GULF STATES UTILITIES COMPANY
RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775
AREA CODE 504 635-6094 346-8651

April 30, 1991
RBG- 34,917
File Nos. G9.5, G9.25.1.5

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 1990. This report is submitted in accordance with Subsection 6.9.1.7 of Appendix A (Technical Specifications) to River Bend Station License Number NPF-47.

Sincerely,

for W. H. Odell
Manager - Oversight
River Bend Nuclear Group

LAE/MAH/pj

Enclosure

cc: Mr. Robert D. Martin, Regional Administrator
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

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

RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

RIVER BEND STATION

FOR THE OPERATING PERIOD

January 1, 1990 - December 31, 1990

Compiled by:

McGehee Reed
Rad. Environmental Analyst

Edited by:

Michael A. Harrington
Supvr. - Environmental Services

Reviewed by:

Edwin M. Cargill
Director - Radiological Programs

Approved by:

Philip D. Graham
Plant Manager

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

Abstract

During 1990, 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 97.4 percent of analytical results within control limits. The land use census revealed 4 salient changes in receptor locations since 1989, and the census was expanded to add meat animal receptor locations within the 8 km range. Seventeen monitoring exceptions occurred out of a total effort of 1754 samples collected and 2339 subsequent analyses performed. Fourteen of these exceptions involved Technical Specification requirements, although none had significant impact on program quality. Although well below the required detection limits, slightly elevated (relative to baseline data) levels of Cesium-137 were sporadically measured in both indicator and control media; these concentrations were presumably attributable to the 1986 incident at Chernobyl, Russia. The only measurable increases in radionuclide activity or levels of radiation attributable to plant operation, in the vicinity of RBS during 1990, appear to have been expected low levels in the liquid discharge line and traces of airborne I-131 due to small amounts of failed fuel in the boiler-reactor. The levels of activity measured in airborne media and in the liquid discharge were below the required LLDs and hence substantially below Technical Specification reporting levels. Thus the 1990 Radiological Environmental Monitoring Program substantiated the adequacy of source control and effluent monitoring at River Bend Station.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

TABLE OF CONTENTS

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

This Annual Radiological Environmental Operating Report for the period of January 1 through December 31, 1990, 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 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 all or portions 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 1990, 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 maintaining/calibrating air samplers and in reading/annealing thermoluminescence dosimeters.

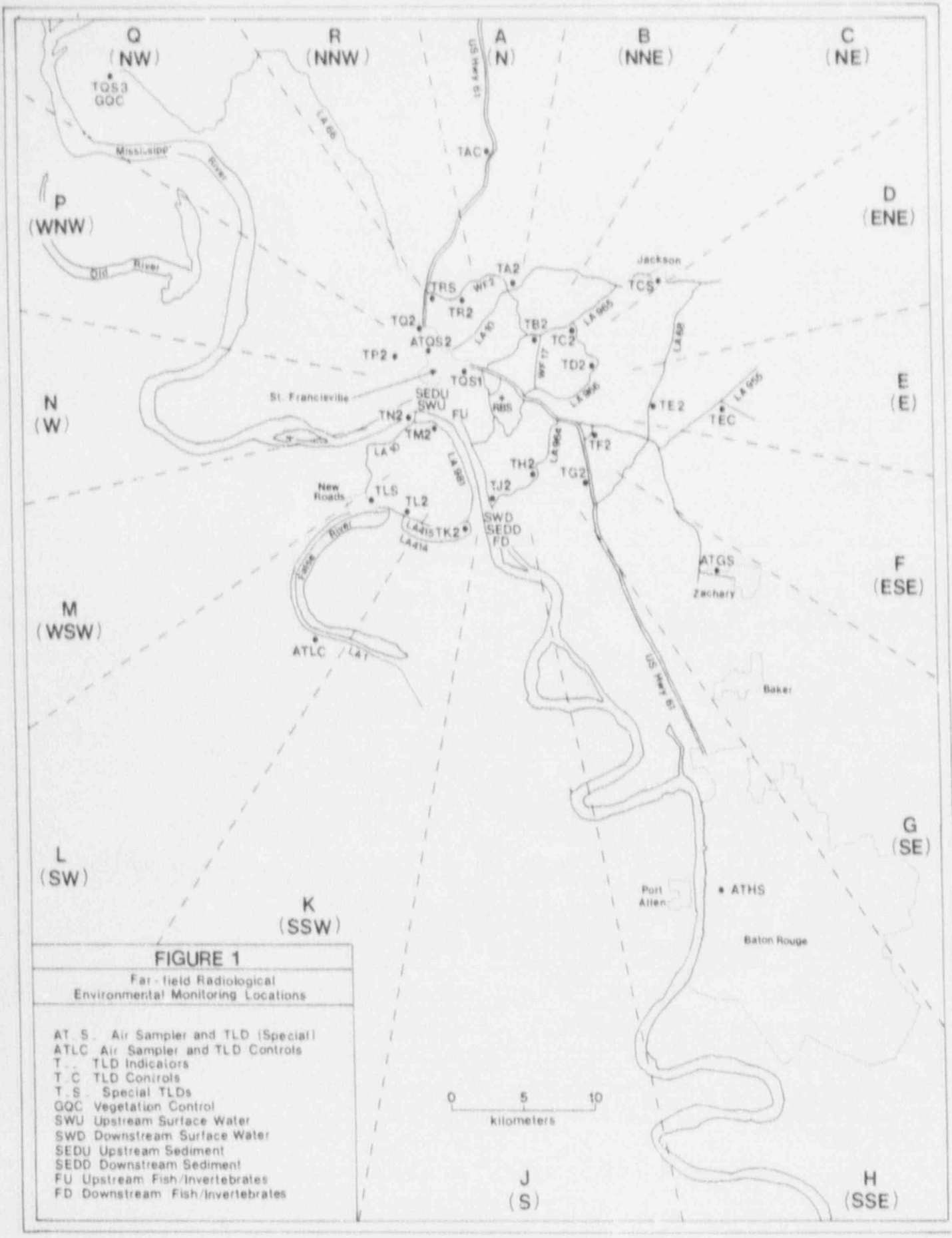

FIGURE 1

Far-field Radiological Environmental Monitoring Locations

AT_S Air Sampler and TLD (Special)
ATLC Air Sampler and TLD Controls
T_I 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

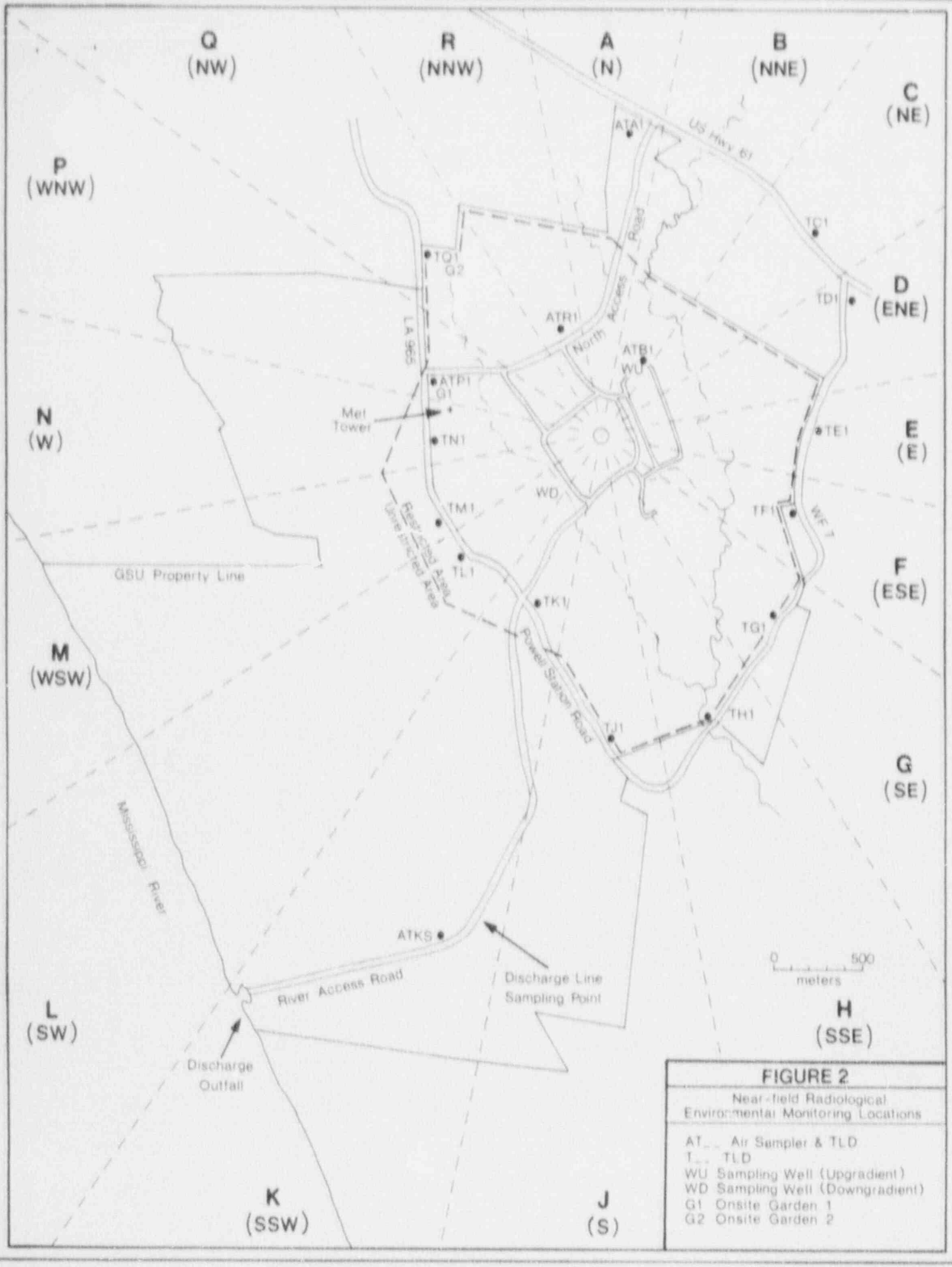

FIGURE 2

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 of 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 vs. control and preoperational vs. 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 NRC 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 (external)	Air Samples (Particulates and Radioiodines)
	Ingestion Dose (internal)	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 Dose (internal)	Surface Water Samples Groundwater Sample Drinking Water Samples Fish/Invertebrate Samples Shoreline Sediment Samples
Immersion Dose (external)	Surface Water Samples Shoreline Sediment Samples

Site-related dispersion characteristics, demography, hydrology, 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 incorporates all of the elements in the RBS Technical Specifications (3/4.12.1, 3/4.12.2, 3/4.12.3) plus special study criteria, and is illustrated in Table 1 and Figures 1 and 2.

2.3 Land Use Census for 1990

The annual land use census was conducted during the 1990 growing season in accordance with RBS Technical Specification 3/4.12.2. Table 2 summarizes the results and notes changes in nearest receptor locations within 8 km from those identified in the Radiological Environmental Operating Report for 1989.

The 1990 census identified residences within 8 km of the RBS reactor containment in all sectors except L (SW) and M (WSW). The nearest resident in sector M (WSW) was beyond 8 km in 1990 versus 4.3 km in 1989, and the nearest resident in sector P (WNW) was at 3.7 km in 1990 versus 4.1 km in 1989. In sector E (E), the garden identified in 1989 was discontinued, and in sector H (SSE) a new garden was established for 1990. 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 1990 census. Historically, there had never been enough dairy sites to accommodate the minimum RBS Technical Specification requirements for analysis of milk (3 locations within 5 km), so monitoring of broadleaf vegetation has been performed from the outset.

GSU began a survey of meat animals within the 8 km radius of RBS during the 1990 census. This initial survey identified beef herds in all sectors except L (SW).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
(Page 1 of 5)

Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analyses
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 filter: analysis weekly for gross beta and gamma isotopic activity (3) following filter changes. Composite particulate filters: analysis quarterly for gamma isotopic activity.
	AR1. River Bend Station North Access Road across from plant entrance; 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 (nearest community location).	"	"
	CONTROL AND SPECIAL INTEREST STATIONS (1)		
	ALC. Parlange Power Center in Oscar; 20 km SW (Control).	"	"
	AB1. River Bend Station cooling tower yard; 0.5 km NNE. (2)	"	"
	AKS. River Bend Station River Access Road; 2.8 km SSW. (2)	"	"
	AGS. GSU Service Center compound in Zachary; 17 km SE. (2)	"	"
	AHS. Roof of GSU Office Building, North Blvd., Baton Rouge; 40 km SSE. (2)	"	"
Direct 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 cooling tower yard; 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.	"	"

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
(Page 2 of 5)

Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analyses
Direct Radiation (continued)	TD2. Stub pole along La. Hwy. 966, 4 km S. of Jct. La. Hwys. 966 and 965; 6.3 km ENE.	Thermoluminescence dosimeters (TLDs); deployment/retrieval monthly and quarterly. (3)	Gamma dose monthly and quarterly. (3)
	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.	"	"
	TF1. Stub pole along WF 7, 1.6 km S. of Jct. WF 7 and US Hwy. 61; 1.3 km ESE.	"	"
	TF2. On La. Hwy. 954, 0.6 km N. of Jct. La. 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 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 #L10175 on La. Hwy. 965, 20 m S. of RBS River Access Road; 0.9 km SSW.	"	"
	TK2. Stub pole at Jct. La. Hwys. 414 and 415; 8 km SSW.	"	"
	TL1. Second utility pole on La. Hwy. 965 S. of former ICG RR crossing; 1.0 km SW.	"	"
	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 La. Hwy. 965 N. of former ICG 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 La. Hwy. 965, between RBS 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.	"	"

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
(Page 3 of 5)

Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analyses
Direct Radiation	TP1. Near River Bend Station onsite Garden #1; 0.9 km WNW.	Thermoluminescence dosimeters (TLDs); deployment/retrieval monthly and quarterly. (3)	Gamma dose monthly and quarterly. (3)
	TP2. Stub pole about 1.5 km N. of former ICG ER trestle on Tunica Street, western outskirts of St. Francisville; 7.3 km WNW.	"	"
	TQ1. GSU property sign along La. Hwy. 965 about 1 km N. of RBS 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.	"	"
	TR1. RBS North Access Road across from plant entrance; 0.8 km ONW.	"	"
	TR2. Tree along north side of WF 2, past Jacock Road, about 1.8 km E. of Jct. WF 2 and US Hwy. 61; 8 km NNW.	"	"
	CONTROL AND SPECIAL INTEREST STATIONS (1)		
	TAC. Telephone pole along US Hwy. 61 about 200 m N. of Hamilton Station Water Tower, near Wakefield; 18 km N.	"	"
	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. (2)	"	"
	TLC. Parlange Power Center in Oscar; 20 km SW.	"	"
	TCS. Utility pole at gate to East Louisiana State Hospital in Jackson; 12.3 km NE.	"	"
	TGS. GSU Service Center compound in Zachary; 17 km SE.	"	"
	THS. Roof of GSU Office Building, North Blvd., Baton Rouge; 40 km SSE.	"	"
	TKS. RBS River Access Road; 2.8 km SSW. (2)	"	"
	TLS. Utility pole near False River Academy sign at edge of New Roads; 9.9 km SW.	"	"
	TQS1. Behind Pentecostal Church (opposite West Feliciana Hospital) near Jct. US Hwy. 61 and Ferdinand Street; 4 km NW.	"	"
	TQS2. St. Francis Substation on US Hwy. (Business) 61 in St. Francisville; 5.8 km NW.	"	"
	TQS3. Utility pole at Louisiana State Penitentiary dairy, near Angola; 35 km NW. (2)	"	"
	TRS. Stub pole at Jct. of WF 2 and US Hwy. 61, near Bains (West Feliciana High School); 9.2 km NNW. (2)	"	"

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
(Page 4 of 5)

Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analyses
Waterborne	SURFACE WATER (4)		
	SWU. Mississippi River about 4 km upstream from the RBS liquid discharge, near La. Hwy. 10 ferry crossing.	Weekly grabs composited over monthly and quarterly periods.	Monthly composite: gamma isotopic, tritium (3) and gross beta analysis (5). Quarterly composite: tritium analysis.
	SWD. Mississippi River about 4 km downstream from RBS liquid discharge, near paper mill.	"	"
	DL. RBS liquid discharge line line at blowdown control structure along River Access Road.	Hourly grabs composited monthly and quarterly.	"
	DRINKING WATER (6)		
	Nearest downstream water supply: IH-10 bridge in Baton Rouge, 53.9 km downstream from RBS liquid discharge; People's Water Service Company in Donaldsonville, 138 river km downstream from RBS liquid discharge.	Weekly grabs composited over monthly and quarterly periods.	Monthly composite: gamma isotopic, tritium (3) and gross beta analysis (5). Quarterly composite: tritium analysis.
	GROUNDWATER		
	WD. Upland Terrace Aquifer well downgradient from plant, about 470 m SW.	Quarterly grab.	Gross beta, gamma isotopic and tritium analysesc 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 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. (2)	"	"
Ingestion	FISH AND INVERTEBRATES		
	FD. One sample of each of three commercially and/or recreationally important species from downstream area influenced by RBS liquid discharge. (7)	Semiannually or seasonally when available.	Gamma isotopic analysis on edible portion, semiannually or seasonally.
	FU. One sample of each of three commercially and/ or recreationally important species from upstream area not influenced by RBS liquid discharge (control). (7)	"	"
	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 average ground-level D/Q; 1 km WSW and 1.1 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).	"	"

TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
(Page 5 of 5)

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 to 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 (Macrobrachium ohione), blue catfish (Ictalurus furcatus), and freshwater drum (Aplodinotus grunniens); if these 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 and analyzed because of limited availability of milk samples.

TABLE 2

RESULTS OF LAND USE CENSUS

Sector	Nearest Residence	Range (km)	Nearest Garden	Range (km)	Nearest Dairy	Range (km)	Nearest Meat Animal[1]	Range (km)
A (N)	Jones	1.8	Jones	1.8	-	-	Davis	1.9
B (NNE)	Dreher	1.6	Harvey	1.8	-	-	Harvey	1.8
C (NE)	Magee	1.5	Magee	1.5	-	-	Daniel, H.	1.7
D (ENE)	Lambert	1.4	Daniel, E.I.	1.6	-	-	Lambert	1.6
E (E)	Bickham	2.2	-[2]	-	-	-	Daniel, E.I.	1.2
F (ESE)	Shelton	3.4	Eisworth	3.6	-	-	Daniel, E.I.	1.2
G (SE)	Mills	6.6	Mills	6.6	-	-	Bickham	3.5
H (SSE)	Koffman	1.7	Koffman[3]	1.7	-	-	Daniel, E.I.	3.9
J (S)	Bliss	1.8	Bliss	1.8	-	-	Daniel, E.I.	3.5
K (SSW)	Guillory	7.4	Guillory	7.4	-	-	Daniel, E.I.	3.5
L (SW)	-	-	-	-	-	-	-	-
M (WSW)	-[2]	-	-	-	-	-	Langois	5.0
N (W)	Lacost	6.1	-	-	-	-	Langois	5.0
P (WNW)	Dietrich[4]	3.7	GSU #1	1.0	-	-	Hardovin	7.4
Q (NW)	Rimmer	1.3	GSU #2	1.1	-	-	Cavin	1.3
R (NNW)	Young[5]	1.7	Monroe	3.0	-	-	Klein	2.4

[1] The initial survey for meat animal location was performed in 1990.

[2] The 1989 receptor location was discontinued for 1990.

[3] There was no receptor location listed for 1989.

[4] The 1990 receptor location was nearer than the receptor location listed in 1989.

[5] The 1990 receptor location was farther than the receptor location listed in 1989.

2.4 Interlaboratory Comparison Program Results for 1990

The Environmental Services Group participated in the U.S. Environmental Protection Agency (USEPA) Laboratory Intercomparison Program during 1990 in accordance with RBS Technical Specification 3/4.12.3. RBS results (Table 3) were within the warning limits for the normalized range (precision) for all analyses, and within the USEPA "known" value (accuracy) for all but two analyses, namely, the gross beta in water for 9/21/90 and the total potassium in milk for 4/27/90. The discrepancies for the gross beta in water for 9/21/90 and for potassium in milk for 4/27/90 are discussed below. The USEPA discontinued the cross-check media for "food" in 1989, and although milk sampling and analysis is not required of RBS at this time, the results for the cross-check media for "milk" are included as a gauge for the "food" sample analyses (i.e., vegetation and fish) performed by RBS.

2.5 Program Exceptions

Certain samples and analyses were inadvertently omitted or unavoidably altered during the 1990 operating period, out of a total effort of 1754 samples collected and 2339 subsequent analyses performed. 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.

Brief storm-related power outages impacted one indicator air sampler (AA1) in January, five indicator and special interest air samplers (AA1, AB1, AR1, AKS, and AP1) in June, and one control air sampler (ALC) in August. From 3 percent to 20 percent of each of the expected sample volumes was lost due to the power outages. A fractured (cause unknown) electrical service pole which supports the weatherhead and breaker box for the AKS air sampler necessitated disconnection of power, further impacting AKS during November and December. The time taken to replace the electrical service to AKS, a sampling location not required by RBS Technical Specifications, resulted in the loss of approximately 83 percent of the expected sample volume for AKS over a 5 week period. These losses are not deemed to have had a significant impact on program quality, especially since the plant was shut down for a refueling outage from October to December, 1990.

Limited variety in the crops due to a hard freeze during the winter months at the state penitentiary (GQC) and both site gardens resulted in failure to obtain 3 out of 36 required control samples and 3 out of 72 required indicator samples of broadleaf vegetation during 1990. This did not significantly impact program quality. One of the samples obtained from the control location (GQC) in June did not satisfy the LLD requirements due to its low mass.

One USEPA cross-check analysis for gross beta in water, dated 9/21/90, was outside the control limits for accuracy. The sample activity reported by RBS had been calculated using an incorrect factor for salt density attenuation of beta counting efficiency. When the activity of the gross beta sample was recalculated with the correct salt density factor, the result was well within the limits for accuracy. One USEPA cross-check analysis for total potassium was outside the control limits for accuracy. The mass for potassium reported by RBS had been converted from K-40 activity using the incorrect conversion factor (1.19 instead of 1.133).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

TABLE 3

USEPA INTERCOMPARISON (CROSS-CHECK) PROGRAM PARTICIPATION RESULTS

SAMPLE TYPE (units) Participants[d]	DATE	ANALYSIS	USEPA "KNOWN" VALUE[a]	RBS VALUE	RBS N-DEV[b]	RBS N-RANGE[c]	AVERAGE RESULT (All)
AIR FILTER	3/30/90	Beta	31.00±5.80	33.67	+0.92	0.354	32.19±3.68
(pCi/filter)	3/30/90	Cs-137	10.00±5.80	12.00	+0.69	0.000	11.56±2.05
	8/31/90	Beta	62.00±5.80	69.33	+2.54	0.354	64.66±6.77
	8/31/90	Cs-137	20.00±5.80	23.00	+1.04	0.354	22.70±3.61
MILK[e]	4/27/90	I-131	99.00±11.60	100.67	+0.29	0.354	98.49±8.13
	4/27/90	Cs-137	24.00±5.80	24.33	+0.12	0.473	24.65±3.03
	4/27/90	K (nat)	1550.00±90.30	(1647.00)[f]	(+2.15)	(0.409)	1548.38±117.33
WATER	1/26/90	Beta	12.00±5.80	14.[illegible]	+0.69	0.000	12.91±2.[illegible]2
(pCi/liter)	2/09/90	Co-60	15.00±5.80	15.00	+0.00	0.236	15.[illegible]±2.28
	2/09/90	Zn-65	139.00±16.20	149.00	+1.24	0.338	[illegible]9.93±9.60
	2/09/90	Ru-106	139.00±16.20	134.33	-0.58	0.464	[illegible]60±14.22
	2/09/90	Ba-133	74.00±8.10	74.33	+0.08	0.169	[illegible].9±6.21
	2/09/90	Cs-134	18.00±5.80	17.67	-0.12	0.11[illegible]	17.00 2.14
	2/09/90	Cs-137	18.00±5.80	19.33	+0.46	0.1[illegible]	[illegible]3.40
	2/23/90	H-3	4976±575	4844	-0.46	0.152	491[illegible] 840.99
	4/17/90	Beta	52.00±5.80	51.00	-0.35	0.945	4[illegible]6±6.39
	4/17/90	Cs-134	15.00±5.80	13.67	-0.46	0.11[illegible]	14.44±1.77
	4/17/90	Cs-137	15.00±5.80	15.67	+0.12	0.1[illegible]8	15.80±1.88
	5/11/90	Beta	15.00±5.80	15.00	+0.00	0.23[illegible]	16.16±3.85
	6/08/90	Co-60	24.00±5.80	25.67	+0.58	0.118	5.12±2.69
	6/08/90	Zn-65	148.00±17.40	159.67	+1.35	0.118	[illegible]9.18±12.30
	6/08/90	Ru-106	210.00±24.30	195.00	-1.24	0.647	201.01±17.01
	6/08/90	Ba-133	99.00±11.60	102.00	+0.52	0.000	96.33±8.16
	6/08/90	Cs-134	24.00±5.80	2[illegible]0	+0.00	0.000	23.26±2.10
	6/08/90	Cs-137	25.00±5.80	2[illegible]7	+0.58	0.118	26.21±2.61
	6/22/90	H-3	2933±141.4	2847.67	-0.41	0.206	2966.80±285.64
	8/10/90	I-131	[illegible].00±6.90	36.67	-0.67	0.295	40.26±4.10
	9/[illegible]1/90	Beta	10.00±5.80	(13.00)[f]	(+1.04)	(0.236)	10.91±2.25
	10/05/90	Co-60	20.00±5.80	22.00	+0.69	0.000	20.53±2.53
	10/05/90	Zn-65	115.00±13.90	126.00	+1.59	0.345	116.25±9.89
	10/05/90	Ru-106	151.00±17.40	147.00	-0.46	0.158	140.39±15.33
	10/05/90	Ba-133	110.00±12.70	111.67	+0.26	0.107	107.73±9.22
	10/05/90	Cs-134	12.00±5.80	11.67	-0.12	0.118	11.89±2.09
	10/05/90	Cs-137	12.00±5.80	13.67	+0.58	0.118	13.11±2.17
	10/19/90	H-3	7203.00±833.50	7403.67	+0.48	0.480	7125.08±671.93
	10/30/90	Beta	53.00±5.80	53.33	+0.12	0.945	50.78±6.32
	10/30/90	Cs-134	7.00±5.80	7.00	+0.00	0.000	7.49±1.44
	10/30/90	Cs-137	5.00±5.40	4.67	-0.12	0.118	5.94±1.55

NOTES:

(a) USEPA "known" values are listed with a range reflecting control (3 sigma) limits.

(b) The normalized deviation from the "known" value is computed by USEPA from the deviation and the standard error of the mean; +2.000 is the warning limit and +3.000 is the control limit.

(c) The normalized range is computed by USEPA from the mean range, the control limit, and the standard error of the range; +2.000 is the warning limit and +3.000 is the control limit.

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

(e) USEPA discontinued the cross-check media "Food" for 1989. Although milk sampling and analysis by RBS is not performed, the cross-check samples of milk were analyzed, and the data included as a gauge of the "food" sample (i.e. vegetation, fish) analyses performed by RBS. The units for the nuclides I-131 and Cs-137 are pCi/liter, and for the element K is mg/liter.

(f) The results reported to USEPA were calculated with incorrect correction/conversion factors. The appropriate values are reported here with the values for "normalized deviation from the known value" and for "normalized range" calculated by RBS personnel.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

TABLE 4

MONITORING PROGRAM EXCEPTIONS

Sample Type	Period	Location	Exception/Reason
Air Particulates and Radioiodines	1/02 - 1/09/90 1/09 - 1/16/90	AA1	About 20% of normal weekly sample volume not collected due to power outage.
"	5/29 - 6/04/90	AA1, AB1*, AR1, AKS*, AP1	About 8% of normal weekly sample volumes not collected due to power outage.
"	6/04 - 6/11/90	AA1, AB1*, AR1, AKS*, AP1	About 4% of normal weekly sample volumes not collected due to power outage.
"	7/30 - 8/06/90	ALC	About 3% of normal weekly sample volume not collected due to power failure.
"	8/20 - 8/27/90	ALC	About 16% of normal weekly sample volume not collected due to power failure.
"	11/12 - 11/19/90	AKS*	About 58% of normal weekly sample volume not collected due to power outage (electric service torn loose from the step-down transformer on the utility pole).
"	11/19 - 12/20/90	AKS*	None of normal weekly sample volume was collected due to power outage (electric service had to be re-strung from the transformer).
Broadleaf Vegetation	January	GQC	Only one (1) of three (3) samples obtained due to limited availability caused by hard freeze.
"	January	G-2	Only two (2) of three (3) samples obtained due to limited availability caused by hard freeze.
"	March	GQC	Only two (2) of three (3) samples obtained due to limited availibility.
"	March	G-1	Only one (1) of three (3) samples obtained due to limited availibility.
"	June	GQC	One (1) sample of three (3) analyzed failed the LLD requirement.
Fish and Invertebrates	Spring/Summer 1990	FU	Only two (2) of three (3) samples obtained due to limited availability.
Water, Gross Beta	April	CWS	Results varied by more than 10% on a split sample.
USEPA Cross-check, Gross Beta in Water	9/21/90	N/A	Results calculated using incorrect salt density factor for attenuation of beta counting efficiency; correct activity was obtained when correct factor used in calculation.
Water	10/17 - 10/24/90	CWS	About 58% of hourly composite aliquots not obtained due to power outage.
Direct Radiation (TLD)	June	TKS*	The recorded high net normalized gamma dose, possibly due to severe moisture damage and corrosion observed in microscopic examination of the dosimeter's phosphor elements.

