RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

RIVER BEND STATION

FOR THE OPERATING PERIOD

January 1, 1987 - December 31, 1987

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Abstract

During 1987 a land use census and radiological environmental monitoring were conducted in the vicinity of River Bend Station (RBS). As part of the monitoring program, the RBS Environmental Services Group participated in an interlaboratory comparison program with slight improvement (85 versus 81 percent) in performance over the previous year. The land use census revealed five changes in receptor locations since 1986. Ten monitoring exceptions occurred, of which six involved Technical Specification requirements, although none had a significant impact on program quality. Among several hundreds of analyses, required sensitivities (Lower Limits of Detection, LLDs) were not achieved in only three cases. Although well below the required detection limits, slightly elevated (relative to baseline data) levels of Cesium-137 were occasionally measured in both indicator and control media. These Cs-137 measurements were presumably attributable to the 1986 incident at Chernobyl, Russia. The only measurable increases in concentrations of radionuclides or levels of radiation, attributable to plant operation, in the vicinity of RBS during 1987 appear to have been expected low levels in the liquid Discharge Line. These levels were barely above the required LLDs and hence substantially below Technical Specification reporting levels. Thus the 1987 Radiological Environmental Monitoring Program substantiated the adequacy of source control and effluent monitoring at River Bend Station.

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1.0 INTRODUCTION

This Annual Radiological Environmental Operating Report for the period of January 1 through December 31, 1987, is submitted in accordance with Technical Specification 6.9.1.7 of Appendix A to River Bend Station License Number NPF-47.

River Bend Station (RBS) is a 936 MWe General Electric boiling water reactor located in West Feliciana Parish, Louisiana, 4.1 km southeast of St. Francisville (Figure 1). Waste heat from RBS is dissipated via a closed cycle system using four mechanical draft cooling towers which draw makeup water from the Mississippi River, 3.3 (air) km to the west. Blowdown from the normal cooling tower system dilutes low-level liquid radioactive waste and is discharged to the Mississippi River through a 4.4-km buried pipe located downstream of the intake structure (Fig. 2). Gaseous radioactive effluents are released through the Main Plant Exhaust Duct, the Fuel Building Exhaust Duct, and the Radwaste Building Exhaust Duct.

The area within a 16-km radius of RBS includes substantial portions of West Feliciana, East Feliciana, and Pointe Coupee parishes, as well as small portions of East and West Baton Rouge parishes. Most of the land in this area is devoted, in about equal proportions, to forests and agriculture (pasture, various crops). Wetlands, streams/lakes, and urban/improved lands comprise the remainder of the immediate vicinity of the plant. Besides St. Francisville (4.1 km northwest), human population centers near RBS are New Roads (10 km southwest) and Jackson (12 km northeast). Industrial facilities in the immediate vicinity of RBS are Lambert Redi-Mix Company (1.8 km north-northeast); James River Corporation Paper Mill (5 km south); Big Cajun No. 2 Power Station (5 km southwest); and the Corps of Engineers concrete casting yard (5 km west).

The area within an 80-km radius of RBS contains portions or all of 19 Louisiana parishes and five Mississippi counties. This area has generally the same makeup as that of the immediate vicinity of RBS, although wetlands, agricultural lands, and urban/improved lands are relatively more extensive (at the expense of forested lands) in the southwestern and southeastern quadrants. Baton Rouge, centered at about 38 km southeast, is the only large city in the general vicinity of RBS.

During 1987, radiological environmental monitoring in the vicinity of RBS was performed by the Gulf States Utilities Company (GSU) Environmental Services Group, with support from the Plant Staff Radiological Programs Section in air sampler maintenance/calibration and reading/annealing of thermoluminescence dosimeters.

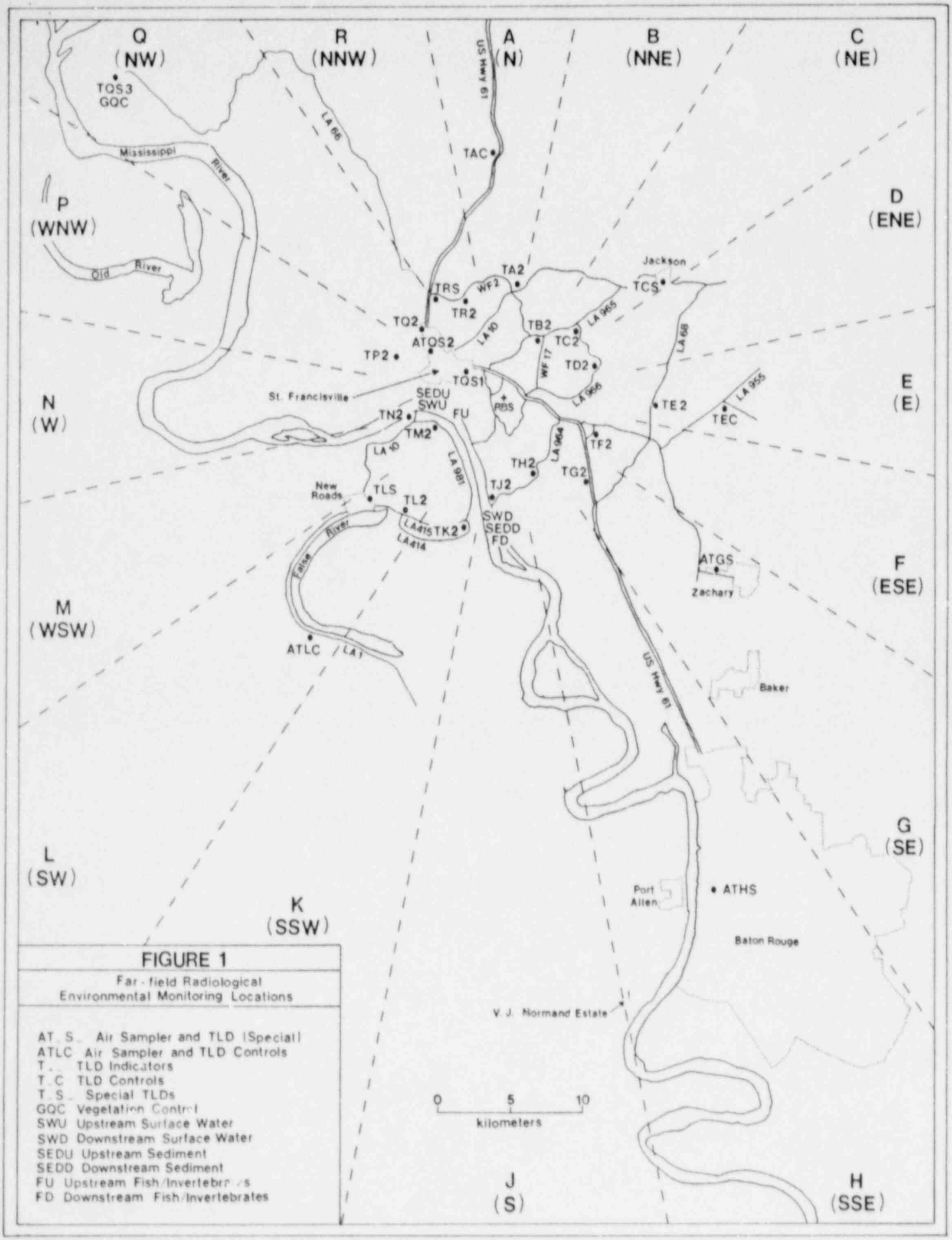

FIGURE 1

Far-field Radiological Environmental Monitoring Locations

AT_S_ Air Sampler and TLD (Special)
ATLC Air Sampler and TLD Controls
T_ _ TLD Indicators
T_C TLD Controls
T_S_ Special TLDs
GQC Vegetation Control
SWU Upstream Surface Water
SWD Downstream Surface Water
SEDU Upstream Sediment
SEDD Downstream Sediment
FU Upstream Fish/Invertebrates
FD Downstream Fish/Invertebrates

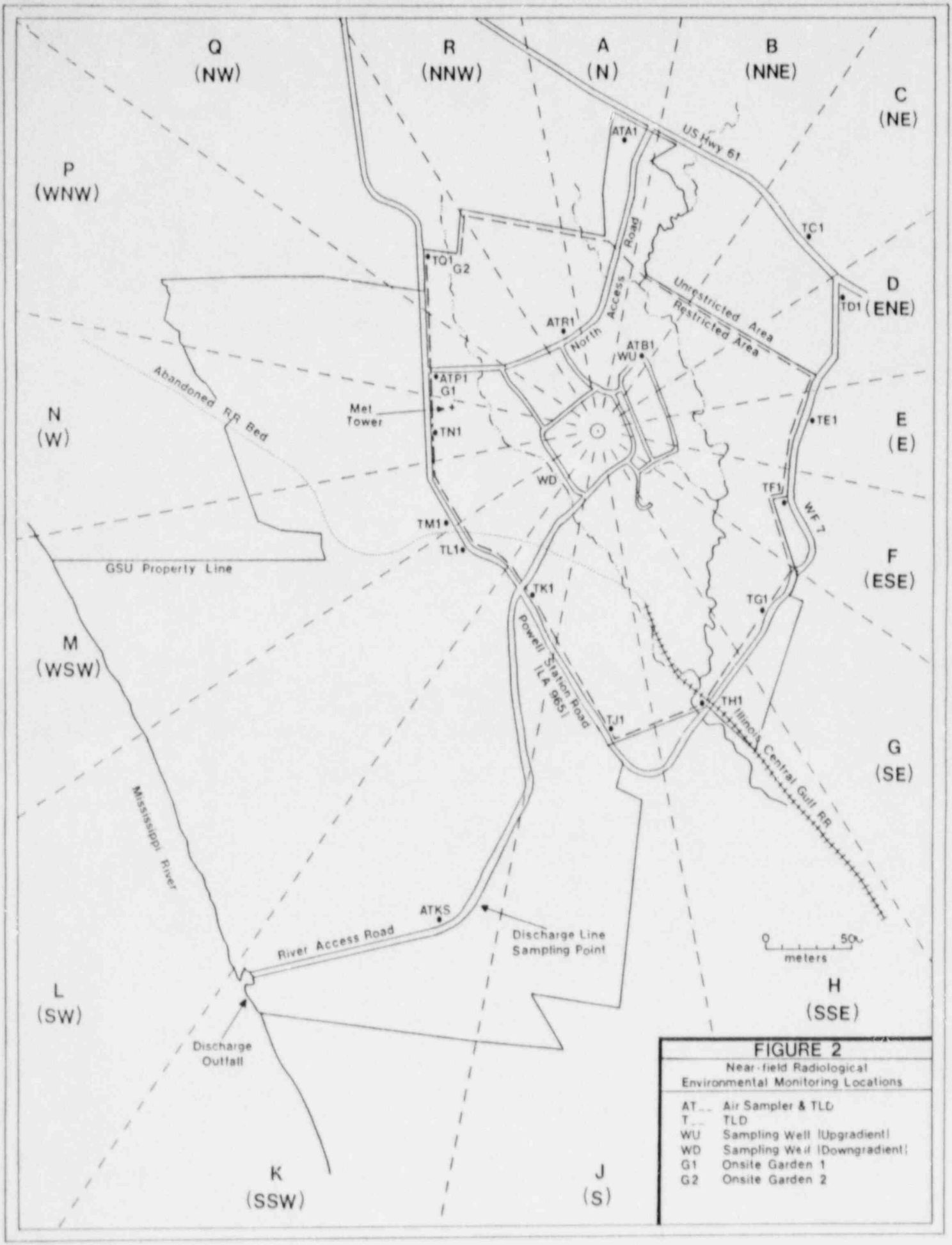

FIGURE 2

Near-field Radiological Environmental Monitoring Locations

AT__	Air Sampler & TLD
T__	TLD
WU	Sampling Well (Upgradient)
WD	Sampling Well (Downgradient)
G1	Onsite Garden 1
G2	Onsite Garden 2

2.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

2.1 Purpose/Bases

The Radiological Environmental Monitoring Program (REMP) was established to provide representative measurements of radiation and of radioactive materials, resulting from RBS operation, in those exposure pathways and for those radionuclides that lead to the highest potential exposures of members of the public. The REMP implements Section IV.B.2 of Appendix I to 10CFR50 and thereby supplements the radioactive effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways.

