indicates a much greater fraction of the radionuclides appear in ionic form rather than as suspended particulates.

**CP&L ENVIRONMENTAL MONITORING SYSTEM**

PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS  
PLOT OF CONTROL STATION ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS  
PLANT=HBR POINT=05

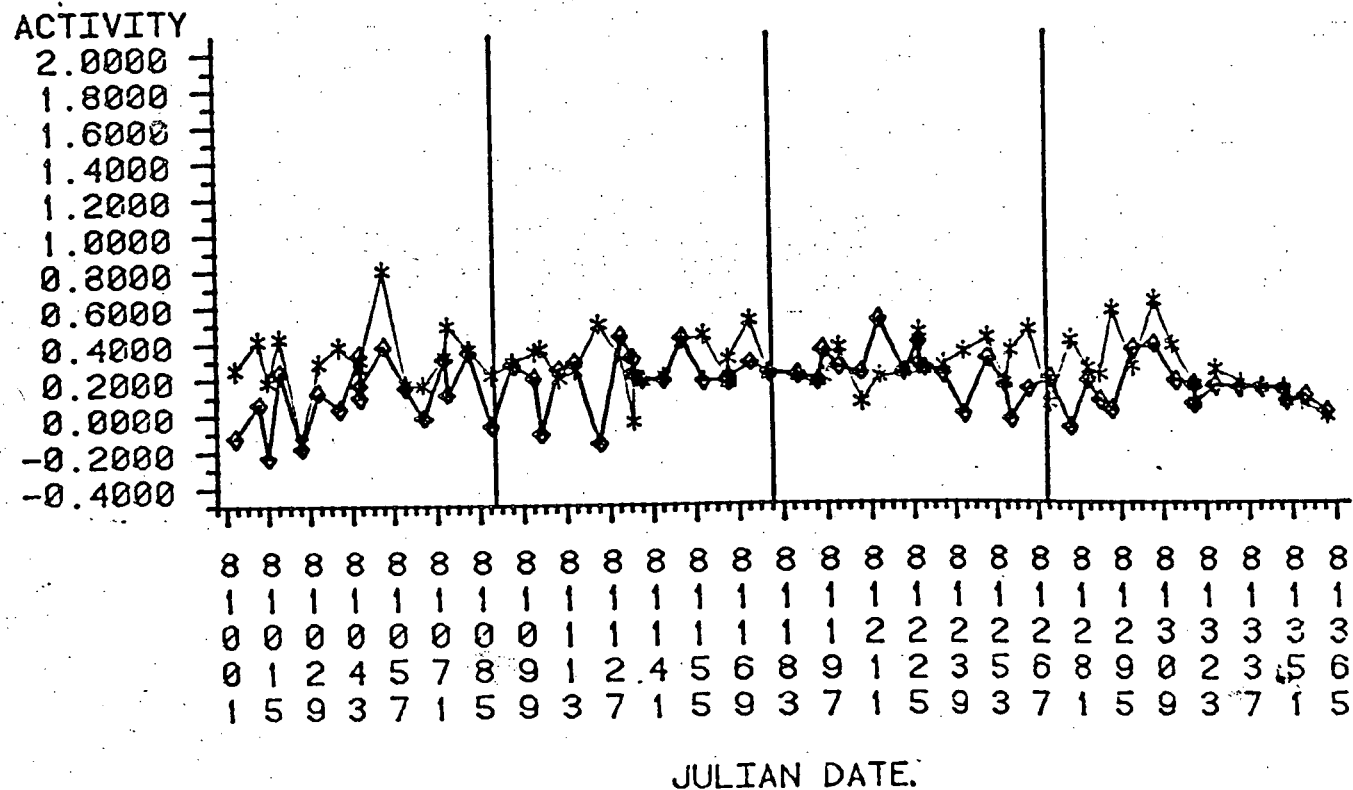
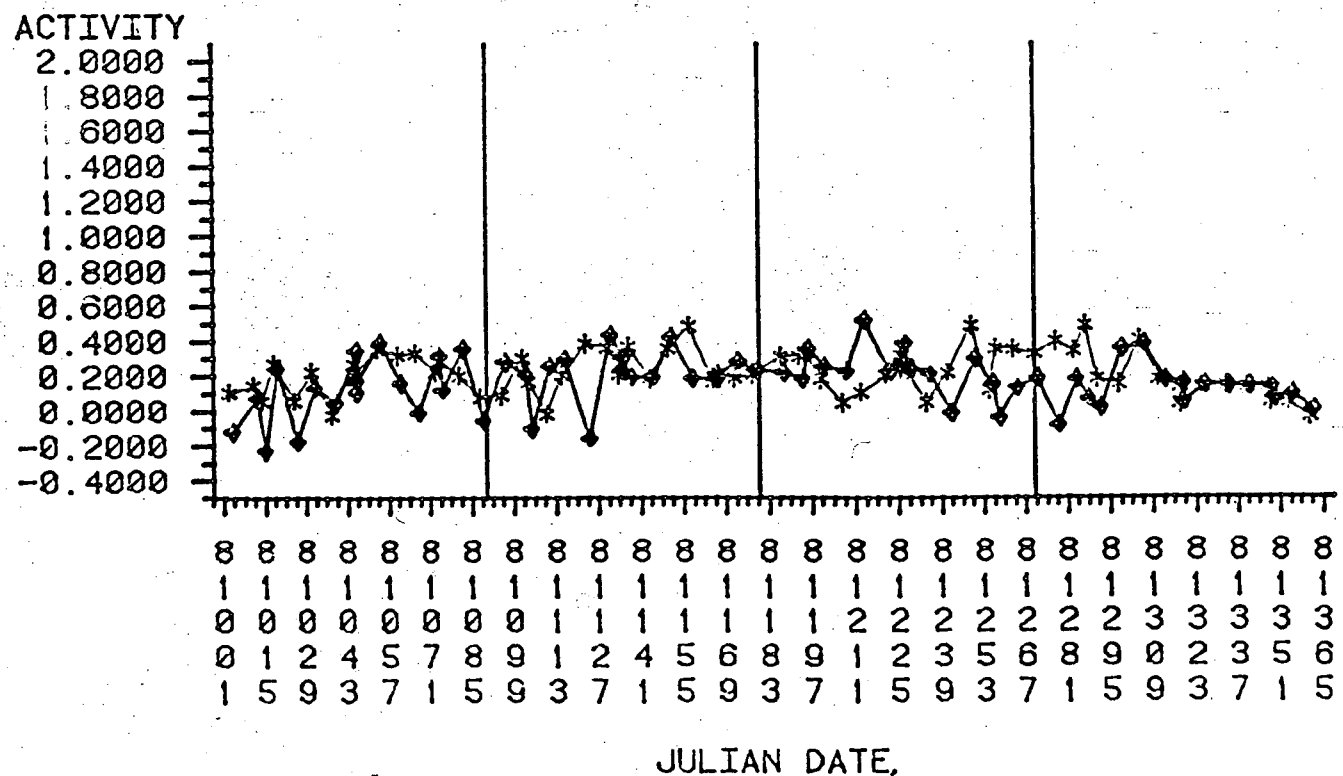