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

3.0 INTERPRETATION OF REMP RESULTS

3.1 Summary of Operational REMP Results

Monitoring results for the exposure pathways are itemized in Appendix A and 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 are 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 LLDs - that is, "undetectable" at the required analytical sensitivities. During the two week period from 5/21/90 to 6/4/90, traces of radioiodine and noble gasses were measured at three downwind air sample stations, due to the presence of a small amount of failed fuel in the reactor. The releases resulting from this failed fuel were minimized by operational controls (e.g., repairing minor steam leaks), after which no further measurements of radioiodine and noble gasses were observed at any of the air sampling stations. This fuel was removed during the refueling outage in the 4th quarter of 1990. Gross beta activities averaged 0.025 pCi/m^3 at indicator locations and 0.02[illegible] pCi/m^3 at control locations.

3.1.2 Direct Exposure Pathway - The monthly average gamma exposure for indicator and control locations were 4.20 and 4.35 millir[illegible] respectively. Quarterly exposures averaged 12.39 mR total at indicator locations and 12.90 mR total at control locations.

3.1.3 Waterborne Exposure Pathway - No gamma-emitters were measured in surface water or in drinking water at levels approaching the Technical Specification LLDs. The gamma emitters Mn-54, Co-58, Fe-59, Co-60, Nb-95, Zr-95, Cs-134 & 137, and Ba-140 were measured in a few monthly composite samples from the discharge line DL at concentrations between 0.9 and 56 picocuries per liter. Gross beta activities in surface water averaged 40.4 pCi/l in the discharge line DL and from 3 to 17 pCi/l at all other stations. Tritium (H-3) activities in surface water averaged 20450 pCi/l in the discharge line DL and were below detection limits at all other locations. Gross beta activities averaged 4.7 and 6.0 pCi/l in the downgradient WD (indicator) and upgradient WU (control) groundwater, respectively. Besides naturally-occurring gamma emitters, Cs-137 was measured in Mississippi River shoreline sediment above (75 pCi/kilogram dry) and below (10 pCi/kg dry) the RBS liquid discharge outfall. As in the case of the airborne Cs-137 activity, these slightly elevated levels (relative to baseline conditions) are probably attributable to the 1986 incident at Chernobyl, Russia.

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 1 of 4)

River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/90 -12/31/90

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 (468)	0.01	0.025 (308/312) 0.018 - 0.052	AR1 0.5 km NNE	0.026 (52/52) 0.021 - 0.032	0.020 (156/156) 0.008-0.028	0
	Be-7[3] (468)	NONE REQUIRED	0.121 (282/312) 0.057 - 0.244	AR1 0.8 km NNW	0.137 (45/52) 0.077 - 0.249	0.111 (125/156) 0.057-0.222	0
	K-40[3] (468)	NONE REQUIRED	0.58 (309/312) 0.233 - 2.270	AK5 2.8 km SSW	0.649 (48/52) 0.253 - 2.270	0.52 (153/156) 0.212-0.858	0
	Cs-134 (468)	0.05	ALL <LLD			ALL <LLD	0
	Cs-137 (468)	0.06	0.012 (4/312) 0.009 - 0.015	AR1 0.8 km NNW	0.015 (1/52) single value	0.013 (1/52) single value	0
Air Radioiodine (pCi/m^3)	I-131 (468)	0.07	0.020 (5/312) 0.016 - 0.031	AR1 0.8 km NNW	0.024 (2/52) 0.016 - 0.031	ALL <LLD	0
Direct (TLD)[4] (mR Total)	Gamma Monthly (456)		4.20 (456/456) 2.39 - 11.17	TM2 4.2 km WSW	4.98 (12/12) 4.06 - 6.03	4.35(72/72) 3.24 - 5.54	0
	Gamma Quarterly (176)		12.39 (152/152) 7.81 - 17.37	TM2 4.2 km WSW	14.49(4/4) 13.52 - 15.49	12.90(24/24) 10.31-15.98	0
Surface Water (pCi/liter)	H-3 (12)	3000	20452 (4/8) 5705 - 35450	DL	20452 (4/4) 5705- 35450	ALL <LLD	0
	Mn-54 (36)	15	8.05 (12/24) 1.19 - 24.8	DL	8.05 (12/12) 1.19 - 24.8	ALL <LLD	0
	Co-58 (36)	15	3.68 (11/24) 1.01 - 10.7	DL	3.68 (11/12) 1.01 - 10.7	ALL <LLD	0
	Fe-59 (36)	30	4.70 (6/24) 1.77 - 8.44	DL	4.70 (6/12) 1.77 - 8.44	ALL <LLD	0
	Co-60 (36)	15	19.4 (12/24) 2.85 - 55.5	DL	19.4 (12/12) 2.85 - 55.5	ALL <LLD	0
	Zn-65 (36)	30	All < LLD)			ALL <LLD	0
	Nb-95 (36)	15	3.36 (2/24) 2.56 - 4.16	DL	3.36 (2/36) 2.56 - 4.16	ALL <LLD	0
	Zr-95 (36)	30	1.03 (1/24) (single value)	DL	1.03 (1/12) single value	ALL <LLD	0
	I-131 (36)	15	ALL <LLD			ALL <LLD	0
	Cs-134 (36)	15	1.16 (2/24) 0.91 - 1.41	DL	1.16 (2/12) 0.91 - 1.41	ALL <LLD	0
	Cs-137 (36)	18	1.04 (2/24) 0.92 - 1.16	SWU 4 km upstream	1.14 (1/12) single value	1.14 (1/12) single value	0
	Ba-140 (36)	60	1.46 (1/24) (single value)	DL	1.46 (1/12) single value	ALL <LLD	0

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 2 of 4)

River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/90 -12/31/90

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)	La-140 (36)	15	ALL <LLD			ALL <LLD	0
	Gross Beta (36)	4	24.96(24/24) 3.36 - 49.87	DL	40.39 (12/12) 20.69 - 49.87	9.75 (12/12) 5.00 - 14.32	0
Groundwater (pCi/liter)	H-3 (8)	3000	ALL <LLD			ALL <LLD	0
	Mn-54 (8)	15	ALL <LLD			ALL <LLD	0
	Co-58 (8)	15	ALL <LLD			ALL <LLD	0
	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 (10)	4	4.73 (4/5) 3.02 - 5.73	WU 470 m NNE	6.03 (3/5) 5.25 - 6.89	6.03 (3/5) 5.25 - 6.89	0
Drinking Water[5] (pCi/liter)	H-3 (4)	3000	ALL <LLD			ALL <LLD	0
	Mn-54 (12)	15	ALL <LLD			ALL <LLD	0
	Co-58 (12)	15	ALL <LLD			ALL <LLD	0
	Fe-59 (12)	30	ALL <LLD			ALL <LLD	0

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 3 of 4)

River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/90 -12/31/90

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
Drinking Water[5] (pCi/liter) (continued)	Co-60 (12)	15	1.60 (1/12) (single value)	Donaldsonville 138 km downstream	1.60 (1/12) (single value)	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	0.61 (1/12) (single value)	SWU 4 km upstream	1.14 (1/12) (single value)	1.14 (1/12) single value	0
	Ba-140 (12)	60	ALL <LLD			ALL <LLD	0
	La-140 (12)	15	ALL <LLD			ALL <LLD	0
	Gross Beta (12)	4	9.47 (12/12) 4.53 - 14.36	SWU 4 km upstream	9.75 (12/12) 5.00 - 14.32	9.75 (12/12) 5.00 - 14.32	0
Shoreline Sediment[6] (pCi/kg dry)	Be-7[3] (4)	NONE REQUIRED		SEDU 4 km upstream	408 (1/2) (single value)	408 (1/2) single value	N/A
	K-40[3] (4)	NONE REQUIRED	14115 (2/2) 13706 - 14524	SEDD 4 km downstream	14115 (2/2) 13706 - 14524	10567 (2/2) 4773-16361	N/A
	Cs-134 (4)	150	ALL <LLD			ALL <LLD	0
	Cs-137 (4)	180	10.0 (1/2) (single value)	SEDU 4 km upstream	74.6 (1/2) (single value)	74.6 (1/2) single value	0
Fish/ Invertebrates (pCi/kg wet)	K-40[3] (13)	NONE REQUIRED	3181 (8/8) 2637 - 4081	FD 4 km downstream	3181 (8/8) 2637 - 4081	2949 (5/5) 1977 - 3506	0
	Mn-54 (13)	130	ALL <LLD			ALL <LLD	0
	Co-58 (13)	130	ALL <LLD			ALL <LLD	0
	Fe-59 (13)	260	ALL <LLD			ALL <LLD	0
	Co-60 (13)	130	ALL <LLD	FU 4 km upstream	7.49 (1/5) (single value)	7.49 (1/5) single value	0
	Zn-65 (13)	260	ALL <LLD			ALL <LLD	0

TABLE 5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 4 of 4)

River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/90 -12/31/90

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
Fish/ Invertebrates (pCi/kg wet) (continued)	Cs-134 (13)	130	ALL <LLD			ALL <LLD	0
	Cs-137 (13)	160	7.07 (1/8) (single value)	FD 4 km downstream	7.07 (1/8) (single value)	1.67 (1/5) single value	0
Broadleaf Vegetation (pCi/kg wet)	Be-7[3] (98)	NONE REQUIRED	310 (44/69) 71 - 2040	GQC 35 km NW	547 (21/29) 56 - 2292	547 (21/29) 56 - 2292	N/A
	K-40[3] (98)	NONE REQUIRED	3503 (69/69) 1616 - 5794	GQC 35 km NW	4374 (29/29) 1926 - 8287	4374 (29/29) 1926 - 8287	N/A
	I-131 (98)	60	ALL <LLD			ALL <LLD	0
	Cs-134 (98)	60	ALL <LDD			ALL <LLD	0
	Cs-137 (98)	80	20.0 (5/69) 15.8 - 27.6	G1 1 km WNW	20.0 (5/34) 15.8 - 27.6	11.6 (1/29) single value	0
	Ba-140 (98)	NONE REQUIRED	47.2 (1/69) (single value)	G1 1 km WNW	47.2 (1/34) (single value)	NONE MEASURED	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. Specific activities found for certain common and readily distinguished, naturally occurring nuclides are included to provide perspective. It should also be noted that other gamma emitting, naturally occurring nuclides (e.g., primordial series) are often detected but not reported because of the complexities and uncertainties of specific identification.

3.1.4 Ingestion Exposure Pathway - Specific activities for radioiodine were below the required LLD in the ingestion pathway monitoring media during 1990. In addition to naturally-occurring gamma emitters, Cs-137 was measured in both broadleaf vegeta-tion and fish from the indicator locations, and in fish from the control location. The Cs-137 averaged 20.0 pCi/kg wet (<LLD) in vegetation from [illegible] garden in Sector P (G1), a single measurement of 7.07 pCi/kg wet was [illegible] a downstream fish, and a single measurement of 1.67 pCi/kg wet noted in [illegible] fish. These slightly elevated Cs-137 activities, which are two orders of [illegible]ude below those that would be "reportable" if due to RBS releases, are probably 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 required LLDs during 1990. Gross beta activities on air particulate filters averaged 0.025 pCi/m^3 at indicator and 0.020 pCi/m^3 at control locations in 1990, compared to 0.03 pCi/m^3 at both indicator and control locations during the preoperational phase of the REMP (Appendix B).

In the direct exposure pathway, the 1990 net average readings for monthly and quarterly TLDs from both indicator and control locations were slightly lower than the corresponding values for the baseline period. Thus far, no appreciable differerences 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, average activities analyzed for required gamma-emitting nuclides were measured below the RBS Technical Specification LLDs during 1990 as had been the case during the preoperational phase (Appendix B). Gross beta and tritium levels in water are compared below:

WATERBORNE AVERAGE GROSS BETA (pCi/l)

	Pre-operational	1986	1987	1988	1989	1990
Surface Water, Upstream (4 km)	7.80	5.76	8.93	9.30	7.79	9.75
RBS Discharge Line	N/A	10.10	21.76	32.38	32.05	40.39
Surface Water, Downstream (4 km)	8.10	5.69	8.59	8.66	7.41	9.52
Drinking Water (Donaldsonville)	6.80	5.66	10.40	8.24	8.23	9.47
Upgradient Groundwater	6.00	2.25	2.22	2.45	3.61	6.03
Downgradient Groundwater	4.00	2.61	1.95	2.20	3.44	4.73

WATERBORNE AVERAGE TRITIUM (pCi/l)

	Pre-operational	1986	1987	1988	1989	1990
Surface Water, Upstream (4 km)	<3000	<452	<444	<588	<554	<209
RBS Discharge Line	N/A	1023	1140	2272	3469	20452
Surface Water, Downstream (4 km)	<3000	<454	<604	<592	<554	<209
Drinking Water (Donaldsonville)	<3000	<462	<593	<586	<557	<210
Upgradient Groundwater	<3000	<446	<601	<780	<881	<211
Downgradient Groundwater	<3000	<448	<600	<779	<872	<207

3.1.4 Ingestion Exposure Pathway - Specific activities for radioiodine were below the required LLD in the ingestion pathway monitoring media during 1990. In addition to naturally-occurring gamma emitters, Cs-137 was measured in both broadleaf vegetation and fish from the indicator locations, and in fish from the control location. The Cs-137 averaged 20.0 pCi/kg wet (<LLD) in vegetation from the onsite garden in Sector P (G1), a single measurement of 7.07 pCi/kg wet was noted in a downstream fish, and a single measurement of 1.67 pCi/kg wet noted in upstream fish. These slightly elevated Cs-137 activities, which are two orders of magnitude below those that would be "reportable" if due to RBS releases, are probably 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 required LLDs during 1990. Gross beta activities on air particulate filters averaged 0.025 pCi/m^3 at indicator and 0.020 pCi/m^3 at control locations in 1990, compared to 0.03 pCi/m^3 at both indicator and control locations during the preoperational phase of the REMP (Appendix B).