The REMP applies the concepts of indicator-control and preoperational-operational intercomparisons to verify the adequacy of source controls and resultant human radiation doses. In addition to 10CFR50, Appendix I, the program is based on guidance provided in the Nuclear Regulatory Commission's Radiological Branch Technical Position, Revision 1, November 1979, as well as Regulatory Guides 4.1 and 4.15.

2.2 Environmental Radiation Exposure Pathways

Elements of the REMP monitor indications of the impacts of gaseous (airborne) and liquid effluents released from River Bend Station. The specific methods used in monitoring the pathways by which these effluents could lead to human exposure, based on existing demographic information, are:

HUMAN EXPOSURE PATHWAYS

(A)	Airborne Pathway	Monitoring Media
	Immersion Dose	Air Samples (Particulates and Radioiodines)
	Ingestion (Internal) Dose	Vegetation/Food Crop Samples Air Samples
(B)	Direct Exposure Pathway	Monitoring Media
	External Dose	Thermoluminescence Dosimetry (TLD) Area Monitors
(C)	Waterborne Pathway	Monitoring Media
	Ingestion (Internal) Dose	Surface Water Samples Groundwater Samples Drinking Water Samples Fish/Invertebrate Samples Shoreline Sediment Samples

(C) Waterborne Pathway (cont.)	Monitoring Media
Immersion (External) Dose	Surface Water Samples Shoreline Sediment Samples

Site-related dispersion characteristics, demography, hydrol y, land use, anticipated source terms, and the exposure pathways outlined above were considered in the selection of the sample media, sampling and analysis frequencies, sampling/measurement locations, and types of analyses. These criteria were used to establish both the preoperational and operational phases of the REMP.

The program that evolved during the preoperational (baseline) monitoring phase, incorporating all of the elements in the RBS Technical Specifications (3/4.12.1, 3/3.12.2, 3/4.12.3) plus special study criteria, is illustrated in Table 1 and Figures 1 and 2.

2.3 Land Use Census for 1987

The annual land use census was conducted during the 1987 growing season in accordance with RBS Technical Specification 3/4.12.2. Table 2 summarizes the results and notes changes in nearest receptor locations from those identified in the Radiological Environmental Operating Report for 1986.

As in previous years, the 1987 census identified residences within 8 km of the reactor containment in all sectors except L (SW). Distance to the nearest residence in Sector P (WNW) decreased from 4.5 to 4.2 km. Distance to the nearest garden in Sector A (N) decreased from 2.0 to 1.8 km. Distance to the nearest garden in Sector E (E) increased from 2.2 to 2.6 km. Gardens identified within 8 km in sectors H (SSE) and M (WSW) in 1986 were found to have been discontinued in 1987. The gardens identified in sectors P (WNW) and Q (NW) are the onsite gardens established in the sectors with the highest calculated annual average ground-level D/Q. These gardens are REMP indicator locations for broadleaf vegetation (Table 1, Fig. 2).

No dairy animals were found within 8 km of RBS during the 1987 census. Historically, there had never been enough dairy sites to accommodate the minimum RBS Technical Specification requirements for analyses of milk (3 locations within 5 km), so monitoring of broadleaf vegetation has been performed from the outset.

2.4 Interlaboratory Comparison Program Results for 1987

The Environmental Services Group participated in the U. S. Environmental Protection Agency (USEPA) Laboratory Intercomparison Program during 1987 in accordance with RBS Technical Specification 3/4.12.3. RBS results (Table 3) were near the "known" value, or within the USEPA range of expected laboratory precision for 85 percent of the analyses.

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TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Airborne Particulates and Radioiodines	Samples from 9 locations:		
	INDICATOR STATIONS		
	AA1. River Bend Training Center; 1.7 km N.	Continuous air sampler with filter collection weekly or as required by dust loading, whichever is more frequent.	Charcoal cartridge: analysis weekly for radioiodine. Particulate sampler: gross beta activity following filter changes; composite for gamma isotopic quarterly.
	AR1. River Bend Station North Access Road at Gate #3; 0.8 km NNW.	"	"
	AP1. Near River Bend Station Onsite Garden #1; 0.9 km WNW.	"	"
	AQS2. St. Francis Substation on US Hwy. (Bus.) 61 in St. Francisville; 5.8 km NW (Community Location).	"	"
	CONTROL AND SPECIAL STATIONS (1)		
	ALC. Parlange Power Center in Oscar; 20 km SW (Control).	"	"
	AB1. River Bend Station iron yard area; 0.5 km NNE. (1, 2)	"	"
	AKS. River Bend Station River Access Road; 2.8 km SSW. (1, 2)	"	"
	AGS. GSU Service Center compound in Zachary; 17 km SE. (1, 2)	"	"
	AHS. Roof of GSU Service Office Building, North Blvd., Baton Rouge; 40 km SSE. (1, 2)	"	"

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TABLE 1

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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Direction Radiation	Measurements from 44 locations:		
	INDICATOR STATIONS		
	TA1. River Bend Training Center; 1.7 km N.	Thermoluminescence dosimeters (TLDs); deployment/retrieval monthly and quarterly. (3)	Gamma dose monthly and quarterly. (3)
	TA2. GSU utility pole #246 at Jct. of LA Hwy. 10 and West Feliciana Parish Road (WF) 2 in Elm Park; 8 km N.	"	"
	TB1. River Bend Station iron yard area; 0.5 km NNE.	"	"
	TB2. Stub pole at Jct. LA Hwy. 965 and Audubon Lane (WF 17); 5 km NNE.	"	"
	TC1. Stub pole at Jct. US Hwy. 61 and Old Highway 61; 1.7 km NE.	"	"
	TC2. Stub pole along LA Hwy. 966, 0.6 km S. of Jct. LA Hwys. 966 and 965; 7 km NE.	"	"
	TD1. Stub pole along WF 7, 150 m S. of Jct. WF 7 and US Hwy. 61; 1.6 km ENE.	"	"
	TD2. Stub pole along LA Hwy. 966, 4 km S. of Jct. LA Hwys. 966 and 965; 6.3 km ENE.	"	"
	TE1. Stub pole along WF 7, 1 km S. of Jct. WF 7 and US Hwy. 61; 1.3 km E.	"	"
	TE2. Gravel Power Center on LA Hwy. 68, 2 km N. of Jct. LA Hwys. 68 and 964; 10 km E.	"	"

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TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Direct Radiation (continued)	TF1. Stub pole along WF 7, 1.6 km S. of Jct. WF 7 and US Hwy. 61; 1.3 km ESE.	Thermoluminescence dosimeters (TLDs); deployment/retrieval monthly and quarterly. (3)	Gamma dose monthly and quarterly. (3)
	TF2. On LA Hwy. 954, 0.6 km N. of Jct. LA Hwy. 954 and US Hwy. 61; 6 km ESE.	"	"
	TG1. Stub pole along WF 7, 2 km S. of Jct. WF 7 and US Hwy. 61; 1.6 km SE.	"	"
	TG2. Telephone pole at gate to Marathon Tank Farm on US Hwy. 61 near Delombre; 7.5 km SE.	"	"
	TH1. Stub pole at Illinois Central Gulf RR crossing of WF 7 (near Grants Bayou); 1.7 km SSE.	"	"
	TH2. First telephone pole on LA Hwy. 964 N. of entrance to James River Corporation paper mill; 5.5 km SSE.	"	"
	TJ1. Stub pole near River Bend Station Gate #23 on Powell Station Road (LA Hwy. 965); 1.5 km S.	"	"
	TJ2. Large tree along River Road, 100 m N. of James River Corporation intake structure; 5.8 km S.	"	"
	TK1. GSU utility pole #L10178 on Powell Station Road (LA Hwy. 965), 20 m S. of River Bend Station River Access Road; 0.9 km SSW.	"	"
	TK2. Stub pole at Jct. LA Hwys. 414 and 415; 8 km SSW.	"	"

TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Direct Radiation (continued)	TL1. Second utility pole on Powell Station Road (LA Hwy. 965) S. of Illinois Central Gulf RR crossing; 1.0 km SW.	Thermoluminscence dosimeters (TLDs); deployment/retrieval monthly and quarterly. (3)	Gamma dose monthly and quarterly. (3)
	TL2. Second utility pole along LA Hwy. 415 E. of Louisiana and Arkansas RR crossing (near Patin's Dike); 9.5 km SW.	"	"
	TM1. First utility pole on Powell Station Road (LA Hwy. 965) N. of Illinois Central Gulf RR crossing; 0.9 km WSW.	"	"
	TM2. Utility pole along LA Hwy. 981, about 3 km S. of Jct. LA Hwys. 981 and 10; 4.2 km WSW.	"	"
	TN1. Utility pole along Powell Station Road (LA Hwy. 965), between River Bend Station Gates #13 and #14; 0.9 km W.	"	"
	TN2. Utility pole with electrical meter near west bank ferry landing (LA Hwy. 10); 6 km W.	"	"
	TP1. Near River Bend Station Onsite Garden #1; 0.9 km WNW.	"	"
	TP2. Stub pole about 1.5 km N. of former Illinois Central Gulf RR trestle on Tunica Street, western outskirts of St. Francisville; 7.3 km WNW.	"	"
	TQ1. GSU property sign along Powell Station Road (LA Hwy. 965), about 1 km N. of River Bend Station North Access Road; 1.4 km NW.	"	"
	TQ2. GSU pole at Jct. of North Commerce and American Beauty Streets, St. Francisville; 6.9 km NW.	"	"