Figure 3-8

CP&L ENVIRONMENTAL MONITORING SYSTEM

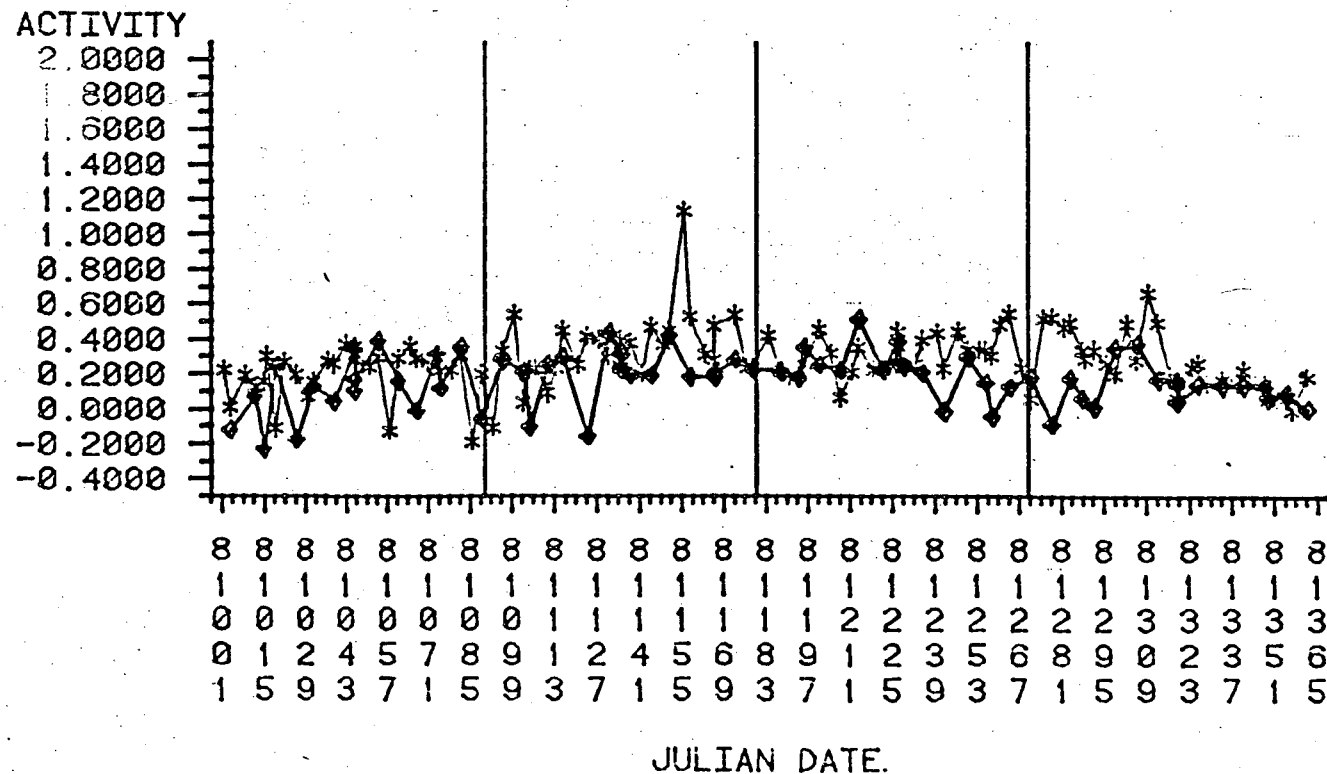
GROSS BETA  
SURFACE WATER  
(PICOCURIES PER LITER)  
COMMON LOGARITHM PLOT

PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS  
PLOT OF CONTROL STATION ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS  
PLANT=HBR POINT=08



51

GROSS BETA  
SURFACE WATER  
(PICOCURIES PER LITER)  
COMMON LOGARITHM PLOT  
PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS  
PLOT OF CONTROL STATION ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS  
PLANT=HBR POINT=11