In the direct exposure pathway, the 1990 net average readings for monthly and quarterly TLDs from both indicator and control locations were slightly lower than the corresponding vaiues for the baseline period. Thus far, no appreciable differerences 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, average activities analyzed for required gamma-emitting nuclides were measured below the RBS Technical Specification LLDs during 1990 as had been the case during the preoperational phase (Appendix B). Gross beta and tritium levels in water are compared below:

WATERBORNE AVERAGE GROSS BETA (pCi/l)

	Pre-operational	1986	1987	1988	1989	1990
Surface Water, Upstream (4 km)	7.80	5.76	8.53	[illegible]	7.79	9.75
RBS Discharge Line	N/A	10.10	21.76	[illegible]	32.05	40.39
Surface Water, Downstream (4 km)	8.10	5.69	8.59	[illegible]	7.41	9.52
Drinking Water (Donaldsonville)	6.80	5.66	10.40	[illegible]	6.23	9.47
Upgradient Groundwater	6.00	2.25	2.22	[illegible]	3.61	6.03
Downgradient Groundwater	4.00	2.61	1.95	[illegible]	3.44	4.73

WATERBORNE AVERAGE TRITIUM (pCi/l)

	Pre-operational	1986	1987	1988	1989	1990
Surface Water, Upstream (4 km)	<3000	<452	<444	<588	<554	<209
RBS Discharge Line	N/A	1023	1140	2272	3469	20452
Surface Water, Downstream (4 km)	<3000	<454	<604	<592	<554	<209
Drinking Water (Donaldsonville)	<3000	<462	<593	<586	<557	<210
Upgradient Groundwater	<3000	<446	<601	<780	<881	<211
Downgradient Groundwater	<3000	<448	<600	<779	<872	<207

Gross beta activities in the discharge line and surface water samples averaged slightly higher in 1989 and 1990 than in previous years, yet the levels remained well below reporting levels established in the RBS Technical Specifications. These activities seemingly reflect (at least in part) a slight general increase in levels of beta-emitting materials in the Mississippi River. As observed in previous years, the annual average gross beta activity for the control location (SWU) was higher than that for the indicator location (SWD).

Tritium activities in the discharge line increased on average, reflecting the releases already noted in the 1990 Semiannual Radioactive Effluent Release Reports (see also Table 6). In the RBS boiler-reactor, tritium is produced by ternary fission of the reactor fuel (^{235}U), although only a small fraction of that tritium would diffuse through the fuel's cladding. Tritium is also produced by neutron reactions with certain isotopes of boron, deuterium and lithium when present in the boiler (e.g. as control rod material - boron). The observed tritium increase in the liquid discharge is attributable to the small amounts of failed fuel (i.e. defects in a very small percentage of the fuel cladding - also responsible for the airborne radioiodine), allowing that tritium produced by ternary fission to migrate into the boiler water. The tritium activity observed during 1990 increased beginning in May and continued through November, tapering off with the removal of the failed fuel (see Appendix A, page A-12). Smaller increases of tritium in the liquid discharge would result from more efficient radioactive wastewater treatment and reuse (e.g., as boiler makeup). The particulates (metals and salts) are removed in this treatment leaving the tritium behind as water (e.g., [^{3}H-O-^{1}H]). When this water is reused as boiler makeup, tritium builds up in the water.

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. While it may be argued that the long-term averages are fairly representative, it can be seen that the sampling requirement would be truly representative only if RBS liquid discharges were continuous and at a constant rate, which is not the case (see also the discussion of liquid effluents under Section 3.3 below). RBS changed to flow-weighted composite sampling of the discharge line in 1991 to accomodate NPDES permit requirements for biomonitoring. This change should have a beneficial impact on the comparisons made for predicted releases versus REMP measurements in Table 6.

In the ingestion exposure pathway, no gamma emitting nuclides were measured above LLDs during 1990, and there appear to have been no increases in radionuclide concentrations attributable to RBS operation in food/forage media over baseline levels (Appendix B). 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 3503 pCi/kg in indicator vegetation and at an average of 4374 pCi/kg in control vegetation in 1990, roughly the same levels encountered prior to

RBS operation (Appendix B). Another natural nuclide, Be-7, averaged 310 and 547 pCi/kg in indicator and control vegetation samples, respectively, during 1990. Although presumably present, Be-7 was not quantified during the preoperational phase for comparison.

3.3 Comparison of REMP Results with Operating Controls

The only measurable increases in concentrations of radionuclides or levels of radiation, attributable to plant operation, in the vicinity of RBS during 1990 appear to have been the expected low levels in the liquid Discharge Line. The indicator vs. control comparisons for airborne gross beta activity (Section 3.1.1; Table 5 and Appendix A) corroborate the reports of limited or no releases of particulates or radioiodine in 1990. The 1990 TLD data (Section 3.1.2; Table 5 and Appendix A) 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 were measured by the REMP during 1990. These nuclide activities were well below the NRC reporting levels, 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 1990

TABLE 6

SUMMARY COMPARISON OF LIQUID EFFLUENT QUANTITIES/ACTIVITIES[a]
AND REMP DISCHARGE LINE MONITORING RESULTS

Quantities Released	1st Qtr. 1990	2nd Qtr. 1990	3rd Qtr. 1990	4th Qtr. 1990	Total 1990
Liters, effl.	2.93E+06	3.65E+06	5.22E+06	4.92E+06	1.67E+07
Liters, dil.	1.14E+09	1.51E+09	1.31E+09	1.08E+09	5.04E+09
H-3, Curies	4.31E+00	1.84E+01	4.01E+01	2.07E+01	8.35E+01
Cr-51, Curies	4.76E-02	8.09E-02	1.55E-01	8.21E-02	3.66E-01
Mn-54, Curies	1.34E-02	1.39E-02	1.09E-02	8.03E-03	4.62E-02
Co-58, Curies	9.76E-03	7.07E-03	3.97E-03	2.71E-03	2.35E-02
Fe-59, Curies	8.05E-03	4.50E-03	4.24E-03	3.18E-03	2.00E-02
CO-60, Curies	2.87E-02	3.01E-02	3.26E-02	2.21E-02	1.14E-01
Nb-95, Curies	3.36E-04	3.91E-04	1.39E-03	1.10E-03	3.22E-03
Zr-95, Curies	6.92E-05	1.69E-04	1.01E-03	7.77E-04	2.03E-03
Ba-140, Curies	-	-	1.96E-04	2.87E-04	2.42E-04

Measured Nuclide	Predicted (Extrapolated) Specific Activities (pCi/l) 1st Qtr. 1990	2nd Qtr. 1990	3rd Qtr. 1990	4th Qtr. 1990	Mean 1990	1990 REMP Mean (Range) pCi/l
H-3	3771	12516	30489	19080	16374	21156 (3575-60410)[b] 20452 (5705-35450)[c]
Cr-51	41.6	53.4	118	75.7	72.2	68.5 (12.1-195)
Mn-54	11.1	9.18	8.29	7.65	9.06	8.05 (1.19-24.8)
Co-58	8.53	4.67	3.02	2.50	4.68	3.68 (1.01-10.7)
Fe-59	7.04	2.97	3.22	2.93	4.04	4.70 (1.77-8.44)
Co-60	25.1	19.9	24.8	20.4	22.6	19.4 (2.85-55.5)
Nb-95	0.29	0.26	1.06	1.01	0.66	3.36 (2.56-4.16)
Zr-95	0.06	0.11	0.77	0.72	0.42	1.03(single value)
Ba-140	-	-	0.15	0.26	0.21	1.46(single value)

[a] Effluent quantities and nuclide activities excerpted from the two 1990 Semiannual Radioactive Effluent Release Reports already submitted.

[b] Results from monthly composites. [c] Results from quarterly composites.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

APPENDIX A

Listings of 1990 REMP Results

The following tables list individual analytical results and direct measurements of radiation (TLD exposures) recorded by the Radiological Environmental Monitoring Program (REMP) during 1990. Activities measured for certain common and readily distinguished, naturally occurring nuclides are included to provide perspective. It should be noted that other gamma emitting, naturally occurring nuclides (e.g., primordial series) were often detected but are not listed because of the complexities and uncertainties of specific identifications.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Air Particulate Filter Gross Beta Activity (E-2 pCi/m^3) - 1990

WEEK ENDING	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/08/90	2.19	1.89	1.79	1.81	2.08	1.96	2.08	1.87	1.68
01/15/90	2.90	2.86	2.59	2.79	2.78	2.61	2.62	3.24	2.48
01/22/90	1.47	1.73	1.46	1.50	1.43	1.47	1.53	1.69	1.49
01/29/90	1.44	1.73	1.71	1.47	1.70	1.68	1.54	1.82	1.64
02/05/90	1.77	2.00	2.00	1.90	2.04	1.82	1.69	1.76	2.03
02/12/90	1.85	1.94	1.84	2.17	2.14	1.93	2.01	1.74	1.83
02/20/90	1.83	2.13	1.82	2.05	2.06	1.98	2.03	1.96	1.90
02/26/90	1.42	1.68	1.42	1.61	1.54	1.75	1.64	1.33	1.69
03/05/90	2.07	1.84	2.13	2.32	1.95	2.11	1.25	1.77	2.09
03/12/90	1.76	1.84	2.36	2.34	2.06	1.90	1.89	1.90	2.03
03/19/90	1.62	2.12	1.87	2.12	1.93	1.77	1.78	1.96	1.82
03/26/90	2.13	2.80	2.52	2.64	2.33	2.10	2.38	2.29	2.29
04/02/90	1.71	2.16	2.19	2.05	1.77	1.61	1.80	1.68	1.85
04/09/90	2.00	2.26	2.19	2.34	2.16	1.85	2.14	1.87	2.16
04/16/90	1.73	2.37	2.09	2.24	1.88	2.16	0.76	2.32	1.23
04/23/90	1.98	2.23	2.01	2.20	1.93	1.41	1.85	1.87	2.17
04/30/90	2.05	2.55	2.16	2.28	2.02	1.60	1.93	1.89	2.20
05/07/90	2.18	2.29	2.28	2.16	2.09	1.45	2.02	2.02	2.18
05/14/90	2.04	2.27	2.36	1.79	1.94	1.43	1.77	1.83	1.97
05/21/90	2.11	2.36	2.28	2.37	1.86	1.24	1.56	1.97	2.01
05/29/90	1.99	2.05	2.03	1.87	1.87	1.12	1.59	1.77	1.70
06/04/90	3.06	2.98	3.12	2.87	2.84	2.64	2.18	2.59	2.52
06/11/90	1.83	1.86	1.75	1.59	1.62	1.63	1.31	0.74	1.42
06/18/90	1.68	1.88	2.11	1.91	2.02	1.84	1.40	1.41	1.66
06/25/90	2.60	2.85	2.63	2.68	0.25	2.39	2.35	0.92	2.14
07/02/90	2.88	2.77	2.78	2.95	2.45	2.69	2.24	0.55	2.15
07/09/90	2.54	2.64	2.31	2.48	2.26	2.41	1.74	0.54	2.01
07/16/90	2.55	2.45	2.37	2.27	2.11	2.30	2.10	0.77	2.14
07/23/90	2.37	2.45	2.36	2.36	1.97	2.19	1.83	0.67	1.86
07/30/90	3.51	3.36	3.46	3.77	3.15	3.42	2.76	0.89	3.07
08/06/90	3.28	3.70	3.56	3.52	3.21	3.19	2.72	0.80	2.45
08/13/90	4.10	4.02	4.19	4.16	4.00	3.79	3.60	1.05	3.27
08/20/90	4.39	4.20	3.85	4.00	3.54	4.25	3.30	1.17	3.54
08/27/90	3.27	3.37	3.29	3.26	2.97	3.13	3.11	0.73	2.71
09/04/90	2.97	3.04	3.20	2.98	2.54	2.38	2.45	0.81	2.41
09/10/90	3.94	3.90	3.91	2.28	3.50	3.23	2.86	0.89	3.18
09/17/90	2.18	2.26	2.37	2.33	1.98	1.80	1.79	0.98	1.70
09/24/90	2.92	2.95	3.00	2.25	2.66	2.02	2.04	0.88	2.49
10/01/90	3.63	3.26	3.34	3.15	3.37	2.49	2.64	0.53	3.01
10/08/90	2.88	2.56	2.46	2.71	2.42	2.14	1.90	0.35	2.20
10/15/90	2.60	2.41	1.69	2.20	1.97	1.71	1.61	0.36	2.02
10/22/90	2.94	2.83	3.21	2.66	2.73	2.34	2.32	0.46	2.49
10/29/90	3.62	3.78	3.13	3.70	3.39	3.04	2.94	0.59	3.61
11/05/90	3.46	3.52	2.87	3.28	3.24	2.74	2.58	0.77	2.88
11/12/90	2.56	2.66	1.56	2.77	2.45	2.01	2.78	2.73	2.64
11/19/90	4.76	3.95	1.92	5.12	3.39	3.20	3.85	3.90	4.49
11/27/90	3.11	2.91	0.90	*	2.42	2.29	2.68	2.82	2.81
12/03/90	2.78	2.54	2.86	*	2.48	2.30	2.89	2.89	2.82
12/10/90	2.82	2.84	2.94	*	2.43	2.10	2.72	2.05	2.64
12/17/90	2.12	1.86	2.19	*	1.60	1.41	1.77	1.85	1.88
12/26/90	2.53	2.18	2.54	2.75	2.19	2.06	2.36	2.47	2.52
01/02/91	3.23	3.09	3.03	3.34	3.21	2.77	3.07	3.26	3.58

NOTE: Activities shown are values actually measured; * denotes that samples not available at location AKS due to prolonged power outage.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Air Particulate Filter Beryllium-7 Activity (E-2 pCi/m^3) by Location - 1990