TABLE 1

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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Direct Radiation (continued)	TR1. River Bend Station North Access Road at Gate #3; 0.8 km NNW.	Thermoluminescence dosimeters (TLDs); deployment/retrieval monthly and quarterly. (3)	Gamma dose monthly and quarterly. (3)
	TR2. Stub pole along WF 2 at Jacock Road, about 1.8 km E. of Jct. WF 2 and US Hwy. 61; 8 km NNW.	"	"
	CONTROL AND SPECIAL STATIONS (1)		
	TAC. Telephone pole along US Hwy. 61 about 200 m N. of Hamilton Station Water Tower, near Wakefield; 18 km N (Control).	"	"
	TEC. Stub pole at Jct. of LA Hwy. 955 and Midway Road, 4.8 km N. of Jct. LA Hwys. 955 and 964; 16 km E. (1, 2)	"	"
	TLC. Parlange Power Center in Oscar; 20 km SW (Control).	"	"
	TQS1. Behind Pentecostal Church (opposite West Feliciana Hospital) near Jct. US Hwy. 61 and Ferdinand Street; 4 km NW. (1)	"	"
	TQS2. St. Francis Substation on US Hwy. (Bus.) 61 in St. Francisville; 5.8 km NW. (1)	"	"
	TLS. Utility pole near False River Academy sign at edge of New Roads; 9.9 km SW. (1)	"	"
	TCS. Utility pole at gate to East Louisiana State Hospital in Jackson; 12.3 km NE. (1)	"	"

TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Direct Radiation (continued)	TGS. GSU Service Center compound in Zachary; 17 km SE. (1)	Thermoluminescence dosimeters (TLDs); deployment/retrieval monthly and quarterly. (3)	Gamma dose monthly and quarterly. (3)
	THS. Roof of GSU Service Office Building, North Blvd., Baton Rouge; 40 km SSE. (1)	"	"
	TKS. River Bend Station River Access Road; 2.8 km SSW. (1, 2)	"	"
	TQS3. Utility pole at Louisiana State Penitentiary dairy, near Angola; 35 km NW. (1, 2)	"	"
	TRS. Stub pole at Jct. of WF 2 and US Hwy. 61, near Bains (West Feliciana High School); 9.2 km NNW. (1, 2)	"	"
Waterborne	SURFACE WATER (4)		
	SWU. Mississippi River about 4 km upstream from the plant liquid discharge outfall, near LA Hwy. 10 ferry crossing.	Weekly grabs composited over monthly and quarterly periods.	Monthly composite: gamma isotopic and gross beta analyses. (5) Quarterly composite: tritium analysis.
	SWD. Mississippi River about 4 km downstream from the plant liquid discharge outfall, near paper mill.	"	"
	Discharge Line. At blowdown control structure along River Access Road.	Hourly grabs composited monthly and quarterly.	"
	DRINKING WATER (6)		
	Nearest downstream water supply, People's Water Service Company in Donaldsonville; 138 river km downstream from the plant liquid discharge outfall.	Weekly grabs composited over monthly and quarterly periods.	"

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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Waterborne (continued)	GROUNDWATER		
	WD. Upland Terrace Aquifer well downgradient from plant, about 470 m SW.	Quarterly grab.	Gross beta, gamma isotopic and tritium analyses quarterly. (5)
	WU. Upland Terrace Aquifer well upgradient from plant, about 470 m NNE (Control).	"	"
	SHORELINE SEDIMENT		
	SEDD. East shore of Mississippi River about 4 km downstream from plant, near James River Corporation paper mill.	Semiannual grab.	Gamma isotopic analysis semiannually.
	SEDU. East shore of Mississippi River about 4 km upstream from plant, near LA Hwy. 10 ferry landing. (2)	"	"
Ingestion	FISH AND INVERTEBRATES		
	FD. One sample of each of three commercially and/or recreationally important species from downstream area influenced by plant discharge. (7)	Semiannually or seasonally when available.	Gamma isotopic analysis on edible portions semi-annually or seasonally.
	FU. One sample of each of three commercially and/or recreationally important species from upstream area not influenced by plant discharge (Control). (7)	"	"

TABLE 1

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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Ingestion (continued)	PRODUCE (8)		
	G1/G2. Two samples of each of three different kinds of leafy vegetables from onsite gardens near the site boundary in areas of highest calculated annual average ground-level D/Q; 1 km WNW and 1.3 km NW.	Monthly during growing season.	Gamma isotopic and I-131 analyses monthly.
	GQC. One sample of each of three different kinds of leafy vegetables from LA State Penitentiary at Angola; 35 km NW (Control).	"	"

NOTES:

(1) For purposes of data summary, comparisons, and discussion, the sampling locations designated as "Special Interest" are treated as indicator stations if they are within 16 km of RBS and control stations if they are beyond 16 km.

(2) Sample/measurement location not required by RBS Technical Specifications (not identified in ODCM).

(3) Sampling and/or analysis frequency greater than required by RBS Technical Specifications and ODCM.

(4) The upstream (control) sample is taken at a distance beyond influence of the plant discharge. The downstream (indicator) sample is taken in an area beyond but near the mixing zone.

(5) Gross beta analysis not required by RBS Technical Specifications and ODCM.

(6) Drinking water sampling/analyses not required by RBS Technical Specifications and ODCM. (No drinking water pathway exists due to extreme distance of nearest intake.) The upstream surface water sampling location (SWU) is used as a "control" for drinking water analyses comparisons.

(7) Preferred species are river shrimp, blue catfish, and freshwater drum; if catfish and drum are unavailable, other edible species may be substituted.

(8) No irrigation pathway exists due to the extreme distance of nearest domestic water intake (see Note 6); leafy vegetables are sampled/analyzed because of limited availability of milk samples.

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TABLE 2

RESULTS OF LAND USE CENSUS

Sector	Nearest Residence	Range (Km)	Nearest Garden	Range (Km)	Nearest Dairy	Range (Km)
A (N)	Jones	1.8	Jones[1]	1.8	-	-
B (NNE)	Dreher	1.6	Harvey	1.8	-	-
C (NE)	Magee	1.5	Magee	1.5	-	-
D (ENE)	Miller	1.4	Daniel	1.6	-	-
E (E)	Bickham	2.2	Thomas[2]	2.6	-	-
F (ESE)	Shelton	3.4	Bickham	3.5	-	-
G (SE)	Mills	6.6	Mills	6.6	-	-
H (SSE)	Koffman	1.7	_____[3]	-	-	-
J (S)	Bliss	1.8	Bliss	1.8	-	-
K (SSW)	Guillory	7.4	Guillory	7.4	-	-
L (SW)	-	-	-	-	-	-
M (WSW)	Major	4.2	_____[3]	-	-	-
N (W)	Lacost	6.1	-	-	-	-
P (WNW)	Davey[1]	4.2	GSU #1	1.0	-	-
Q (NW)	Leet	1.3	GSU #2[1]	1.1	-	-
R (NNW)	Veteto	1.6	Monroe	3.0	-	-

1 The 1987 receptor location was nearer than the receptor location listed in the 1986 REMP Report.

2 The 1987 receptor location was farther than the receptor location listed in the 1986 REMP Report.

3 The receptor location listed for 1986 was discontinued for 1987.

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TABLE 3

USEPA INTERCOMPARISON (CROSS-CHECK) PROGRAM PARTICIPATION RESULTS

SAMPLE TYPE (Units)	DATE	ANALYSIS	USEPA "KNOWN" VALUE[a]	RIVER BEND VALUE	AVERAGE RESULT (All Participants)[b]
AIR FILTER (pCi/filter)	4/10/87	Beta	43±5	60.7	45.31±5.02
	4/10/87	Cs-137	8±5	9.0	9.27±2.10
	8/28/87	Beta	30±5	40.3	30.31±4.32
	8/28/87	Cs-137	10±5	10.7	10.66±1.86
FOOD (pCi/kg)	1/30/87	I-131	78±8	74.[illegible][c]	80.90±6.23
	1/30/87	Cs-137	84±5	90.7[c]	87.86±5.04
	7/31/87	I-131	80±8	76.0	81.11±7.29
	7/31/87	Cs-137	50±5	50.7	52.07±4.65
WATER (pCi/liter)	1/23/87	Beta	10±5	10.7	11.19±2.30
	2/13/87	H-3	4209±421	3972	4156±418
	3/20/87	Beta	13±5	11.9[c]	12.83±2.36
	4/3/87	I-131	7±0.7	7.5	7.26±1.08
	4/20/87	Beta	66±5	41.6[c]	64.51±7.31
	4/20/87	Co-60	8±5	8.0	9.04±1.95
	4/20/87	Cs-134	20±5	16.7	18.19±2.57
	4/20/87	Cs-137	15±5	13.3	15.68±2.17
	5/23/87	Beta	7±5	9.0	7.89±2.16
	6/12/87	H-3	2895±357	2719	2785±293
	7/24/87	Beta	5±5	5.7	6.05±1.79
	8/7/87	I-131	48±6	40.3	47.19±4.87
	9/18/87	Beta	12±5	13.3	12.00±2.23
	10/16/87	H-3	4492±449	4126	4386±219
	10/21/87	Beta	72±5	75.7[c]	75.22±9.28
	10/21/87	Co-60	16±5	17.7[c]	16.57±2.23
	10/21/87	Cs-134	16±5	16.3[c]	15.67±2.59
	10/21/87	Cs-137	24±5	24.7[c]	24.29±2.20
	11/20/87	Beta	19±5	16.3	18.55±3.66

NOTES:

(a) USEPA "known" values are listed with a range reflecting "expected laboratory precision."

(b) The grand average of all participants' results (excluding outliers) is listed with the experimental (calculated) sigma for all laboratories.

(c) Analyses performed but results not reported to USEPA (thus not included in participants' average).

RBS analyses of two USEPA cross-check air filter sets overestimated gross beta activity. The discrepancy seems attributable to the greater thickness of EPA air filter media, resulting in a higher counting efficiency for these filters than for those used in the RBS monitoring program. Gross beta results for water closely agreed with the "known" values, except for that of 4/20/87, which appears attributable to technician error.

Results for I-131 in water performed by gamma ray spectroscopy agreed closely for the 4/3/87 cross-check sample, but I-131 activity was underestimated in the 8/7/87 cross-check sample. The latter was concentrated by evaporation before counting, rather than extracted by ion-exchange, which may have resulted in some loss of radioiodine due to volatilization.

2.5 Program Exceptions

Certain samples and analyses were inadvertently omitted or unavoidably altered during the 1987 operating period. These exceptions and the reasons for the omissions/alterations are delineated in Table 4 in accordance with Technical Specification requirements. Corrective actions and impacts on program quality are discussed below.

Power was interrupted to one of the required indicator air samplers (AR1) during part of one week and for all of the following week. A defective Ground-Fault-Interrupter receptacle was replaced. Review of meteorological data (Appendix B) indicates that sampler AR1 was downwind of RBS airborne releases from 7.8-8.9 percent of the time in the week of 1/19/87-1/26/87 and from 11.3-15.5 percent of the time in the week of 1/26/87-2/2/87. Considering the relatively short period of potential upwind releases, and that sampler AA1 was continously operating in the adjacent sector, this loss of data is deemed to have had no significant impact on program quality. Storm-related power outages briefly impacted two special interest air samplers (AB1 and AK5) during the summer of 1987, with no appreciable effect on program quality.