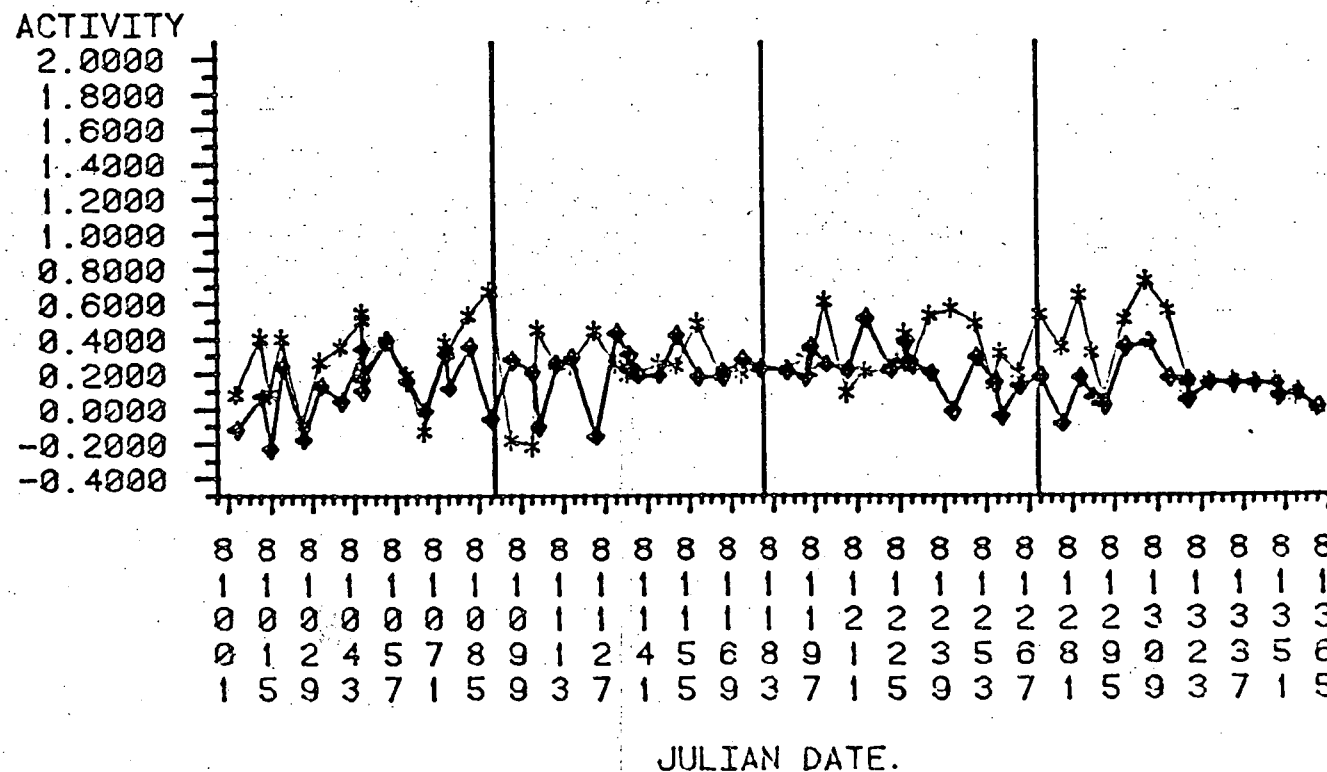




# CP&L ENVIRONMENTAL MONITORING SYSTEM

GROSS BETA  
SURFACE WATER  
(PICOCURIES PER LITER)  
COMMON LOGARITHM PLOT

PLOT OF SAMPLE STATION ACTIVITY VS. JULIAN DATE STAR AT THE POINTS  
PLOT OF CONTROL STATION ACTIVITY VS. JULIAN DATE DIAMOND AT THE POINTS  
PLANT=HBR POINT=32



### 3.9 Thermoluminescent Dosimetry Area Monitors

The average dose rate from all indicator stations was 1.67mRem/wk which is comparable to the control station average of 1.47 mRem/wk. The only significantly higher reading was observed at Station 7 (Robinson Unit 1). This station has traditionally exhibited higher readings and shows no significant change from previous years.

### 3.10 Summary

In summary, the following statements can be made in regard to all radioactive effluents (air particulate, gaseous, and liquid) by the H. B. Robinson Steam Electric Plant:

1. All detectable radioactivities have been below the levels set forth in the Code of Federal Regulations, Title 10, Part 20.
2. The radioactivity released from the H. B. Robinson Steam Electric Plant has not significantly increased the amount of radioactivity detected in the environs surrounding the plant.
3. The 3, 621 environmental analyses performed during 1981 demonstrate that the H. B. Robinson Steam Electric Plant and the environment can exist in harmony and produce electricity safely while ensuring the safety of the general public.
4. With the present environmental radiological surveillance program, the H. B. Robinson Steam Electric Plant should continue to economically produce electricity for the use of the customers of Carolina Power & Light Company.

## 4.0 MISSED SAMPLES AND ANALYSES

### 4.1 Air Particulate (Weekly)

All samples were collected; however, due to a sampler malfunction, the sample taken at Station 9 on May 4, 1981, only had a volume of 4.4 m<sup>3</sup>. Analysis of this sample would have given invalid data.

#### 4.2 Aquatic Vegetation

No gross beta, strontium, or gamma analyses were reported for January's aquatic vegetation at Station 33 because no sample was available due to ditch burn off for cleaning.

#### 4.3 Surface Water

Sample Station 50 was added to the Environmental Sampling Program in February 1981. Therefore, no sample is included for the month of January. No sample was available for collection in April due to Unit 1 20-year outage which did not permit water discharges to the ash pond.

#### 4.4 Environmental TLDs

The following thermoluminescent dosimeter results were missing in 1981:

<u>Month</u>	<u>Sample Station</u>	<u>Reason</u>
February	19	Badge Lost in Field
April	6	Badge Lost in Field
April	19	Badge Lost in Field
May	29	Badge Lost in Field



Carolina Power & Light Company

H. B. ROBINSON STEAM ELECTRIC PLANT  
Post Office Box 790  
Hartsville, South Carolina 29550

March 31, 1982

Robinson File No: 12510C

Serial: RSEP/82-631

Mr. James P. O'Reilly  
Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

The Annual Environmental Radiological Monitoring Report for 1981 is enclosed for your review. If you have any questions concerning this report, please feel free to contact me.

Very truly yours,

R. B. Starkey, Jr.  
General Manager  
H. B. Robinson S.E. Plant

BAC/tm

Enclosure

cc: Harold Denton (17)

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