WEEK ENDING	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	AA1	AB1	AP1	AKS	AP1	AQS2	ALC	AHS	AGS
01/08/90							7.04		
01/15/90	18.90	12.90	13.10	16.50	11.30	11.70	11.00	12.90	10.20
01/22/90	9.10		11.00	12.60	7.51	9.11	11.20	14.40	7.75
01/29/90		16.80	9.23		11.20	8.50	8.26	11.20	11.30
02/05/90	9.66	13.50	7.95		11.10	12.50	13.90	13.10	8.29
02/12/90	12.30	13.50	11.60	11.30	8.40	13.90	15.20	9.29	12.50
02/20/90	5.76	14.40	11.50	15.50	9.70	8.50	14.40	12.30	12.70
02/26/90	14.10		9.76		10.40	7.62	10.10	11.10	6.56
03/05/90	12.80	12.30	21.30		11.90	22.10	9.51	12.40	13.90
03/12/90	14.30	10.50	15.00	17.20	17.10	11.80	6.64	11.20	13.00
03/19/90	10.80	13.60	17.90	21.00	15.90	16.70	13.90	18.60	11.60
03/26/90	10.50	16.00	24.90	21.00	19.10	18.20	22.20	19.20	15.70
04/02/90	10.60	8.89	13.70	13.20	13.10	10.00	10.20	8.02	11.70
04/09/90	19.30	21.50	11.60	10.80	8.92	13.60	11.10	14.70	14.70
04/16/90	13.90	13.70	12.20	15.30	14.40	13.90	6.00	16.90	8.03
04/23/90	14.10	9.64	13.20	11.10	9.81	7.08	13.00	7.58	9.71
04/30/90	12.80	20.10	16.10	17.40	19.10	10.00	13.50	15.50	17.80
05/07/90	11.50	9.90	10.30	12.10	8.41	5.68	6.64	7.92	
05/14/90	10.70	9.09	10.60	12.10	11.30	5.90	13.50	17.00	16.90
05/21/90	12.90	16.20	16.30	13.20	10.90	5.85	16.60	9.72	15.30
05/29/90	10.20	8.71	9.28	9.79	7.02	7.33	6.17	10.60	8.42
06/04/90	11.20	12.80	9.40	20.00	11.70	10.60	9.59	8.97	10.90
06/11/90	13.00	11.60	12.20	11.10	5.66	11.60	6.50		9.63
06/18/90	13.06	10.10	14.70	11.10	8.17	10.90		10.40	10.10
06/25/90	13.80	18.30	16.00	6.92	5.97	11.00	10.50		7.67
07/02/90	11.50	12.60	9.90	1.20	14.00	11.00	10.30		8.52
07/09/90	10.20	15.10	11.10	12.70	9.48	17.10	10.60		10.40
07/16/90	12.80	10.80	12.30	10.90	11.30	13.10	8.48		
07/23/90	9.12	10.20	11.70	10.50		7.37	9.49		10.90
07/30/90		12.50	14.50	14.30	8.51	9.36	7.28		10.10
08/06/90	11.50	12.30	10.30	9.65	12.70	14.90	12.70		7.12
08/13/90	16.70	11.90	20.50	19.70	11.50	18.20	14.80		16.10
08/20/90	15.50	10.50	18.70	15.10	14.80	12.10	1.70		8.50
08/27/90	9.76		8.35	8.34	8.55	7.54	11.90		7.14
09/04/90	16.90	7.65	14.00	9.39	9.74	7.15	5.89		6.42
09/10/90	17.20	10.00	11.80	8.76	9.32	12.40	14.60		14.00
09/17/90	10.20		9.81	6.38	6.44	5.79		6.63	
09/24/90	11.30	14.80		9.03	6.09	7.53	5.67		9.21
10/01/90	8.84	12.70	14.40	15.70	13.20	7.93	13.20		10.30
10/08/90	18.30	12.70	10.40	12.10	10.20	11.80	9.71		
10/15/90	14.20		7.71	10.50	9.06	6.73			7.96
10/22/90	9.99	16.80	13.90	18.50	11.40	9.65	10.40		10.70
10/29/90	8.63	11.70	10.90		7.00	5.42			10.00
11/05/90	16.70	11.60	14.50	21.20	16.30	17.70	10.70		11.50
11/12/90	10.00	8.53		9.07	8.69	6.39	9.72	13.00	9.26
11/19/90	8.01	9.78		15.70	8.68	12.40	14.10	15.40	12.90
11/27/90	16.60	12.80		*	14.10	11.80	14.10	11.80	13.40
12/03/90	15.20	12.50		*	13.00	10.20		11.80	17.40
12/10/90	11.40	13.70	8.33	*	8.08	9.50	10.90	6.83	9.54
12/17/90	11.60	12.30	10.20	*	8.05	11.40	11.90	11.10	8.03
12/26/90	14.90	11.50	8.94	10.30	10.70	7.36	7.47	9.95	9.44
01/02/91		11.60		6.87	9.64	6.36	10.90	9.65	10.90

NOTE: Activities shown are values actually measured; * denotes that samples not available at location AKS due to prolonged power outage.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Air Particulate Filter Cesium-134 Activity (E-2 pCi/m^3) by Location - 1990

WEEK	INDICATOR LOCATION						CONTROL LOCATION		
ENDING	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AQS
01/08/90	<2.59	<1.93	<1.80	<2.52	<1.67	<1.66	<1.61	<1.70	<1.68
01/05/90	<2.36	<1.69	<1.47	<1.89	<1.34	<1.44	<1.37	<1.85	<1.34
01/22/90	<1.77	<1.65	<1.39	<1.98	<1.45	<1.31	<1.25	<1.48	<1.39
01/29/90	<1.52	<1.67	<1.54	<1.78	<1.32	<1.61	<1.32	<1.46	<1.50
02/05/90	<1.85	<1.73	<1.77	<1.84	<1.53	<1.66	<1.07	<1.44	<1.28
02/12/90	<1.44	<1.65	<1.39	<2.07	<1.35	<1.33	<1.33	<1.54	<1.32
02/20/90	<1.48	<1.47	<1.47	<1.77	<1.36	<1.29	<1.29	<1.30	<1.43
02/26/90	<2.19	<1.78	<1.46	<2.34	<1.50	<1.77	<1.58	<1.72	<1.79
03/05/90	<1.73	<1.67	<1.74	<1.99	<1.44	<1.55	<1.38	<1.34	<1.38
03/12/90	<1.81	<1.54	<1.47	<1.42	<1.31	<0.98	<1.47	<1.52	<1.60
03/19/90	<1.73	<1.65	<1.43	<1.68	<1.40	<1.38	<1.33	<1.38	<1.48
03/26/90	<1.67	<1.40	<1.80	<1.97	<1.31	<1.66	<1.42	<1.29	<1.42
04/02/90	<1.63	<1.52	<1.40	<1.43	<1.24	<1.12	<1.23	<1.39	<1.35
04/09/90	<1.53	<1.70	<1.39	<1.46	<1.21	<1.33	<1.22	<1.38	<1.33
04/16/90	<1.21	<1.58	<1.56	<1.59	<1.34	<1.20	<1.12	<1.28	<1.16
04/23/90	<1.45	<1.59	<1.66	<1.57	<1.46	<1.41	<1.34	<1.12	<1.41
04/30/90	<1.43	<1.57	<1.48	<1.63	<1.29	<1.43	<1.28	<1.21	<1.47
05/07/90	<1.57	<1.46	<1.38	<1.67	<1.19	<1.28	<1.13	<1.36	<1.48
05/14/90	<1.52	<1.45	<1.52	<1.17	<1.29	<1.27	<1.08	<1.61	<1.37
05/21/90	<1.46	<1.49	<1.53	<1.41	<1.34	<1.47	<1.32	<1.51	<1.51
05/29/90	<1.28	<1.59	<1.25	<1.54	<1.23	<1.47	<1.21	<1.21	<1.26
06/04/90	<1.95	<2.04	<2.08	<2.05	<1.61	<1.45	<1.50	<1.59	<1.43
06/11/90	<1.65	<1.85	<1.53	<1.65	<1.39	<1.39	<1.25	<1.16	<1.39
06/18/90	<1.41	<1.49	<2.04	<1.62	<1.46	<1.31	<1.20	<1.15	<1.24
06/25/90	<1.75	<1.93	<1.53	<1.62	<1.39	<1.24	<1.67	<1.23	<1.26
07/02/90	<1.59	<1.53	<1.48	<1.59	<1.34	<1.33	<1.28	<1.16	<1.40
07/09/90	<1.62	<1.88	<1.57	<1.81	<1.36	<1.64	<1.31	<1.27	<1.66
07/16/90	<1.65	<1.51	<1.54	<1.55	<1.49	<1.32	<1.64	<1.27	<1.49
07/23/90	<1.64	<1.72	<1.78	<1.69	<1.34	<1.27	<1.53	<1.46	<1.48
07/30/90	<1.88	<1.88	<1.44	<1.82	<1.42	<1.46	<1.88	<1.49	<1.63
08/06/90	<1.71	<2.12	<1.61	<1.71	<1.41	<1.43	<1.36	<1.40	<1.18
08/13/90	<1.91	<1.55	<1.26	<1.56	<1.43	<1.44	<1.53	<1.30	<1.35
08/20/90	<1.79	<1.52	<1.40	<1.71	<1.30	<1.48	<1.43	<1.30	<1.27
08/27/90	<1.54	<1.77	<1.34	<1.54	<1.28	<1.41	<1.54	<1.14	<1.16
09/04/90	<1.56	<1.43	<1.36	<1.44	<1.15	<1.28	<1.30	<1.11	<1.09
09/10/90	<2.02	<2.04	<1.61	<1.89	<1.51	<1.62	<1.53	<1.42	<1.63
09/17/90	<1.65	<1.63	<1.32	<1.43	<1.28	<1.26	<1.44	<1.32	<1.36
09/24/90	<1.46	<1.49	<1.55	<1.33	<1.27	<1.54	<1.55	<1.32	<1.02
10/01/90	<1.67	<1.75	<1.38	<1.48	<1.28	<1.29	<1.20	<1.22	<1.19
10/08/90	<1.66	<1.44	<1.22	<1.48	<1.09	<1.21	<1.15	<1.21	<1.28
10/15/90	<1.52	<1.61	<1.56	<1.41	<1.45	<1.40	<1.42	<1.28	<1.31
10/22/90	<0.94	<1.74	<1.47	<1.72	<1.10	<1.60	<1.74	<1.46	<1.05
10/29/90	<1.22	<1.57	<1.54	<1.43	<1.22	<1.37	<1.46	<1.31	<0.98
11/05/90	<0.85	<1.44	<1.51	<1.39	<1.31	<1.67	<1.48	<1.48	<0.96
11/12/90	<1.61	<1.55	<1.60	<1.42	<1.32	<1.48	<1.59	<1.55	<1.37
11/19/90	<1.81	<1.85	<1.55	<3.30	<1.45	<1.56	<1.59	<1.66	<1.47
11/27/90	<1.47	<1.24	<1.12	*	<1.38	<1.11	<1.11	<1.16	<0.96
12/03/90	<1.89	<2.14	<1.89	*	<1.60	<1.78	<2.70	<2.50	<2.55
12/10/90	<1.56	<1.71	<1.46	*	<1.67	<1.41	<1.69	<1.30	<1.55
12/17/90	<1.55	<1.92	<1.59	*	<1.46	<1.49	<1.88	<1.75	<1.49
12/26/90	<1.71	<1.24	<1.79	<1.59	<0.95	<1.22	<1.20	<1.44	<1.25
01/02/91	<1.83	<1.59	<1.77	<1.68	<1.56	<1.49	<1.48	<1.66	<1.74

NOTE: Activities indicated are minimum detectable activities (MDAs) under the particular conditions of analyses (i.e., Cs-134 may or may not have been present, but if so, there cannot have been more than the amounts shown), or they are values actually measured; * denotes that samples were not available at location AKS due to prolonged power outage.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Air Particulate Filter Cesium-137 Activity (E-2 pCi/m^3) by Location - 1990

WEEK ENDING	INDICATOR LOCATION						CONTROL LOCATION		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AQS
01/08/90	<2.23	<1.89	<2.02	<2.42	<1.51	<1.56	<1.60	<1.73	<1.65
01/05/90	<2.05	<1.50	<1.54	<2.11	<1.25	<1.38	<1.35	<1.53	<1.53
01/22/90	<1.56	<1.65	<1.54	<2.24	<1.13	<1.52	<1.17	<1.69	<1.30
01/29/90	<1.70	<1.59	<1.58	<1.85	<1.20	<1.62	<1.32	<1.27	<1.50
02/05/90	<1.76	<1.65	<1.96	<1.75	<1.60	<1.56	<1.27	<1.46	<1.51
02/12/90	<1.75	<1.62	<1.61	<2.33	<1.30	<1.64	<1.65	<1.56	<1.54
02/20/90	<1.62	<1.44	<1.55	<1.76	<1.22	<1.22	<1.27	<1.45	<1.55
02/26/90	<2.30	<1.62	<1.82	<2.71	<1.90	<1.92	<1.78	<1.85	<1.60
03/05/90	<2.20	<1.66	<1.37	<2.08	<1.53	<1.85	<1.62	<1.38	<1.68
03/12/90	<2.04	<1.86	<1.50	<2.01	<1.56	<1.49	<1.41	<1.43	<1.51
03/19/90	<1.57	<1.95	<1.67	<1.96	<1.61	<1.81	<1.40	<1.46	<1.72
03/26/90	<1.57	<1.91	<1.20	<1.08	<1.67	<1.77	<1.57	<1.66	<1.59
04/02/90	<1.60	<1.86	<1.59	<1.72	<1.15	<1.61	<1.26	<1.55	<1.35
04/09/90	<1.85	<1.53	<1.21	<1.94	<1.29	<1.42	<1.49	<1.44	<1.41
04/16/90	<1.68	<1.67	<1.54	<1.80	<1.33	<1.48	<1.10	<1.49	<1.47
04/23/90	<1.61	<1.58	<1.64	<1.59	<1.55	<1.29	<1.51	<1.38	<1.48
04/30/90	<1.72	<1.91	<1.51	<1.82	<1.46	<1.31	<1.40	<1.45	<1.85
05/07/90	<1.59	<2.13	<1.40	<1.61	<1.36	<1.57	<1.21	<1.74	<1.79
05/14/90	<1.73	<1.57	<1.64	<1.36	<1.60	<1.32	<1.08	<1.57	<1.52
05/21/90	<1.63	<1.77	<1.48	<2.17	<1.41	<1.36	<1.19	<1.52	<1.72
05/29/90	<1.46	<1.55	<1.19	<1.36	<1.15	<1.36	<1.17	<1.29	<1.49
06/04/90	<2.06	<2.56	<2.23	<1.97	<2.02	<1.54	<1.93	<1.64	<1.79
06/11/90	<1.91	<1.89	<1.61	<2.00	<1.69	<1.57	<1.43	<1.49	<1.36
06/18/90	<1.53	<1.83	<2.05	<1.68	<1.45	<1.41	<1.39	<1.38	<1.60
06/25/90	<2.06	<2.15	<1.87	<2.01	<1.24	<1.58	<1.85	<1.21	<1.40
07/02/90	<1.69	<1.46	<1.83	<1.47	<1.28	<1.50	<1.39	<1.35	<1.39
07/09/90	<1.81	<1.64	<1.74	<1.85	<1.38	<1.54	<1.60	<1.17	<1.68
07/16/90	<1.88	<1.50	<1.63	<1.58	<1.47	<1.61	<1.85	<1.32	<1.85
07/23/90	<1.98	<1.61	<1.39	<1.68	<1.64	<1.75	<1.52	<1.36	<1.63
07/30/90	<1.81	<2.20	<1.92	<1.66	<1.42	<1.58	<1.59	<1.55	<1.75
08/06/90	<1.84	<1.90	<1.71	<1.65	<1.30	<1.72	<1.77	<1.36	<1.24
08/13/90	<2.01	<1.85	<1.68	<1.81	<1.45	<1.55	<1.66	<1.45	<1.40
08/20/90	<1.78	<1.77	<1.44	<1.40	<1.73	<1.31	<1.92	<1.52	<1.24
08/27/90	<1.76	<1.99	<1.62	<1.63	<1.44	<1.21	<1.67	<1.12	<1.12
09/04/90	<1.71	<1.66	<1.39	<1.29	<1.21	<1.51	<1.58	<1.06	<1.09
09/10/90	<1.87	<2.30	<1.58	<1.83	<1.63	<1.88	<1.72	<1.47	<1.33
09/17/90	<1.84	<1.74	<1.43	<1.83	<1.27	<1.43	<1.39	<1.35	<1.31
09/24/90	<1.51	<1.62	<1.29	<1.74	<1.13	<1.34	<1.22	<1.41	<1.37
10/01/90	<2.13	<1.78	<1.45	<1.89	<1.26	<1.49	<1.58	<1.25	<1.42
10/08/90	<1.89	<1.75	<1.58	<1.58	<1.23	<1.65	<1.49	<1.30	<1.33
10/15/90	<1.85	<1.71	<1.94	<1.75	<1.69	<1.59	<1.78	<1.22	<1.60
10/22/90	<1.10	<1.68	<1.68	<1.78	<1.47	<1.93	<2.00	<1.52	<1.24
10/29/90	<1.24	<1.62	<1.62	<1.38	<1.43	<1.34	<1.41	<1.60	<1.51
11/05/90	<1.15	<2.28	<1.65	<2.11	<1.29	<1.67	<1.90	<1.54	<1.12
11/12/90	<1.91	<1.78	<1.70	<1.32	<1.34	<1.54	<1.65	<1.66	<1.21
11/19/90	<1.78	<1.93	<1.44	<3.45	<1.65	<1.88	<1.35	<1.82	<1.49
11/27/90	<1.26	<1.24	<1.26	*	<1.41	<1.29	<1.10	<1.08	<0.94
12/03/90	<1.88	<1.98	<1.69	*	<1.79	<1.73	<2.90	<2.73	<2.57
12/10/90	<1.49	<1.81	<1.29	*	<1.40	<1.37	<1.92	<1.39	<1.59
12/17/90	<1.71	<1.79	<1.54	*	<1.89	<1.48	<1.61	<1.78	<1.47
12/26/90	<1.71	<1.20	<1.66	<1.82	<1.01	<1.22	<1.30	<1.45	<1.11
01/02/91	<1.93	<1.75	<1.71	<1.77	<1.42	<1.56	<1.48	<1.69	<1.53