Two quarterly thermoluminescence dosimeters (TLDs) at the same location (TR2) were lost due to vandalism and were replaced at the beginnings of subsequent measurement periods. "TR2" was then moved to a better-camouflaged position at the same range and essentially the same sector azimuth. Inasmuch as four of the six co-located monthly TLDs were successfully retrieved from TR2, the loss of the quarterly badges did not significantly impact program quality.

Slight damage to tubing in the automatic compositing water sampler in the Discharge Line caused each hourly aliquot to be about 5 mls short during the last 8 to 10 hours of a 168-hour sampling period. The tubing was repaired, and this incident is deemed to have had no impact on program quality.

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TABLE 4

MONITORING PROGRAM EXCEPTIONS

Sample Type	Period	Location	Exception/Reason
Air Particulates and Radioiodines	1/19/87-1/26/87	AR1	About 40% of normal weekly sample volume not obtained due to apparent electrical problem.
"	1/26/87-2/2/87	AR1	No sample obtained due to electrical problem.
"	6/8/87-6/15/87	AB1	*About 27% of normal weekly sample volume not obtained due to power outage.
"	8/10/87-8/17/87	AKS	*About 81% of normal weekly sample volume not obtained due to power outage.
Direct Radiation (TLD)	1st Quarter	TR2	TLD lost due to vandalism.
"	January	TR2	*TLD lost due to vandalism.
"	2nd Quarter	TR2	TLD lost due to vandalism
"	April	TR2	*TLD lost due to vandalism.
Water (Composite)	7/21/87-7/28/87	Discharge Line	Normal sample volume of 5 04 liters was short by approximately 50 ml due to faulty tubing in automatic sampler.
Broadleaf Vegetation	December	GQC	Only two (2) of three (3) samples collected due to limited availability.

* Sample/measurement is not required by RBS Technical Specifications (not identified in ODCM).

Limited variety in the crops available at the state penitentiary (GQC) during December resulted in failure to obtain one out of 36 required control samples of broadleaf vegetation for 1987. This did not significantly impact program quality.

3.0 INTERPRETATION OF REMP RESULTS

3.1 Summary of Operational REMP Results

Monitoring results for the exposure pathways are summarized in Table 5, from which measured activities of the naturally occurring daughters of uranium and thorium are excluded. For purposes of data summary, comparison, and discussion, the sampling locations designated "Special Interest" in Table 1 and treated as indicator stations if they are within 16 km of RBS and control stations if they are beyond 16 km.

3.1.1 Airborne Exposure Pathway - Measurements of radioiodine and other gamma emitters were all below their respective Lower Limits of Detection (LLDs) -- that is, "undetectable" at the required analytical sensitivities. Traces of Cs-137 (0.014 pCi/cubic meter) were measured at Location AHS during the week ending 11/2/87 and again at Location AKS (0.040 pCi/cubic meter) during the week ending 8/17/87. In the latter case, power to the sampler was interrupted by a thunderstorm after only 70 of the normal total of about 400 cubic meters of air were filtered. In both of these cases, the slightly increased levels of Cs-137 may represent a "legacy" (i.e., delayed fallout) from the spring, 1986, incident at Chernobyl, Russia. Gross beta activities averaged 0.03 pCi/cubic meter at both indicator and control stations.

3.1.2 Direct Exposure Pathway - The monthly average gamma ray exposure for indicator and control locations was 3.43 mR total and 4.03 mR total, respectively. Quarterly exposures averaged 11.83 mR total at indicator locations and 11.95 mR total at control locations.

3.1.3 Waterborne Exposure Pathway - No gamma emitters were measured in water at levels approaching the Technical Specification LLDs, although Mn-54, Co-58, and Co-60 were measured in a few monthly composite samples from the Discharge Line at concentrations between 1 and 13 pCi/liter. Gross beta activities in surface water averaged 21.8 pCi/liter in the Discharge Line and nearly 9 pCi/liter at all other stations. Tritium (H-3) activities in surface water averaged 2650 pCi/liter in the Discharge Line and from 1500 to 1700 pCi/liter at all other locations. Gross beta activities averaged 1.95 and 2.22 pCi/liter in the downgradient and upgradient groundwater, respectively. Groundwater tritium concentrations averaged 1580 pCi/liter downgradient and 1610 pCi/liter upgradient. Besides naturally-occurring gamma emitters, Cs-137 was measured in shoreline sediment from the Mississippi River above (35.7 pCi/kg-dry) and below (54.9 pCi/kg-dry) RBS. As in the case of the airborne Cs-137 activities, these slightly elevated levels (relative to baseline conditions) may be attributable to the Chernobyl incident.

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
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River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/87 - 12/31/87

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations Mean (f)[2] Range	Location with Highest Annual Mean Name Dist./Dir.	Mean (f)[2] Range	Control Locations Mean (f)[2] Range	Number of Nonroutine Reported Results
Air Particulate (pCi/m^3)	Gross Beta (466)	0.01	0.027 (310/312) 0.005 - 0.057	AP1 0.9 km WNW	0.028 (52/52) 0.011 - 0.050	0.025 (156/156) 0.008 - 0.044	0
	Be-7 (466)	None Required	0.213 (76/312) 0.101 - 0.666	AA1 1.7 km N	0.251(13/52) 0.101 - 0.666	0.204 (36/156) 0.100 - 0.315	0
	K-40 (466)	None Required	0.481 (185/312) 0.228 - 0.904	AP1 0.9 km WNW	0.509 (27/52) 0.274 - 0.742	0.434 (96/156) 0.19[illegible] - 0.872	0
	Cs-134 (466)	0.05	All <LLD			All <LLD	0
	Cs-137 (466)	0.06	All <LLD			All <LLD	0
Air Radioiodine (pCi/m^3)	I-131 (466)	0.07	All <LLD			All <LLD	0
Direct (TLD)[3] (mR Total)	Gamma Monthly (526)		3.43 (454/456) 1.48 - 4.80	TM2 4.2 km WSW	4.08 (12/12) 2.85 - 4.67	3.48 (72/72) 1.63 - 4.71	0
	Gamma Quarterly (174)		11.83 (150/152) 7.62 - 14.87	TA2 8.0 km N	13.74 (4/4) 12.90 - 14.68	11.95 (24/24) 9.46 - 15.35	0
Surface Water (pCi/liter)	H-3 (12)	2000	2150 (8/8) 1420 - 3310	Discharge Line	2650 (4/4) 1990 - 3310	1530 (4/4) 1270 - 1900	0
	Mn-54 (36)	15	4.67 (3/24) 1.40 - 8.07	Discharge Line	4.67 (3/12) 1.40 - 8.07	All <LLD	0
	Co-58 (36)	15	3.83 (4/24) 2.08 - 5.63	Discharge Line	3.83 (4/12) 2.08 - 5.63	All <LLD	0

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
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West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/87 - 12/31/87

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations[2] Mean (f) Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations[2] Mean (f) Range	Number of Nonroutine Reported Results
Surface Water (pCi/liter) (continued)	Fe-59 (36)	30	All <LLD			All <LLD	0
	Co-60 (36)	15	6.29 (7/24) 2.12 - 12.7	Discharge Line	6.29 (7/12) 2.12 - 12.7	All <LLD	0
	Zn-65 (36)	30	All <LLD			All <LLD	0
	Nb-95 (36)	15	All <LLD			All <LLD	0
	Zr-95 (36)	30	All <LLD			All <LLD	0
	I-131[4] (36)	15	All <LLD			All <LLD	0
	Cs-134 (36)	15	All <LLD			All <LLD	0
	Cs-137 (36)	18	All <LLD			All <LLD	0
	Ba-140 (36)	60	All <LLD			All <LLD	0
	La-140 (36)	15	All <LLD			All <LLD	0
	Gross Beta (36)	4	15.20 (24/24) 4.71 - 37.30	Discharge Line	21.80 (12/12) 4.71 - 37.30	8.93 (12/12) 5.63 - 16.50	0
Groundwater (pCi/liter)	H-3 (8)	2000	1580 (4/4) 1280 - 1840	WU 470 m NNE	1610 (4/4) 1360 - 1920	1610 (4/4) 1360 - 1920	0
	Mn-54 (8)	15	All <LLD			All <LLD	0
	Co-58 (8)	15	All <LLD			All <LLD	0

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
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Docket Number: 50-458
Reporting Period: 1/1/87 - 12/31/87

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations Mean (f)[2] Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations Mean (f)[2] Range	Number of Nonroutine Reported Results
Groundwater (pCi/liter) (continued)	Fe-59 (8)	30	All <LLD			All <LLD	0
	Co-60 (8)	15	All <LLD			All <LLD	0
	Zn-65 (8)	30	All <LLD			All <LLD	0
	Nb-95 (8)	15	All <LLD			All <LLD	0
	Zr-95 (8)	30	All <LLD			All <LLD	0
	I-131 (8)	15	All <LLD			All <LLD	0
	Cs-134 (8)	15	All <LLD			All <LLD	0
	Cs-137 (8)	18	All <LLD			All <LLD	0
	Ba-140 (8)	60	All <LLD			All <LLD	0
	La-140 (8)	15	All <LLD			All <LLD	0
	Gross Beta (8)	4	1.95 (3/4) 1.26 - 2.35	WU 470 m NNE	2.22 (3/4) 1.34 - 2.70	2.22 (3/4) 1.34 - 2.70	0
Drinking Water[5] (pCi/liter)	H-3 (4)	2000	1530 (4/4) 1290 - 1870	SWU 4 km Upstream	1530 (4/4) 1270 - 1900	1530 (4/4) 1270 - 1900	0
	Mn-54 (12)	15	All <LLD			All <LLD	0
	Co-58 (12)	15	All <LLD			All <LLD	0

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
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Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations Mean (f)[2] Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations Mean (f)[2] Range	Number of Nonroutine Reported Results
Drinking Water[5] (pCi/liter) (continued)	Fe-59 (12)	30	All <LLD			All <LLD	0
	Co-60 (12)	15	All <LLD			All <LLD	0
	Zn-65 (12)	30	All <LLD			All <LLD	0
	Nb-95 (12)	15	All <LLD			All <LLD	0
	Zr-95 (12)	30	All <LLD			All <LLD	0
	I-131 (12)	15	All <LLD			All <LLD	0
	Cs-134 (12)	15	All <LLD			All <LLD	0
	Cs-137 (12)	18	All <LLD			All <LLD	0
	Ba-140 (12)	60	All <LLD			All <LLD	0
	La-140 (12)	15	All <LLD			All <LLD	0
	Gross Beta (12)	4	10.40 (12/12) 6.26 - 15.50	Donaldsonville 138 km Downstream	10.40(12/12) 6.26 - 15.5	8.93 (12/12) 5.63-16.50	0
Shoreline Sediment[6] (pCi/kg dry)	K-40 (6)	None Required	18190 (3/3) 14890 - 23890	SED 4 km Downstream	18190 (3/3) 14890 - 23890	15960 (3/3) 13270 - 19010	0
	Cs-134 (6)	150	All <LLD			All <LLD	0