NOTE: Activities indicated are minimum detectible activities (MDAs) under the particular conditions of analyses (i.e., Cs-137 may or may not have been present, but if so, there cannot have been more than the amounts shown), or they are values actually measured; * denotes that samples were not available at location AKS due to prolonged power outage.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Charcoal Cartridge Potassium-40 Activity (E-2 pCi/m^3) by Location - 1990

WEEK ENDING	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/08/90	66.20	66.80	62.60	82.60	41.20	56.40	53.40	59.70	56.50
01/15/90	89.70	57.70	59.00	82.10	44.50	41.60	61.20	49.30	61.80
01/22/90	59.60	66.50	47.30	63.20	50.00	54.60	52.80	58.10	45.80
01/29/90	41.50	58.80	56.40	65.10	57.90	45.30	36.70	38.70	52.60
02/05/90	73.30	81.10	51.70	56.50	49.30	40.90	39.90	52.00	54.70
02/12/90	64.40	56.40	68.90	39.90	43.50	50.70	77.80	38.80	34.80
02/20/90	60.30	50.50	48.60	60.10	53.10	37.20	50.70	35.50	43.40
02/26/90	52.30	67.80	52.90	227.00	32.70	58.30	48.70	49.50	70.50
03/05/90	58.00	37.80	23.30	42.20	61.10	39.10	58.10	47.90	39.40
03/12/90	62.00		51.00	49.30	49.50	40.40	42.50	36.30	49.40
03/19/90	69.40	67.30	38.30	31.00	37.90	66.20	53.10	75.50	46.00
03/26/90	57.30	54.00	58.90	75.70	67.10		38.40	43.10	54.00
04/02/90	43.10	66.30	43.30	52.10	56.00	58.20	54.40	54.80	47.50
04/09/90	63.10	55.80	60.30	41.20	23.80	33.70	46.90	38.20	45.40
04/16/90	69.30	77.00	55.80	50.50	39.50	45.20	35.20	65.50	47.60
04/23/90	65.00	55.80	52.20	47.10	45.20	53.10	42.00	36.10	59.50
04/30/90	62.80	53.40	58.70	40.80	37.60	51.50	39.90	50.50	48.10
05/07/90	58.70	72.90	68.10	67.40	72.60	57.40	57.50	62.10	70.00
05/14/90	87.30	54.40	83.60	59.80	66.60	79.00	54.10	52.80	70.60
05/21/90	63.80	60.50	51.10	70.00	70.10	58.10	61.30	54.50	65.00
05/29/90	62.50	44.80	56.70	66.60	56.50	50.40	68.30	63.10	54.40
06/04/90	102.00	92.20	73.90	89.20	89.20	78.30	65.90	85.80	79.80
06/11/90	74.80	62.70	80.20	97.30	66.30	69.90	70.10	45.80	59.70
06/18/90	70.20	73.50	76.00	82.60	53.00	52.10	72.40	49.90	64.70
06/25/90	54.90	70.30	82.30	66.00	60.00	88.50	57.70	51.40	59.90
07/02/90	66.90	84.70	98.90	74.90	39.50	62.20	58.00	44.30	81.00
07/09/90	69.50	97.40	73.00	71.60	66.10	77.10	81.90	51.90	51.90
07/16/90	83.20		64.60	76.30	55.70	60.80	67.10	54.40	64.90
07/23/90	80.60	69.40	62.60	72.50	53.00	39.00	50.80		59.20
07/30/90	73.20	60.00	69.00	89.80	55.60	66.10	85.40	58.80	57.00
08/06/90	83.40	66.50	67.20	73.70	58.40	43.80	68.60	46.70	56.40
08/13/90	93.30		57.10	83.30		46.60	52.30	57.40	67.50
08/20/90	73.50	53.10	60.50	62.00	63.40	60.30	73.00	55.90	47.30
08/27/90	78.10	70.60	73.50	63.00	85.30	49.50	65.40	55.20	47.50
09/04/90	59.80	63.40	40.40	39.90	50.60	41.60	46.50	30.20	74.20
09/10/90	72.90	85.60	70.60	92.40	67.70	84.60	49.80	72.10	62.50
09/17/90	84.40	65.10	72.60	64.80	53.50	48.10	54.80	57.10	62.90
09/24/90	65.60	73.30	67.20	99.20	46.90	61.70	53.10	44.80	59.10
10/01/90	55.00	63.20	44.80	56.40	83.00	56.50	69.50	61.00	31.50
10/08/90	41.50	74.90	59.30	40.80	35.30	40.60	42.80	43.50	38.00
10/15/90	32.50		41.10	28.90	29.90	40.90	36.50	59.20	21.20
10/22/90	26.00		27.90	39.60	48.10	35.20	51.90	35.30	36.00
10/29/90	41.20	44.70	47.20	37.10	48.00	42.50	23.60	43.90	24.60
11/05/90	32.20	55.90	57.80	25.30	46.80	43.90	47.40	36.80	59.80
11/12/90	46.10	49.70	44.90	41.50	29.20	38.20	44.80	32.70	42.50
11/19/90	45.90	23.60	60.30	79.30	40.00	40.60	49.80	48.30	
11/27/90	31.00	43.90	49.40	*	36.70	23.90		40.20	66.80
12/03/90	47.40	46.40	44.60	*	32.70	59.70	60.00	76.20	33.40
12/10/90	38.10	36.90	41.80	*	47.60	57.00	51.70	43.70	29.00
12/17/90	49.70	81.70	65.60	*	50.40	43.20	28.10	53.30	38.20
12/26/90	43.70	44.80	32.10	48.40	29.20	30.30	36.50	33.30	50.40
01/02/91	24.70	50.00	33.50	50.40	40.50	42.10	44.80	45.50	50.40

NOTE: Activities shown are values actually measured; * denotes that samples were not available at location AKS due to prolonged power outage.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Charcoal Cartridge Iodine-131 Activity (E-2 pCi/m^3) - 1990

WEEK ENDING	INDICATOR LOCATION						CONTROL LOCATION		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/08/90	<2.99	<2.09	<2.04	<2.55	<1.83	<1.96	<1.88	<2.04	<2.12
01/15/90	<2.24	<1.82	<1.87	<1.96	<1.44	<1.52	<1.33	<2.22	<1.94
01/22/90	<1.86	<1.79	<1.82	<2.32	<1.85	<1.49	<1.71	<1.44	<1.82
01/29/90	<1.96	<1.42	<1.78	<1.99	<1.34	<1.75	<1.38	<1.62	<1.89
02/05/90	<1.81	<1.62	<2.00	<1.75	<1.58	<1.35	<1.25	<1.69	<1.47
02/12/90	<1.56	<1.61	<1.92	<2.05	<1.51	<1.65	<1.94	<1.62	<1.70
02/20/90	<1.79	<1.70	<1.48	<2.19	<1.31	<1.88	<1.44	<1.51	<1.77
02/26/90	<2.23	<2.25	<2.15	<2.88	<1.94	<2.17	<1.69	<2.05	<2.14
03/05/90	<1.84	<1.84	<1.76	<1.84	<1.65	<1.32	<1.61	<1.76	<1.83
03/12/90	<1.62	<1.53	<1.69	<1.97	<1.66	<1.69	<1.60	<1.48	<1.58
03/19/90	<1.96	<1.76	<1.83	<1.97	<1.46	<1.74	<1.52	<1.80	<1.70
03/26/90	<1.80	<1.87	<1.87	<1.87	<1.73	<1.64	<1.50	<1.85	<1.83
04/02/90	<1.87	<1.43	<1.62	<1.82	<1.38	<1.54	<1.76	<1.69	<1.74
04/09/90	<1.66	<1.61	<1.82	<1.66	<1.73	<1.57	<1.89	<1.55	<2.16
04/16/90	<1.85	<1.64	<1.66	<1.64	<1.40	<1.61	<1.47	<1.42	<1.75
04/23/90	<1.98	<1.67	<1.76	<1.69	<1.65	<1.45	<1.56	<1.60	<1.71
04/30/90	<1.98	<1.42	<1.74	<1.73	<1.66	<1.44	<1.58	<1.40	<1.94
05/07/90	<1.81	<1.67	<1.98	<1.70	<1.68	<1.56	<1.48	<1.48	<2.09
05/14/90	<1.92	<2.07	<2.05	<1.88	<1.48	<1.60	<1.40	<1.44	<1.67
05/21/90	<2.05	<2.00	<1.92	<1.79	<1.47	<1.37	<1.93	<1.76	<1.60
05/29/90	<1.57	<1.66	1.61	<1.64	<1.64	<1.19	<1.59	<1.21	<1.65
06/04/90	1.61	2.41	3.09	<2.34	<2.21	<1.88	<1.97	<2.02	<2.01
06/11/90	<1.86	<2.06	<2.32	<1.99	<1.89	<1.71	<1.47	<1.50	<1.75
06/18/90	<1.72	0.96	<2.37	<1.95	<1.76	<1.74	<1.58	<1.42	<1.96
06/25/90	<2.08	<1.99	<2.30	<2.00	<1.67	<1.72	<1.83	<1.51	<1.77
07/02/90	<1.74	<1.76	<1.70	<1.93	<1.60	<1.53	<1.78	<1.74	<1.75
07/09/90	<1.91	<1.75	<2.00	<2.06	<1.70	<1.72	<1.80	<1.67	<1.97
07/16/90	<2.22	<1.78	<1.89	<2.03	<1.44	<1.60	<1.83	<1.31	<2.15
07/23/90	<1.77	<1.77	<2.04	<1.94	<1.54	<1.79	<1.64	<1.60	<1.79
07/30/90	<1.96	<1.86	<1.92	<2.03	<1.69	<1.87	<1.82	<1.69	<1.58
08/06/90	<1.69	<1.73	<1.86	<2.08	<1.71	<1.55	<1.83	<1.58	<1.59
08/13/90	<2.16	<1.97	<1.92	<2.07	<2.02	<1.61	<1.81	<1.57	<2.07
08/20/90	<2.09	<1.86	<1.64	<1.66	<1.63	<1.71	<1.91	<1.48	<1.63
08/27/90	<1.83	<1.87	<1.53	<1.98	<1.42	<1.39	<2.02	<1.05	<1.77
09/04/90	<1.64	<1.39	<1.53	<1.51	<1.18	<1.30	<1.40	<1.12	<1.10
09/10/90	<1.95	<2.24	<1.84	<1.95	<1.56	<1.77	<1.98	<1.90	<2.12
09/17/90	<1.69	<1.94	<1.83	<1.91	<1.58	<1.48	<1.50	<1.68	<1.65
09/24/90	<1.77	<1.73	<1.71	<1.65	<1.39	<1.75	<1.62	<1.51	<1.78
10/01/90	<1.48	<1.73	<1.64	<1.61	<1.40	<1.55	<1.70	<1.55	<1.59
10/08/90	<1.76	<1.65	<1.35	<1.63	<1.49	<1.68	<1.92	<1.63	<1.65
10/15/90	<1.27	<1.93	<1.56	<1.73	<1.05	<1.35	<1.53	<1.39	<1.57
10/22/90	<1.08	<1.83	<1.56	<1.64	<1.36	<1.54	<1.71	<1.63	<1.18
10/29/90	<1.24	<1.90	<1.65	<1.76	<1.44	<1.56	<1.70	<1.62	<1.17
11/05/90	<1.14	<1.85	<1.59	<1.69	<1.37	<1.69	<1.28	<1.51	<1.38
11/12/90	<1.50	<1.79	<1.71	<1.61	<1.15	<1.50	<2.06	<1.37	<1.70
11/19/90	<1.65	<1.80	<1.80	<2.90	<1.58	<1.60	<1.49	<1.75	<1.72
11/27/90	<1.58	<1.69	<1.85	*	<1.39	<1.44	<1.35	<1.20	<1.08
12/03/90	<2.33	<2.24	<2.25	*	<1.89	<1.91	<3.41	<3.10	<3.53
12/10/90	<1.76	<1.58	<1.76	*	<1.35	<1.67	<1.93	<1.75	<1.66
12/17/90	<1.58	<1.83	<1.70	*	<1.66	<1.43	<1.88	<2.02	<2.00
12/26/90	<1.29	<1.33	<1.19	<1.97	<1.13	<1.13	<1.65	<1.37	<1.24
01/02/91	<1.69	<1.59	<1.72	<1.75	<1.40	<1.42	<1.94	<1.74	<1.63