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
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Docket Number: 50-458
Reporting Period: 1/1/87 - 12/31/87

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations Mean (f)[2] Range	Location with Highest Annual Mean Name Dist./Dir.	Mean (f)[2] Range	Control Locations Mean (f)[2] Range	Number of Non-routine Reported Results
Shoreline Sediment[6] (pCi/kg dry)	Cs-137 (6)	180	54.90 (3/3) 22.50 - 99.40	SED 4 km Downstream	54.9 (3/3) 22.50 - 99.40	35.70 (3/3) 23.70 - 47.60	0
Fish/Invertebrates (pCi/kg wet)	K-40 (20)	None Required	3010 (11/12) 2060 - 4890	FD 4 km Downstream	3010 (11/12) 2060 - 4890	2800 (7/8) 1110 - 5190	0
	Mn-54 (20)	130	All <LLD			All <LLD	0
	Co-58 (20)	130	All <LLD			All <LLD	0
	Fe-59 (20)	260	All <LLD			All <LLD	0
	Co-60 (20)	130	All <LLD			All <LLD	0
	Zn-65 (20)	260	All <LLD			All <LLD	0
	Cs-134 (20)	130	All <LLD			All <LLD	0
	Cs-137 (20)	150	11.80 (2/12) 9.96 - 13.60	FD 4 km Downstream	11.80 (2/12) 9.96 - 13.60	All <LLD	0
Broadleaf Vegetation (pCi/kg wet)	Be-7 (106)	None Required	462 (38/72) 150 - 1260	GQC 35 km NW	737 (14/34) 84.7 - 3150	737 (14/34) 84.7 - 3150	0
	K-40 (106)	None Required	3430 (72/72) 1260 - 5920	GQC 35 km NW	4080 (34/34) 1740 - 10840	4080 (34/34) 1740 - 10840	0
	I-131 (106)	60	All <LLD			All <LLD	0
	Cs-134 (106)	60	All <LLD			All <LLD	0

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
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River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/87 - 12/31/87

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations[2] Mean (f) Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations[2] Mean (f) Range	Number of Nonroutine Reported Results
Broadleaf Vegetation (pCi/kg wet) (continued)	Cs-137 (106)	80	39.50 (3/72) 29.90 - 55.50	G1 1 km WNW	39.50 (3/72) 29.90 - 55.50	All <LLD	0

NOTES:

1. Lower Limit of Detection (LLD) as defined in RBS Technical Specifications (NUREG-1172).

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

3. Monthly gamma exposure estimates are "normalized" to a 30-day month and quarterly gamma exposure estimates are "normalized" to a 90-day quarter.

4. Delays in preparing and counting surface water samples for June 1987 were incurred during a program audit and resulted in failure to achieve the required LLDs for I-131. The detection limits achieved for I-131 in the June 1987 surface water samples were 20.2 pCi/liter for SWU; 15.8 pCi/liter for SWD; and 26.2 pCi/liter for the Discharge Line.

5. The upstream surface water sampling location (SWU) is used as a "control" for drinking water comparisons.

6. An upstream sediment sampling location, though not required, is used as a "control" for shoreline sediment comparisons. Cesium-137 was detected at both locations during spring and autumn of 1987, presumably as a consequence of runoff from areas affected by fallout from the accident at Chernobyl, Russia, in 1986.

3.1.4 Ingestion Exposure Pathway - Concentrations of radioiodine were below LLD in the ingestion pathways near RBS during 1987. In addition to naturally-occurring gamma emitters, Cs-137 was measured in both fish and broadleaf vegetation from indicator locations, averaging 11.8 pCi/kg-wet (<LLD) in downstream fish and 39.5 pCi/kg-wet (<LLD) in vegetation from the onsite garden in Sector P. These slightly elevated concentrations, which are two orders of magnitude below those that would be "reportable" if due to RBS releases, may be attributable to the Chernobyl incident.

3.2 Comparison of Operational and Baseline REMP Results

Radioiodine and other gamma emitters in the airborne exposure pathway were not measured at levels above the LLDs during 1987. Gross beta activities on air particulate filters averaged 0.03 pCi/cubic meter at both indicator and control locations in 1987, as they did during the preoperational phase of the REMP (Appendix A).

In the direct exposure pathway, the 1987 net average readings for monthly and quarterly TLDs from both indicator and control locations were slightly lower than the corresponding values for previous years. Thus far, no appreciable differences have been observed in TLD exposures between indicator and control locations or between the same locations from one year to the next.

In the waterborne exposure pathway, no gamma-emitting nuclides were measured above the RBS Technical Specification LLDs during 1987, as had been the case during the preoperational phase (Appendix A). Gross beta and tritium (H-3) levels in water are compared below:

WATERBORNE AVERAGE GROSS BETA (pCi/liter)

	Pre-operational	1986	1987
Surface Water, Upstream (4 km)	7.80	5.76	8.93
RBS Discharge Line	N/A	10.10	21.76
Surface Water, Downstream (4 km)	8.10	5.69	8.59
Drinking Water (Donaldsonville)	6.80	5.66	10.40
Upgradient Groundwater	6.00	2.25	2.22
Downgradient Groundwater	4.00	2.61	1.95

WATERBORNE AVERAGE TRITIUM (pCi/liter)

	Pre-operational	1986	1987
Surface Water, Upstream (4 km)	<2000	1582	1530
RBS Discharge Line	N/A	2365	2650
Surface Water, Downstream (4 km)	<2000	1699	1650
Drinking Water (Donaldsonville)	<2000	1609	1530
Upgradient Groundwater	<2000	1522	1610
Downgradient Groundwater	<2000	1597	1580

Gross beta activities in the Discharge Line, Surface Water samples, and the Drinking Water samples averaged slightly higher in 1987 than in previous years. These slightly increased levels of gross beta activity were well below the reporting levels established in RBS Technical Specifications. Moreover, they apparently reflect (at least in part) a slight general increase in levels of beta-emitting materials in the Mississippi River because what may be construed as the "indicator" location relative to RBS (SWD) had a slightly lower average than the "control" (SWU). Average levels of tritium activity in 1987 water samples were not appreciably different from those of previous years. It should be noted that Discharge Line monitoring results are based on composites of hourly aliquots of equal volume, rather than on flow-weighted hourly grabs. Although it may be argued that the long-term averages are fairly representative, it can be seen that the sampling requirement would be truly representative (especially for individual months) only if RBS liquid discharges were continuous at a constant rate, which is not the case (see also the discussion of liquid effluents under Section 3.3 below).

In the ingestion exposure pathway, no gamma-emitting nuclides were measured above LLDs during 1987, and there appear to have been no increases in radionuclide concentrations attributable to RBS operations in food/forage media over preoperational levels (Appendix A). Slight increases in Cs-137 levels in some fish and broadleaf vegetation samples, presumably related to residues of the Chernobyl accident fallout, were discussed in Section 3.1.4 (above). Naturally occurring K-40 was measured at an average of 3430 pCi/kg-wet in indicator vegetation and at an average of 4080 pCi/kg-wet in control vegetation during 1987, roughly the same levels encountered prior to RBS operation (Appendix A). Another natural nuclide, Be-7, was measured at 462 and 737 pCi/kg-wet in indicator and control vegetation samples, respectively, during 1987. Although presumably present, Be-7 was not quantified during the baseline phase for comparison.

3.3 Comparison of REMP Results with Operational Controls

The only measurable increases in concentrations of radionuclides or levels of radiation, attributable to plant operation, in the vicinity of RBS during 1987 appear to have been the expected low levels in the Discharge Line. The indicator versus control comparisons for airborne gross beta activity (Section 3.1.1; Table 5) corroborate the reports of limited or no releases of particulate or radioiodine in 1987. The 1987 environmental TLD data (Section 3.1.2; Table 5) showed no appreciable differences in direct radiation exposures between indicator and control locations. Excerpted liquid effluent data from the two Semiannual Radioactive Effluent Release Reports are listed in Table 6 along with the corresponding Discharge Line analytical data for those nuclides which which were measured by the REMP during 1987. These nuclide activities were measured at levels below the Technical Specification LLDs, but are listed here for comparison to substantiate the adequacy of source control and effluent monitoring at River Bend Station.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1987

TABLE 6

SUMMARY COMPARISON OF LIQUID EFFLUENT QUANTITIES/CONCENTRATIONS*
AND REMP DISCHARGE LINE MONITORING RESULTS

Quantities Released	1st Qtr. 1987	2nd Qtr. 1987	3rd Qtr. 1987	4th Qtr. 1987	Total 1987
Liters of Effluent	3.43E+6	7.48E+6	4.59E+6	9.24E+6	24.74E+6
Liters of Dilution	2.20E+8	4.69E+8	3.15E+8	5.94E+8	15.98E+8
Curies of H-3	9.26E-1	2.54E+0	1.48E+0	1.97E+0	6.916E+0
Curies of Mn-54	4.48E-4	4.05E-3	8.28E-4	3.56E-3	8.886E-3
Curies of Co-58	1.46E-3	2.37E-3	2.91E-3	1.59E-3	8.330E-3
Curies of Co-60	1.17E-3	3.48E-3	4.65E-3	8.09E-3	17.390E-3

Measured Nuclide	Predicted (Extrapolated) Concentrations (pCi/l) 1st Qtr. 1987	2nd Qtr. 1987	3rd Qtr. 1987	4th Qtr. 1987	Mean 1987	1987 REMP Mean (Range) pCi/l
H-3	4140	5330	4630	3270	4260	2650 (1990-3310)
Mn-54	2.01	8.50	2.59	5.90	5.48	4.67 (1.40-8.07)
Co-58	6.53	4.97	9.11	2.64	5.13	3.83 (2.08-5.63)
Co-60	5.24	7.30	14.50	13.40	10.70	6.29 (2.12-12.70)

*Effluent quantities and nuclide concentrations excerpted from the two 1987 Semiannual Radioactive Effluent Release Reports already submitted by River Bend Station.

APPENDIX A

Summary of Preoperational REMP (Baseline) Results

Table A.1 summarizes the results of preoperational radiological environmental monitoring from January, 1983, through October, 1985. Further details are available in the respective annual reports (1983, 1984, and 1985).

TABLE A.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
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River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/83 - 10/31/85

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations[2] Mean (f) Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations[2] Mean (f) Range	Number of Nonroutine Reported Results
Air Particulate (pCi/m^3)	Gross Beta (1086)	0.01	0.03 (752/759) 0.01 - 0.09	AQS2 5.8 km NW	0.03 (146/158) 0.01 - 0.09	0.03 (326/327) 0.01 - 0.08	N/A
	Cs-134 (95)	0.05	All <LLD			All <LLD	N/A
	Cs-137 (95)	0.06	All <LLD			All <LLD	N/A
Air Radioiodine (pCi/m^3)	I-131 (1086)	0.07	All <LLD			All <LLD	N/A
Direct (TLD) (mR Total)	Gamma Monthly (1214)		6.8 (1018/1064) 0.7 - 19.3	TM2 4.2 km WSW	7.8 (27/28) 3.2 - 16.2	6.7 (139/150) 0 - 27.8	N/A
	Gamma Quarterly (472)		19.0[3] (404/418) 6.8 - 32.1	TG1 1.6 km SE	27.5[3] (11/11) 12.2 - 27.6	18.9[3] (51/54) 6.5 - 23.5	N/A
Surface Water (pCi/liter)	H-3 (24)	2000	All <LLD			All <LLD	N/A
	Mn-54 (68)	15	All <LLD			All <LLD	N/A
	Co-58 (68)	15	All <LLD			All <LLD	N/A
	Fe-59 (68)	30	All <LLD			All <LLD	N/A
	Co-60 (68)	15	All <LLD			All <LLD	N/A
	Zn-65 (68)	30	All <LLD			All <LLD	N/A
	Nb-95 (68)	15	All <LLD			All <LLD	N/A

TABLE A.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
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River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/83 - 10/31/85

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations Mean (f)[2] Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations Mean (f)[2] Range	Number of Nonroutine Reported Results
Surface Water (pCi/liter) (continued)	Zr-95 (68)	30	All <LLD			All <LLD	N/A
	I-131 (68)	15	All <LLD			All <LLD	N/A
	Cs-134 (68)	15	All <LLD			All <LLD	N/A
	Cs-137 (68)	18	All <LLD			All <LLD	N/A
	Ba-140 (68)	60	All <LLD			All <LLD	N/A
	La-140 (68)	15	All <LLD			All <LLD	N/A
	Gross Beta (52)	4	8.1 (23/26) 4 - 12	SWD 4 km downstream	8.1 (23/26) 4 - 12	7.8 (24/26) 5 - 13	N/A
Groundwater[4] (pCi/liter)	H-3 (24)	2000	All <LLD			All <LLD	N/A
	Mn-54 (22)	15	All <LLD			All <LLD	N/A
	Co-58 (22)	15	All <LLD			All <LLD	N/A
	Fe-59 (22)	30	All <LLD			All <LLD	N/A
	Co-60 (22)	15	All <LLD			All <LLD	N/A
	Zn-65 (22)	30	All <LLD			All <LLD	N/A
	Nb-95 (22)	15	All <LLD			All <LLD	N/A

TABLE A.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 3 of 6)

River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/83 - 10/31/85

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations[2] Mean (f) Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations[2] Mean (f) Range	Number of Nonroutine Reported Results
Groundwater[4] (pCi/liter) (continued)	Zr-95 (22)	30	All <LLD			All <LLD	N/A
	I-131 (22)	15	All <LLD			All <LLD	N/A
	Cs-134 (22)	15	All <LLD			All <LLD	N/A
	Cs-137 (22)	18	All <LLD			All <LLD	N/A
	Ba-140 (22)	60	All <LLD			All <LLD	N/A
	La-140 (22)	15	All <LLD			All <LLD	N/A
	Gross Beta (15)	4	4 (5/12) 2 - 8	WD 470 m SW	4 (5/12) 2 - 8	6 (2/3) 3 - 9	N/A
Drinking Water[5] (pCi/liter)	H-3 (18)	2000	All <LLD			All <LLD	N/A
	Mn-54 (40)	15	All <LLD			All <LLD	N/A
	Co-58 (40)	15	All <LLD			All <LLD	N/A
	Fe-59 (40)	30	All <LLD			All <LLD	N/A
	Co-60 (40)	15	All <LLD			All <LLD	N/A
	Zn-65 (40)	30	All <LLD			All <LLD	N/A
	Nb-95 (40)	15	All <LLD			All <LLD	N/A

TABLE A.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 4 of 6)

River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/83 - 10/31/85

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations Mean (f)[2] Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations Mean (f)[2] Range	Number of Nonroutine Reported Results
Drinking Water[5] (pCi/liter) (continued)	Zr-95 (40)	30	All <LLD			All <LLD	N/A
	I-131 (40)	15	All <LLD			All <LLD	N/A
	Cs-134 (40)	15	All <LLD			All <LLD	N/A
	Cs-137 (40)	18	All <LLD			All <LLD	N/A
	Ba-140 (40)	60	All <LLD			All <LLD	N/A
	La-140 (40)	15	All <LLD			All <LLD	N/A
	Gross Beta (54)	4	6.8 (28/28) 3 - 12	Donaldson-ville 138 km downstream	6.8 (28/28) 3 - 12	7.8 (24/26) 5 - 13	N/A
Shoreline Sediment (pCi/kg dry)	K-40[6] (2)	None Required	13.7E3 (2/2) (11.4-15.9)E3	SED 4 km downstream	13.7E3(2/2) (11.4-15.9)E3	Not Required	N/A
	Cs-134 (4)	150	All <LLD				N/A
	Cs-137 (4)	180	All <LLD				N/A
Milk (pCi/liter)	K-40[6] (18)	None Required	1313 (8/9) 1179 - 1475	MF2 6 km ESE	1313 (8/9) 1179 - 1475	1318 (7/9) 1196 - 1409	N/A
	I-131 (81)	1	All <LLD			All <LLD[7]	N/A
	Cs-134 (82)	15	All <LLD			All <LLD[7]	N/A

TABLE A.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 5 of 6)

River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/83 - 10/31/85

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations Mean (f)[2] Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations Mean (f)[2] Range	Number of Nonroutine Reported Results
Milk	Cs-137 (82)	18	All <LLD			All <LLD[7]	N/A
(pCi/liter) (continued)	Ba-140 (82)	60	All <LLD			All <LLD[7]	N/A
	La-140 (82)	15	All <LLD			All <LLD[7]	N/A
Fish/Invertebrates (pCi/kg wet)	K-40[6] (6)	None Required	9037 (2/2) 6320 - 11754	FD 4 km downstream	9037 (2/2) 6320 - 11754	7840 (4/4) 4177 - 11438	N/A
	Mn-54 (15)	130	All <LLD			All <LLD	N/A
	Co-58 (15)	130	All <LLD			All <LLD	N/A
	Fe-59 (15)	260	All <LLD[8]			All <LLD[8]	N/A
	Co-60 (15)	130	All <LLD			All <LLD	N/A
	Zn-65 (15)	260	All <LLD			All <LLD	N/A
	Cs-134 (15)	130	All <LLD			All <LLD	N/A
	Cs-137 (15)	150	All <LLD			All <LLD	N/A
Broadleaf Vegetation (pCi/kg wet)	K-40[6] (11)	None Required	3368 (6/10) 1398 - 5389	G2 1.3 km NW	3368 (6/10) 1398 - 5389	3768 single value	N/A
	I-131 (75)	60	All <LLD[7]			All <LLD	N/A
	Cs-134 (76)	60	All <LLD			All <LLD	N/A

TABLE A.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 6 of 6)

River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/83 - 10/31/85

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection[1] (LLD)	All Indicator Stations[2] Mean (f) Range	Location with Highest Annual Mean Name Dist./Dir.	Location with Highest Annual Mean Mean (f)[2] Range	Control Locations[2] Mean (f) Range	Number of Nonroutine Reported Results
Broadleaf Vegetation (pCi/kg wet) (continued)	Cs-137 (76)	80	97 (4/43) 59 - 120	G1 1 km WNW	97 (4/43) 59 - 120	All <LLD	N/A

NOTES:

1. Lower Limit of Detection (LLD) as defined in RBS Technical Specifications (NUREG-1172).

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

3. For each of the TLD locations in 1985, a value equal to 1/3 of its 4th Quarter gamma dose is used to simulate a "quarterly" measurement for October, 1985.

4. Beginning in January, 1985, groundwater was sampled from one upgradient (WU - control) and one downgradient (WD - indicator) well; previously groundwater was sampled from construction dewatering wells.

5. The upstream surface water sampling location (SWU) is used as a "control" for drinking water analyses comparisons.

6. The values listed for K-40 were derived from the (then) incipient in-house analytical program.

7. The values listed for the control location for milk were derived from the (then) incipient in-house analytical program. Training of personnel in calibration and analytical methods delayed sample preparation and counting. As a result, the required LLDs were not met in 2 out of 8 I-131 analyses; 1 out of 9 Cs-134 analyses; 1 out of 9 Cs-137 analyses; 2 out of 9 Ba-140 analyses; and 4 out of 9 La-140 analyses. Similarly, the required LLD for I-131 in broadleaf vegetation was not met in 1 out of 11 analyses. (See discussion of Program Exceptions in Preoperational Radiological Environmental Monitoring Report for 1985.)

8. The LLD for one downstream fish sample (catfish, analyzed in-house) was 265 pCi/kg (wet). The LLD for one upstream fish sample (largemouth bass, analyzed in-house) was 263 pCi/kg (wet).

APPENDIX B

Meteorological Data Summaries, 1/19/87-2/2/87

The following tables and figures ("wind roses") summarize wind data recorded by the RBS meteorological monitoring system for late January and early February, 1987, during which time REMP air sampler AR1 (NNE Sector) was inoperable. The data are presented in support of Section 2.5 and Table 4 of the main body of the report.

SITE: RIVER BEND
UNIT: U1
USER: BEB
DATE: 3/11/87 12:44

JOINT FREQUENCY TABLE

ALL CLASSES -- DELTA-T

FROM 1/19/87 10:00 TO 1/26/87 8:00

PRIMARY SENSORS - 30 FOOT

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	2	3	0	0	0	0	0	5	5.6	3.9
NNE	0	3	6	0	0	0	0	0	9	10.0	3.6
NE	0	1	1	0	0	0	0	0	2	2.2	3.6
ENE	1	0	0	0	0	0	0	0	1	1.1	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	4	3	0	0	0	0	0	7	7.8	2.9
SE	0	2	7	0	0	0	0	0	9	10.0	5.1
SSE	0	0	4	4	0	0	0	0	8	8.9	7.3
S	0	0	3	1	0	0	0	0	4	4.4	5.8
SSW	0	0	6	0	0	0	0	0	6	6.7	5.8
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	4	1	0	0	0	0	0	5	5.6	3.1
WNW	0	4	4	3	0	0	0	0	11	12.2	5.3
NW	0	3	7	7	0	0	0	0	17	18.9	6.4
NNW	0	3	3	0	0	0	0	0	6	6.7	3.8
TOTAL	1	26	48	15	0	0	0	0	90	100.0	
%	1.1	28.9	53.3	16.7	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE: 5.0 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION: 0
NUMBER OF CALMS: 1
NUMBER OF INVALID HOURS: 77
NUMBER OF VALID HOURS: 90
TOTAL HOURS FOR THE PERIOD: 167
SPEED SENSOR: PS.SP.L
DIRECTION SENSOR: PS.DR.L
DELTA-T SENSOR: PS.DT.U-L

SITE: RIVER BEND
UNIT: U1
USER: BEB
DATE: 3/11/87 12:50

JOINT FREQUENCY TABLE

ALL CLASSES -- DELTA-T

FROM 1/19/87 10:00 TO 1/26/87 8:00

PRIMARY SENSORS - 150 FOOT

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	2	1	0	0	0	0	3	3.3	7.2
NNE	0	1	8	0	0	0	0	0	9	10.0	5.8
NE	0	0	3	2	0	0	0	0	5	5.6	6.9
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	3	0	0	0	0	3	3.3	10.1
SE	0	0	1	10	0	0	0	0	11	12.2	10.1
SSE	0	0	1	5	1	0	0	0	7	7.8	10.5
S	0	0	0	5	0	0	0	0	5	5.6	9.4
SSW	0	0	1	6	0	0	0	0	7	7.8	8.7
SW	0	0	0	1	0	0	0	0	1	1.1	11.6
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	4	0	0	0	0	4	4.4	8.5
WNW	0	0	5	5	0	0	0	0	10	11.1	8.0
NW	0	0	3	10	1	0	0	0	14	15.6	10.0
NNW	0	0	7	3	1	0	0	0	11	12.2	7.9
TOTAL	0	1	31	55	3	0	0	0	90	100.0	
%	0.0	1.1	34.4	61.1	3.3	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE: 8.7 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION: 0
NUMBER OF CALMS: 0
NUMBER OF INVALID HOURS: 77
NUMBER OF VALID HOURS: 90
TOTAL HOURS FOR THE PERIOD: 167
SPEED SENSOR: PS.SP.U
DIRECTION SENSOR: PS.DR.U
DELTA-T SENSOR: PS.DT.U-L

SITE: RIVER BEND
UNIT: U1
USER: BEB
DATE: 3/11/87 12:53

JOINT FREQUENCY TABLE

ALL CLASSES -- DELTA-T

FROM 1/26/87 9:00 TO 2/ 2/87 10:00

PRIMARY SENSORS - 30 FOOT

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	1	6	2	0	0	0	0	0	9	5.4	2.2
NNE	1	8	1	0	0	0	0	0	10	6.0	2.1
NE	3	4	0	0	0	0	0	0	7	4.2	1.4
ENE	0	0	3	0	0	0	0	0	3	1.8	5.9
E	0	1	2	0	0	0	0	0	3	1.8	3.9
ESE	1	2	7	0	0	0	0	0	10	6.0	3.8
SE	0	3	10	1	0	0	0	0	14	8.3	4.5
SSE	2	1	12	11	0	0	0	0	26	15.5	6.6
S	0	2	7	4	0	0	0	0	13	7.7	6.2
SSW	0	2	4	6	2	0	0	0	14	8.3	7.7
SW	0	1	6	5	0	0	0	0	12	7.1	7.3
WSW	0	2	1	1	0	0	0	0	4	2.4	4.7
W	0	3	4	0	0	0	0	0	7	4.2	3.5
WNW	0	4	2	0	0	0	0	0	6	3.6	3.2
NW	2	1	4	4	0	0	0	0	11	6.5	5.6
NNW	1	3	9	6	0	0	0	0	19	11.3	5.5
TOTAL	11	43	74	38	2	0	0	0	168	100.0	
%	6.5	25.6	44.0	22.6	1.2	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE: 5.1 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION: 0
NUMBER OF CALMS: 11
NUMBER OF INVALID HOURS: 2
NUMBER OF VALID HOURS: 168
TOTAL HOURS FOR THE PERIOD: 170
SPEED SENSOR: PS.SP.L
DIRECTION SENSOR: PS.DR.L
DELTA-T SENSOR: PS.DT.U-L

SITE: RIVER BEND
UNIT: U1
USER: BEB
DATE: 3/11/87 12:54

JOINT FREQUENCY TABLE

ALL CLASSES -- DELTA-T

FROM 1/26/87 9:00 TO 2/ 2/87 10:00

PRIMARY SENSORS - 150 FOOT

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	1	4	5	0	0	0	0	10	6.0	7.1
NNE	2	0	4	5	0	0	0	0	11	6.5	6.3
NE	2	0	1	4	0	0	0	0	7	4.2	5.9
ENE	1	0	0	3	0	0	0	0	4	2.4	7.1
E	1	1	3	0	0	0	0	0	5	3.0	3.8
ESE	1	0	3	8	0	0	0	0	11	6.5	8.9
SE	0	0	1	11	0	0	0	0	12	7.1	9.6
SSE	1	0	4	9	5	0	0	0	19	11.3	9.7
S	0	0	2	14	1	0	0	0	17	10.1	9.7
SSW	0	3	5	4	1	0	0	0	13	7.7	7.1
SW	0	0	2	6	8	0	0	0	16	9.5	12.3
WSW	0	0	2	0	0	0	0	0	2	1.2	7.3
W	0	0	6	2	1	0	0	0	9	5.4	7.2
WNW	0	0	5	1	0	0	0	0	6	3.6	5.9
NW	0	0	0	6	0	0	0	0	6	3.6	10.4
NNW	3	1	0	14	2	0	0	0	20	11.9	8.2
TOTAL	10	6	42	92	18	0	0	0	168	100.0	
%	6.0	3.6	25.0	54.8	10.7	0.0	0.0	0.0	100.0		

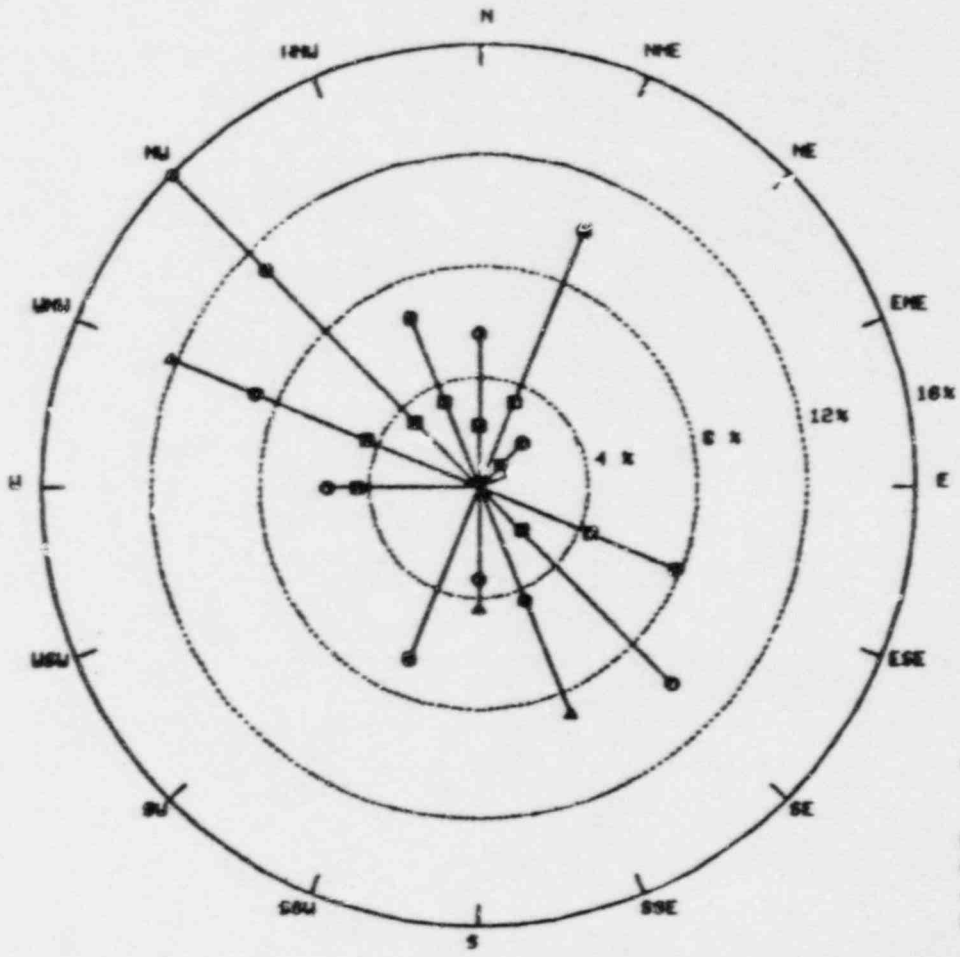
AVE SPEED FOR THIS TABLE: 8.5 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION: 0
NUMBER OF CALMS: 10
NUMBER OF INVALID HOURS: 2
NUMBER OF VALID HOURS: 168
TOTAL HOURS FOR THE PERIOD: 170
SPEED SENSOR: PS.SP.U
DIRECTION SENSOR: PS.DR.U
DELTA-T SENSOR: PS.DT.U-L

SITE: RIVER BEND
UNIT: U1
USER: BEB
DATE: 3/11/87 13:46

WORKSPACE METEOROLOGICAL DATA
START DATE: 1/19/87 10: 0
END DATE: 1/26/87 8: 0

SPEED SENSOR: PS.SP.L
DIRECTION SENSOR: PS.DR.L

WIND ROSE (WINDS FROM)



* DATA GREATER THAN 16%

B WIND SPEEDS LESS THAN 3.5 MPH
@ WIND SPEEDS LESS THAN 7.5 MPH
A WIND SPEEDS LESS THAN 12.5 MPH
N WIND SPEEDS LESS THAN 150.0 MPH

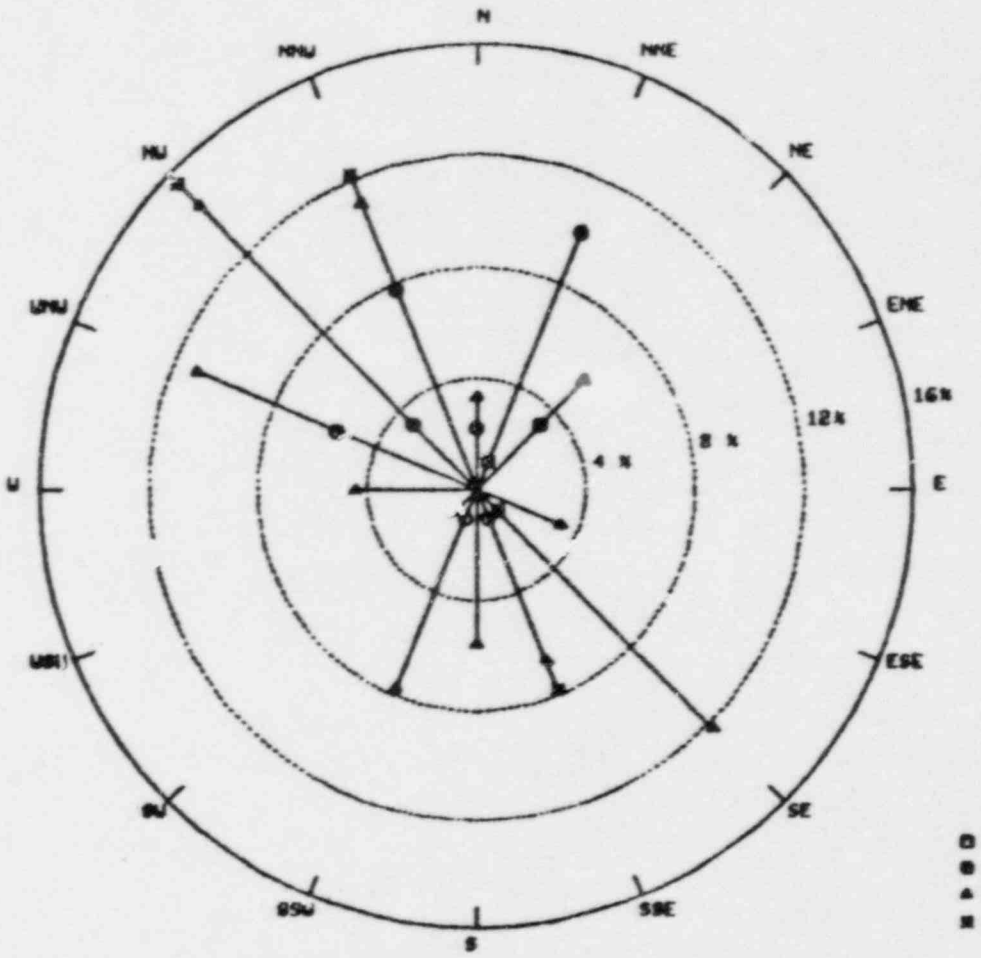
1.1 PERCENT CALMS, I.E. SPEEDS
LESS THAN 0.6 MPH

SITE: RIVER BEND
UNIT: U1
USER: BEB
DATE: 3/1:/87 13:46

WORKSPACE METEOROLOGICAL DATA
START DATE: 1/19/87 10: 0
END DATE: 1/26/87 8: 0

SPEED SENSOR: PS.SP.U
DIRECTION SENSOR: PS.DR.U

WIND ROSE (WINDS FROM)



⊡ WIND SPEEDS LESS THAN 3.5 MPH
⊕ WIND SPEEDS LESS THAN 7.5 MPH
▲ WIND SPEEDS LESS THAN 12.5 MPH
⊠ WIND SPEEDS LESS THAN 150.0 MPH

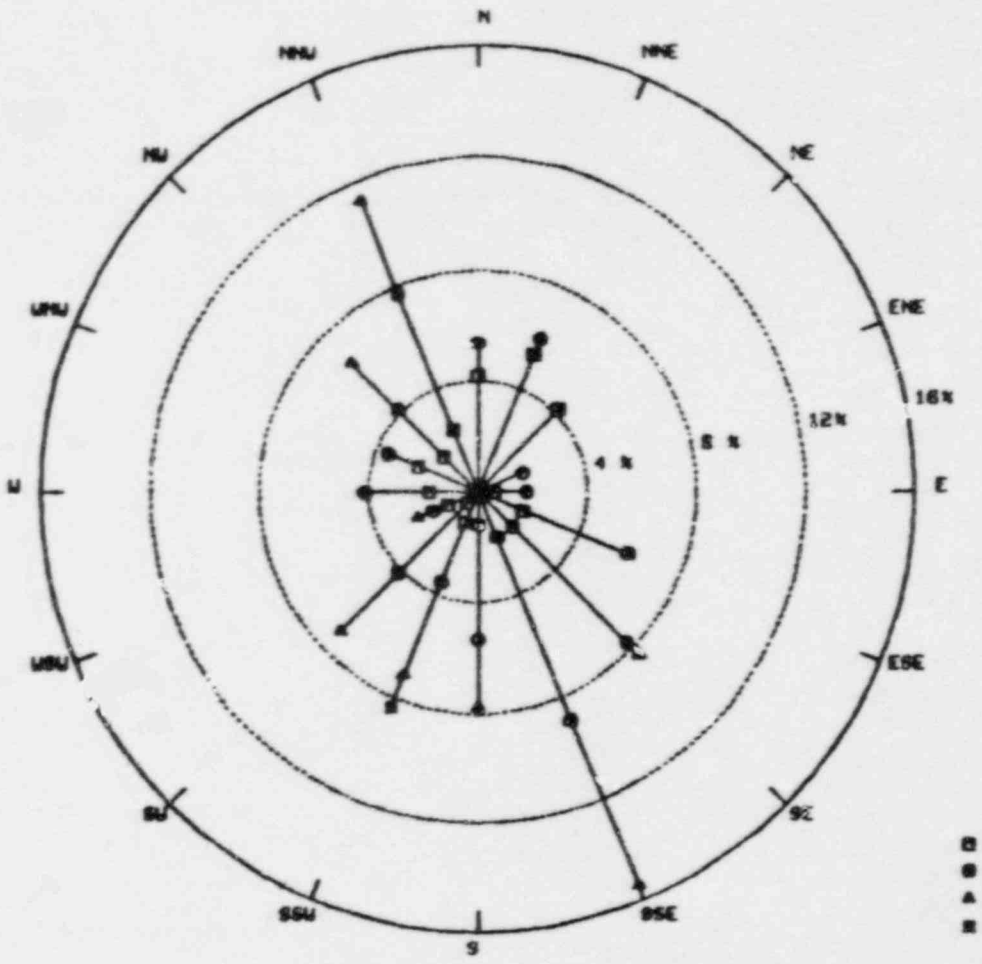
0.0 PERCENT CALMS, I.E. SPEEDS LESS THAN 0.5 MPH

SITE: RIVER BEND
UNIT: U1
USER: BEB
DATE: 3/11/87 13:46

WORKSPACE METEOROLOGICAL DATA
START DATE: 1/26/87 0: 0
END DATE: 2/ 2/87 10: 0

SPEED SENSOR: PS.SP.L
DIRECTION SENSOR: PS.DR.L

WIND ROSE (WINDS FROM)



- WIND SPEEDS LESS THAN 3.5 MPH
- WIND SPEEDS LESS THAN 7.5 MPH
- WIND SPEEDS LESS THAN 12.5 MPH
- WIND SPEEDS LESS THAN 150.0 MPH

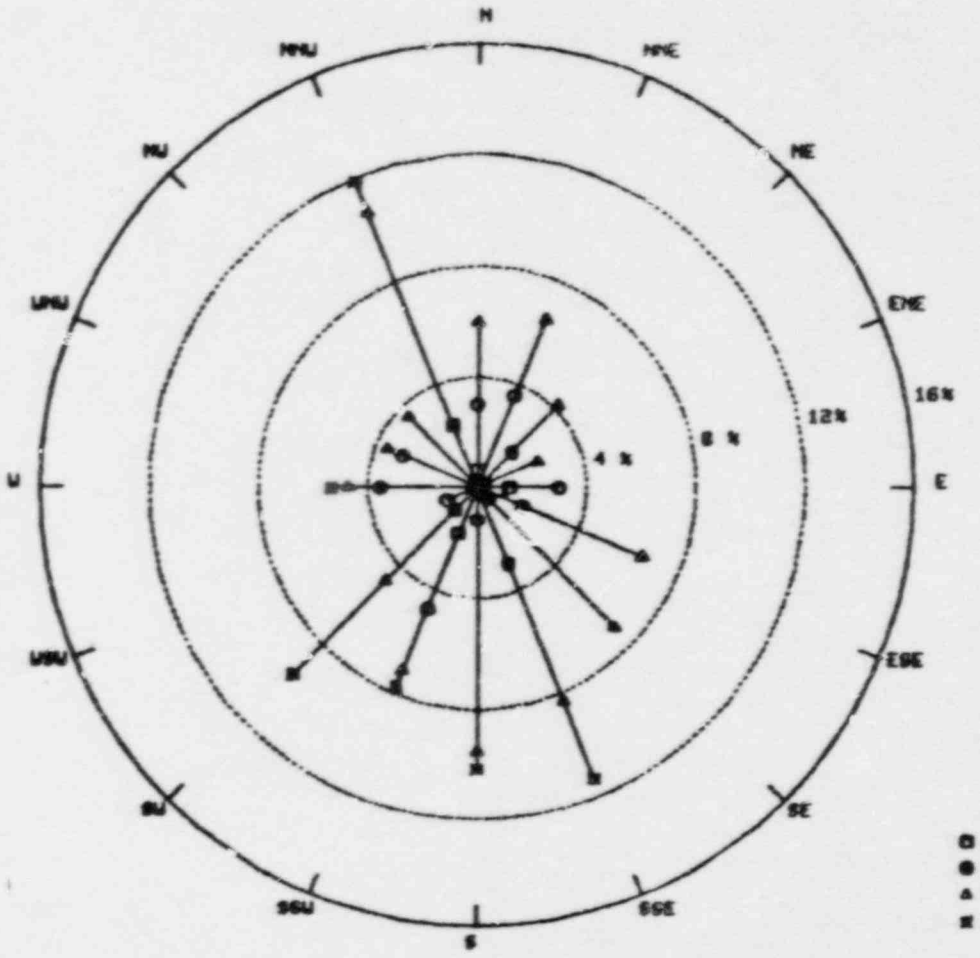
6.5 PERCENT CALMS, I.E. SPEEDS LESS THAN 0.0 MPH

SITE: RIVER BEND
UNIT: U1
USER: BEB
DATE: 3/11/87 13:47

WORKSPACE METEOROLOGICAL DATA
START DATE: 1/26/87 9: 0
END DATE: 2/ 2/87 10: 0

SPEED SENSOR: PS.SP.U
DIRECTION SENSOR: PS.DR.U

WIND ROSE (WINDS FROM)



□ WIND SPEEDS LESS THAN 3.5 MPH
● WIND SPEEDS LESS THAN 7.5 MPH
△ WIND SPEEDS LESS THAN 12.5 MPH
✕ WIND SPEEDS LESS THAN 150.0 MPH

6.6 PERCENT CALMS, I.E. SPEEDS
LESS THAN 0.8 MPH

GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775

AREA CODE 504 635-6094 346-8651

April 29, 1988
RPG- 27782
File Nos. G9.5, G9.25.1.4

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Gentlemen:

River Bend Station - Unit 1
Docket No. 50-458

Enclosed is the Annual Radiological Environmental Operating Report for the period of January 1 through December 31, 1987. This report is submitted in accordance with Technical Specification 6.9.1.7 of Appendix A to River Bend Station (RBS) License Number NPF-47.

Sincerely,

J. E. Booker

J.E. Booker
Manager-River Bend Oversight
River Bend Nuclear Group

JEB/LAE/JVC/JWC/ch

Enclosure

cc: U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

NRC Resident Inspector
P.O. Box 1051
St. Francisville, LA 70775

IE48
1/1