NOTE: Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis) of nuclides for which analyses are required by RBS Technical Specifications (that is, I-131 may or may not have been present, but if so, there cannot have been more present than the amounts noted); * denotes that samples were not available at location AKS due to prolonged power outage.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Charcoal Cartridge Cesium-137 Activity (E-2 pCi/m^3) by Location - 1990

WEEK ENDING	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/08/90									
01/15/90									
01/22/90									
01/29/90									
02/05/90									
02/12/90									
02/20/90									
02/26/90									
03/05/90									
03/12/90									
03/19/90									
03/26/90									
04/02/90									
04/09/90									
04/16/90									
04/23/90									
04/30/90									
05/07/90									
05/14/90									
05/21/90									
05/29/90									
06/04/90									
06/11/90									
06/18/90									
06/25/90									
07/02/90									
07/09/90									
07/16/90									
07/23/90				1.33					
07/30/90									
08/06/90									
08/13/90									
08/20/90									
08/27/90				*					
09/04/90									
09/10/90									
09/17/90									
09/24/90	1.01								
10/01/90									
10/08/90									
10/15/90									
10/22/90									
10/29/90								1.31	
11/05/90									
11/12/90									
11/19/90						0.90			
11/27/90									
12/03/90									
12/10/90									
12/17/90									
12/26/90									
01/02/91									

NOTE: Activities shown are values actually measured; * denotes that samples were not available at location AKS due to prolonged power outage.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Normalized Gamma-Ray Exposure Summary (mR)
Quarterly Thermoluminescence Dosimeter Results for 1990

INDICATOR STATION	1ST QTR	2ND QTR	3RD QTR	4TH QTR
TA1	11.24	13.42	15.97	12.56
TA2	12.55	14.41	15.39	14.13
TB1	11.78	12.73	13.76	13.44
TB2	11.71	15.10	17.37	13.93
TC1	12.08	13.32	13.91	12.95
TC2	8.55	11.11	13.23	11.68
TCS	10.21	10.75	12.22	10.41
TD1	11.82	14.51	14.00	13.15
TD2	11.68	11.94	13.61	11.78
TE1	11.65	12.04	14.90	12.37
TE2	10.55	10.85	11.83	9.53
TF1	10.67	12.83	14.50	12.76
TF2	11.55	13.52	14.50	13.74
TG1	12.29	13.03	16.68	15.50
TG2	10.81	11.84	14.10	12.88
TH1	9.53	10.45	11.83	11.00
TH2	11.01	12.14	13.20	10.37
TJ1	10.91	11.15	13.91	11.49
TJ2	9.88	11.40	13.20	10.26
TK1	10.74	12.53	13.61	11.49
TK2	12.15	13.72	14.30	13.25
TKS	10.44	11.34	12.47	10.85
TL1	10.84	13.42	14.30	12.46
TL2	9.95	10.85	11.73	10.60
TLS	11.25	14.41	13.91	13.20
TM1	9.29	10.95	11.73	10.16
TM2	13.85	13.52	15.49	15.10
TN1	11.55	13.52	14.50	12.17
TN2	9.68	10.65	12.03	10.21
TP1	12.46	14.31	15.98	12.95
TP2	10.91	13.12	15.38	12.46
TQ1	10.77	11.54	13.61	12.95
TQ2	10.01	12.01	13.42	10.60
TQS1	11.98	14.61	15.18	13.17
TQS2	10.87	11.54	12.64	10.07
TR1	7.81	9.07	9.70	9.01
TR2	10.95	12.63	13.61	15.69
TRS	11.88	13.62	14.20	14.14
CONTROL STATION				
TAC	12.58	12.81	14.50	13.85
TEC	11.48	12.53	15.49	12.69
TGS	11.21	12.83	14.50	13.37
THS	13.45	14.01	15.98	14.33
TLC	10.31	10.75	11.63	11.33
TQS3	11.51	12.01	14.79	11.72

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Normalized Gamma-Ray Exposure Summary (mR)
Monthly Thermoluminescence Dosimeter Results for 1990

INDICATOR STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TA1	3.87	3.71	3.85	3.71	3.84	4.78	4.87	4.65	4.17	5.17	5.01	4.21
TA2	4.63	4.73	4.02	3.99	3.94	4.78	4.75	5.18	5.39	5.76	5.27	4.36
TB1	4.28	4.25	4.17	3.85	3.94	4.67	4.77	5.09	4.83	5.48	4.83	4.64
TB2	4.28	4.23	4.05	4.31	4.03	5.06	4.96	5.26	4.72	5.26	4.82	3.93
TC1	4.39	4.20	4.23	3.92	3.80	4.78	4.87	4.91	5.06	5.38	4.92	4.32
TC2	3.32	3.73	3.08	3.45	3.26	3.72	4.06	4.32	4.17	4.56	3.91	3.10
TCS	3.32	3.20	3.26	3.34	3.65	3.56	4.23	3.89	3.61	3.96	3.73	3.52
TD1	4.57	3.88	3.83	3.71	4.00	5.34	4.97	5.18	4.83	5.69	5.09	4.32
TD2	3.84	3.95	3.47	3.88	3.65	4.88	4.65	4.75	4.39	6.56	5.09	3.52
TE1	4.07	3.80	3.77	3.50	3.80	4.78	4.29	4.91	5.28	4.97	4.92	4.00
TE2	4.01	3.73	3.14	3.13	3.07	4.13	4.02	4.06	3.72	4.76	3.91	3.21
TF1	3.86	3.68	3.61	3.81	3.90	4.59	4.77	4.55	4.50	5.17	4.66	4.21
TF2	4.22	3.98	4.26	4.20	3.84	4.41	5.06	4.92	5.28	5.46	5.18	4.55
TG1	4.64	4.23	3.89	4.43	3.90	4.88	5.06	5.46	4.72	5.38	4.92	4.00
TG2	4.46	4.13	3.77	3.88	3.80	4.66	4.66	5.18	4.17	5.05	4.91	3.83
TH1	3.57	3.26	3.39	3.09	3.20	3.75	4.19	4.27	3.72	4.24	4.06	3.03
TH2	3.84	3.95	3.35	3.24	3.60	4.69	4.13	4.32	3.67	4.08	4.09	3.41
TJ1	3.89	3.95	3.52	3.61	3.60	3.94	4.09	4.27	4.06	4.97	4.41	3.46
TJ2	3.60	3.72	3.33	3.24	3.07	3.56	4.02	4.09	3.89	4.44	3.63	3.03
TK1	3.96	3.88	3.52	3.40	3.60	4.68	4.97	4.56	4.61	4.97	4.41	4.21
TK2	4.31	4.28	3.65	3.99	4.06	4.98	4.58	4.09	4.39	5.15	4.21	4.23
TKS	3.77	3.85	3.24	3.81	3.55	11.17	4.03	4.09	3.89	4.44	4.15	4.00
TL1	4.21	4.99	3.67	4.12	3.50	4.13	4.67	5.00	4.61	4.76	4.83	3.46
TL2	3.48	3.39	2.83	3.03	3.20	3.48	3.71	4.00	3.72	4.08	4.25	3.84
TLS	4.65	4.09	4.00	3.99	3.89	4.66	4.67	4.46	4.72	5.15	5.28	4.62
TM1	3.96	3.78	3.11	3.30	3.00	3.56	3.61	3.91	3.83	4.35	3.98	2.39
TM2	4.54	4.91	4.40	4.10	4.06	5.41	5.35	5.55	5.17	5.63	6.03	4.55
TN1	3.93	4.16	4.11	3.61	3.60	4.69	4.19	4.27	4.17	5.69	4.83	3.89
TN2	3.65	3.46	3.00	3.03	3.11	3.80	3.90	4.18	3.83	4.37	3.59	3.72
TP1	4.68	4.13	3.90	3.71	4.20	4.97	5.06	4.83	4.50	6.00	4.75	3.46
TP2	4.28	3.74	3.67	3.35	3.84	4.39	5.16	4.41	4.83	5.06	4.74	3.57
TQ1	4.21	3.95	3.47	3.61	3.30	4.13	4.48	4.55	4.50	4.76	4.06	3.35
TQ2	4.08	3.61	3.80	3.67	3.45	4.39	4.16	4.49	4.17	4.66	4.74	3.78
TQS1	4.66	3.95	3.86	3.67	3.94	4.59	4.76	5.26	4.50	5.36	4.74	4.24
TQS2	3.98	3.98	3.47	3.19	3.37	4.66	4.36	4.23	4.06	4.76	4.21	2.90
TR1	3.52	2.89	2.92	2.78	2.78	3.52	3.51	3.68	3.28	4.14	3.81	2.59
TR2	3.63	3.88	3.65	3.35	3.45	4.50	4.44	4.75	4.50	5.36	4.91	3.37
TRS	4.22	4.02	4.20	3.88	3.94	4.78	4.54	4.58	4.50	5.46	4.73	3.67
CONTROL STATION												
TAC	4.18	3.95	4.08	3.88	3.80	4.68	4.46	4.75	4.50	4.76	4.39	3.83
TEC	4.22	3.95	5.26	3.35	3.74	4.88	4.75	4.49	4.83	5.36	4.36	3.87
TGS	4.87	4.20	4.50	3.88	4.06	4.55	4.66	4.74	4.72	5.54	5.00	4.07
THS	4.54	4.23	4.11	4.20	4.40	5.30	4.76	5.36	4.94	5.25	5.37	4.87
TLC	3.68	3.46	3.36	3.24	3.71	4.23	4.00	4.09	3.72	3.99	4.15	3.57
TQS3	4.14	4.12	3.84	3.67	3.50	4.45	4.26	4.75	4.72	5.26	4.74	4.14

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gross Beta Activities (pCi/liter) in Water Samples - 1990

SAMPLING PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS		
	SWD	DW	DL	WD	SWU	WU	BLANK[1]
JAN	8.46	6.17	35.64		10.80		<2.22
FEB	6.02	6.06	20.69		5.00		<2.14
MAR	5.95	4.83	35.34	<2.46	5.95	<2.42	3.63
APR	6.64	8.17	41.20		6.87		<2.06
MAY	13.73	11.78	67.42		13.70		4.78
JUN	12.07	12.44	49.09	5.73	11.11	6.89	4.24
JUL	17.05	13.02	49.16	4.83	14.32	5.95	3.54
AUG	10.13	14.36	34.00	5.36	11.08	5.25	4.07
SEP	10.11	11.21	38.09		9.63		4.46
OCT	11.08	10.50	49.97		13.57		4.78
NOV	9.66	10.55	34.32		9.08		4.94
DEC	3.36	4.53	29.77	3.02	5.90	<2.80	<2.22

NOTE: [1]Distilled, deionized well water (laboratory reagent water).

Samples from SWD, DW, and SWU are composites of weekly grabs; samples from DL are composites of hourly grabs; samples from WD and WU are quarterly grabs.

Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis (that is, gross beta activity may or may not have been present, but if so, there cannot have been more present than the amounts listed).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Tritium Activities (pCi/liter) in Monthly Water Samples - 1990

SAMPLING PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS		
	SWD	DW	DL	WD	SWU	WU	BLANK[1]
JAN	<175	<176	4243	<173	<176	<174	<176
FEB	<178	<178	3981	<174	<181	<173	<181
MAR	<178	<184	7900	<176	<181	<179	<180
APR	<181	<182	5597	<181	191	n.a.	<182
MAY	<198	<198	10617	<198	<198	<198	<196
JUN	<170	<170	17300	<170	<170	<170	<197
JUL	<209	<210	21008	<207	<209	<211	<210
AUG	<188	<188	28884	<190	<188	<184	<189
SEP	<191	<193	60410	<191	<193	<189	<190
OCT	<187	<187	50728	<186	<187	<186	<186
NOV	<188	<183	39626	<189	<189	<189	<188
DEC	<184	<184	3575	<184	<185	<184	<184

Tritium Activities (pCi/liter) in Quarterly Water Samples - 1990

SAMPLING PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS		
	SWD	DW	DL	WD	SWU	WU	BLANK[1]
QTR1	<180	<180	5705	<176	<188	<179	<179
QTR2	<205	<203	10294	<170	<205	<170	<207
QTR3	<192	<192	35450	<191	<194	<189	<186
QTR4	<179	<180	30360	<184	<180	<184	<177

NOTE: [1]Distilled, deionized well water (laboratory reagent water).

Samples from SWD, DW, and SWU are composites of weekly grabs; samples from DL are composites of hourly grabs; samples from WD and WU are monthly grabs (none obtained at WU in April; the license requirement for sampling is quarterly).

Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis (that is, tritium may or may not have been present, but if so, there cannot have been more present than the amounts listed).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclide Activity (pCi/liter) in Water by Location - 1990

BERYLLIUM-7

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
DEC				14.90		

POTASSIUM-40

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	15.50	15.00	28.30		11.00	
FEB			16.60			
MAR	19.10	22.10	17.50		12.10	12.50
APR	15.00	12.00	31.30		18.90	
MAY	13.20		24.10		15.20	
JUN	18.10	13.80	27.00	9.27	20.00	18.40
JUL	15.00	18.40	33.30		17.50	
AUG	14.70	10.30	36.40	1.70	17.90	18.00
SEP	12.80	19.10	30.80		18.20	
OCT			26.00			
NOV	19.20	17.50	23.10		19.90	
DEC	13.90	13.30	33.00		12.00	13.30

CHROMIUM-51

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN			23.20			
FEB			24.00			
MAR			70.00			
APR			13.10			
MAY			60.40			
JUN			44.80			
JUL			63.10			
AUG			62.70			
SEP			185.00			
OCT			195.48			
NOV			12.10			
DEC						

NOTE: Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities under the particular conditions of analysis of nuclides for which analyses are required by RBS Technical Specifications (that is, the nuclides may or may not have been present, but if so, there cannot have been more present than the amounts listed)

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclide Activity (pCi/liter) in Water by Location -1990

MANGANESE-54

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<1.81	<1.78	6.60		<1.71	
FEB	<2.28	<2.43	4.25		<2.12	
MAR	<1.73	<1.81	13.30	<2.34	<1.74	<2.17
APR	<1.80	<1.63	9.84		<1.56	
MAY	<1.62	<1.69	24.80		<1.82	
JUN	<1.78	<1.72	3.02	<1.65	<1.74	<1.76
JUL	<1.66	<1.59	4.43		<1.71	
AUG	<1.60	<1.78	2.92	<1.61	<1.71	<1.76
SEP	<1.75	<1.64	7.91		<1.61	
OCT	<2.40	<1.72	11.61		<0.82	
NOV	<1.72	<1.79	6.75		<1.81	
DEC	<1.71	<0.95	1.19	<1.84	<0.91	<1.86

COBALT-58

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<1.98	<2.03	1.01		<1.96	
FEB	<2.37	<2.34	1.74		<2.44	
MAR	<1.65	<1.85	10.70	<2.12	<1.95	<2.13
APR	<1.84	<1.70	5.53		<1.72	
MAY	<1.83	<1.72	9.87		<1.98	
JUN	<1.95	<1.91	1.52	<1.52	<1.89	<1.79
JUL	<1.88	<1.98	1.95		<2.16	
AUG	<1.75	<1.96	0.97	<1.98	<1.95	<2.08
SEP	<1.83	<2.06	1.57		<2.02	
OCT	<2.65	<1.93	3.86		<0.96	
NOV	<1.94	<1.97	1.73		<2.18	
DEC	<2.15	<1.22	<1.98	<2.02	<1.20	<1.96

IRON-59

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<3.91	<3.97	<5.01		<4.07	
FEB	<5.63	<5.88	<7.28		<6.10	
MAR	<4.22	<4.43	7.85	<3.93	<4.46	<4.12
APR	<4.14	<4.30	4.52		<3.89	
MAY	<4.29	<4.77	8.44		<5.18	
JUN	<4.23	<4.02	<4.56	<3.43	<4.41	<3.55
JUL	<4.76	<5.04	<5.42		<4.68	
AUG	<4.22	<4.60	2.51	<3.91	<4.69	<4.80
SEP	<4.08	<4.78	3.08		<4.45	
OCT	<6.62	<4.47	1.77		<1.98	
NOV	<4.68	<4.40	<5.43		<4.67	
DEC	<4.28	<3.35	<4.54	<4.81	<3.17	<5.14

NOTE: Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis of nuclides for which analyses are required by RBS Technical Specifications (that is, the nuclides may or may not have been present, but if so, there cannot have been more present than the amounts listed).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclide Activity (pCi/liter) in Water by Location -1990

COBALT-60

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<1.89	<1.94	19.57		<2.00	
FEB	<2.61	<2.48	13.30		<2.62	
MAR	<1.90	<1.94	12.03	<2.57	<2.05	<2.84
APR	<1.98	1.60	18.50		<1.76	
MAY	<1.82	<1.71	55.50		<1.91	
JUN	<1.93	<1.93	6.14	<1.76	<2.04	<1.84
JUL	<1.83	<1.83	9.01		<1.81	
AUG	<1.76	<1.76	10.20		<1.97	
SEP	<1.76	<1.99	11.90	<1.87	<1.89	<2.49
OCT	<2.70	<1.64	31.60		<0.88	
NOV	<2.04	<1.77	19.20		<1.94	
DEC	<1.76	<0.99	2.85	<1.71	<0.91	<1.83

ZINC-65

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<4.12	<4.09	<4.31		<4.13	
FEB	<5.53	<5.24	<5.22		<4.85	
MAR	<3.78	<4.09	<7.90	<4.99	<3.94	<5.23
	<3.84	<3.63	<4.43		<3.53	
	<3.63	<3.63	<5.98		<3.81	
	<3.74	<3.55	<4.09	<3.57	<3.67	<3.62
	<3.21	<3.83	<4.01		<4.40	
AUG	<3.40	<3.95	<4.33		<3.96	
SEP	<3.48	<4.08	<4.55	<3.52	<3.74	<4.15
OCT	<5.46	<3.47	<5.42		<2.03	
NOV	<4.17	<3.83	<4.69		<3.95	
DEC	<3.75	<2.16	<3.62	<3.86	<1.92	<3.96

NIOBIUM-95

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<2.31	<2.39	<2.43		<2.31	
FEB	<3.39	<3.57	<3.46		<3.49	
MAR	<2.27	<2.39	<3.52	<2.51	<2.59	<2.15
APR	<2.08	<2.23	<2.13		<2.04	
MAY	<2.31	<2.54	<3.52		<2.81	
JUN	<2.22	<2.28	<2.29	<1.75	<2.39	<1.91
JUL	<2.51	<2.70	<2.77		<2.62	
AUG	<2.15	<2.49	<2.85	<2.49	<2.22	<2.47
SEP	<2.15	<2.54	2.56		<2.44	
OCT	<3.27	<2.51	4.16		<1.12	
NOV	<2.81	<2.68	<3.02		<2.57	
DEC	<2.59	<2.09	<2.49	<3.10	<1.91	<2.77

NOTE: Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis of nuclides for which analyses are required by RBS Technical Specifications (that is, the nuclides may or may not have been present, but if so, there cannot have been more present than the amounts listed).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclide Activity (pCi/liter) in Water by Location -1990

ZIRCONIUM-95

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<3.37	<3.74	<3.66		<3.55	
FEB	<4.52	<4.38	<5.05		<4.67	
MAR	<3.36	<3.30	<5.45	<3.37	<3.76	<3.44
APR	<3.18	<3.25	<3.47		<2.90	
MAY	<3.38	<3.51	<4.99		<3.66	
JUN	<3.60	<3.06	<3.28	<2.95	<3.62	<3.18
JUL	<3.61	<3.54	<3.63		<3.79	
AUG	<2.97	<3.68	<3.83	<3.47	<3.44	<3.61
SEP	<3.04	<3.56	<4.12		<3.39	
OCT	<4.77	<3.53	1.03		<4.38	
NOV	<3.87	<3.73	<4.38		<3.69	
DEC	<3.45	<2.41	<3.45	<3.94	<2.25	<3.61

IODINE-131

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<2.17	<4.14	<2.31		<2.36	
FEB	<3.97	<4.81	<3.50		<4.42	
MAR	<1.84	<3.11	<1.74	<0.75	<2.05	<0.77
APR	<1.54	<2.66	<1.38		<1.66	
MAY	<11.10	<7.74	<7.19		<8.28	
JUN	<2.03	<2.26	<2.04	<0.69	<2.08	<0.68
JUL	<4.75	<5.69	<4.78		<5.11	
AUG	<2.40	<6.15	<3.46	<10.90	<1.97	<11.70
SEP	<2.50	<2.50	<2.62		<3.01	
OCT	<3.94	<5.10	<6.89		<3.88	
NOV	<3.72	<4.08	<3.63		<4.06	
DEC	<4.70	<13.60	<4.54	<6.17	<14.20	<6.40

CESIUM-134

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<1.73	<1.54	<1.70		<1.79	
FEB	<2.25	<2.07	<2.40		<2.13	
MAR	<1.65	<1.56	<3.03	<2.08	<1.64	<2.20
APR	<1.68	<1.57	<1.81		<1.56	
MAY	<1.56	<1.54	<2.34		<1.58	
JUN	<1.62	<1.59	<1.64	<1.58	<1.60	<1.69
JUL	<1.66	<1.67	<1.66		<1.72	
AUG	<1.53	<1.80	<1.86	<1.65	<1.59	<1.64
SEP	<1.49	<1.70	<1.95		<1.63	
OCT	<2.05	<1.52	0.91		<2.30	
NOV	<1.79	<1.76	1.41		<1.79	
DEC	<1.56	<0.94	<1.58	<1.75	<0.82	<1.76

NOTE: Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis of nuclides for which analyses are required by RBS Technical Specifications (that is, the nuclides may or may not have been present, but if so, there cannot have been more than the amounts noted).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclide Activity (pCi/liter) in Water by Location -1990

CESIUM-137

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<1.85	<1.55	<1.72		<1.84	
FEB	<2.24	<2.38	<2.59		<2.26	
MAR	<1.78	<1.80	<2.94	<2.20	<1.84	<2.28
APR	<1.84	<1.52	<1.80		<1.50	
MAY	<1.58	<1.56	<2.58		<1.84	
JUN	<1.83	<1.55	<1.83	<1.60	<1.82	<1.80
JUL	<1.73	<1.63	<1.69		<1.79	
AUG	<1.58	<1.82	<1.91	<1.62	<1.79	<1.82
SEP	<1.62	<1.85	<2.10		<1.73	
OCT	<2.48	0.61	0.92		1.14	
NOV	<1.81	<1.76	1.16		<1.92	
DEC	<1.78	<0.93	<1.81	<1.89	<0.86	<1.84

BARIUM-140

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<13.30	<18.40	<12.90		<14.50	
FEB	<23.80	<30.40	<23.70		<2.58	
MAR	<11.30	<15.90	<20.10	<8.40	<16.20	<2.29
APR	<11.10	<14.90	1.46		<12.20	
MAY	<19.30	<22.30	<25.70		<24.50	
JUN	<15.30	<15.70	<14.60	<7.21	<16.60	<7.24
JUL	< 1.60	<27.50	<27.80		<21.70	
AUG	<15.70	<17.30	<17.50	<19.30	<18.00	<19.80
SEP	<14.30	<15.90	<16.20		<14.80	
OCT	<23.90	<21.10	<27.60		<7.57	
NOV	<23.70	<21.40	<22.50		<18.50	
DEC	<19.90	<34.90	<19.50	<27.00	<31.70	<23.50

LANTHANUM-140

	INDICATOR LOCATIONS				CONTROL LOCATIONS	
PERIOD	SWD	DW	DL	WD	SWU	WU
JAN	<6.17	<6.82	<4.88		<6.30	
FEB	<11.10	<14.30	<10.20		<11.80	
MAR	<5.11	<6.93	<6.29	<4.09	<6.84	<2.42
APR	<4.53	<5.38	<3.78		<4.71	
MAY	<6.17	<8.45	<7.52		<9.43	
JUN	<6.37	<5.35	<5.71	<2.66	<6.77	<2.92
JUL	<8.05	<11.00	<10.50		<9.58	
AUG	<5.80	<6.24	<7.14	<6.59	<6.93	<7.39
SEP	<5.86	<6.75	<7.67		<6.47	
OCT	<11.20	<7.87	<10.70		<3.48	
NOV	<9.31	<7.45	<8.26		<7.68	
DEC	<8.23	<14.70	<6.74	<11.40	<12.10	<9.93

NOTE: Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis of nuclides for which analyses are required by RBS Technical Specifications (that is, the nuclides may or may not have been present, but if so, there cannot have been more than the amounts noted).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclides in Sediment (pCi/kg dry) by Location - 1990

	BERYLLIUM-7		POTASSIUM-40	
PERIOD	DOWNSTREAM	UPSTREAM	DOWNSTREAM	UPSTREAM
MAY		408.00	13706.00	16361.00
AUG			14524.00	4773.00

	CESIUM-134		CESIUM-137	
PERIOD	DOWNSTREAM	UPSTREAM	DOWNSTREAM	UPSTREAM
MAY	<9.77	<17.10	**10.00**	**74.60**
AUG	<17.70	<15.80	<21.10	<17.10

Gamma-Emitting Nuclides in Fish (pCi/kg wet) by Location - 1990

POTASSIUM-40

	DOWNSTREAM					UPSTREAM				
PERIOD	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5
FEB	4081									
MAR		3018								
JUL	2837		3002	3405				3508	3202	
DEC	3316			3336	2448	3231			2827	1377

MANGANESE-54

	DOWNSTREAM					UPSTREAM				
PERIOD	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5
FEB	<25.4									
MAR		<19.1								
JUL	<20.4		<18.0	<6.65				<4.45	<5.17	
DEC	<15.6			<34.4	<3.62	<14.9			<32.3	<3.38

IRON-59

	DOWNSTREAM					UPSTREAM				
PERIOD	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5
FEB	<62.8									
MAR		<47.0								
JUL	<46.6		<40.3	<22.5				<16.1	<17.6	
DEC	<67.8			<118	<17.3	<66.5			<92.6	<16.6

COBALT-58

	DOWNSTREAM					UPSTREAM				
PERIOD	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5
FEB	<25.2									
MAR		<20.4								
JUL	<20.6		<19.0	<18.3				<5.22	<6.18	
DEC	<23.3			<39.9	<5.35	<22.1			<38.5	<4.58

NOTE: Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis of nuclides for which analyses are required by RBS Technical Specifications (that is, the nuclides may or may not have been present, but if so, there cannot have been more present than the amounts listed).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclides in Fish (pCi/kg wet) by Location - 1990

COBALT-60

	DOWNSTREAM					UPSTREAM				
PERIOD	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5
FEB	<29.8									
MAR		<22.3								
JUL	<23.9		<23.0	<8.28				<5.10	<6.25	
DEC	<17.9			<40.8	<4.12	7.49			<32.7	<3.94

ZINC-65

	DOWNSTREAM					UPSTREAM				
PERIOD	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5
FEB	<63.4									
MAR		<45.2								
JUL	<45.8		<46.9	<18.7				<13.5	<14.9	
DEC	<40.1			<86.1	<9.89	<38.4			<68.1	<9.26

CESIUM-134

	DOWNSTREAM					UPSTREAM				
PERIOD	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5
FEB	<24.6									
MAR		<17.8								
JUL	<18.3		<15.9	<5.50				<3.62	<4.40	
DEC	<15.1			<36.0	<2.84	<13.5			<25.5	<2.84

CESIUM-137

	DOWNSTREAM					UPSTREAM				
PERIOD	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5
FEB	<25.1									
MAR		7.07								
JUL	<22.2		<18.9	<6.74				1.67	<5.04	
DEC	<14.8			<33.2	<2.99	<13.7			<25.1	<2.97

NOTE: Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis of nuclides for which analyses are required by RBS Technical Specifications (that is, the nuclides may or may not have been present, but if so, there cannot have been more present than the amounts listed.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclide Activity (pCi/kg wet) in Broadleaf Vegetation by Location - 1990

BERYLLIUM-7

	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	RBS GARDEN #1			RBS GARDEN #2			ANGOLA PENITENTIARY		
PERIOD	#1	#2	#3	#1	#2	#3	#1	#2	#3
JAN	211	297	470				2292		
FEB	145	296	196				602	2665	
MAR	184				128	303	218		
APR	264					154			
MAY				256	445	128	191	377	221
JUN	115	140			236		204	165	256
JUL	734	749	444	330	1494	155	164	1060	782
AUG	257	230	156	297	191	282	56	360	436
SEP	110	2040	253		206		130	389	653
OCT		115	120	164		91			
NOV	196		153		77	139			
DEC	505				107	71		157	113

POTASSIUM-40

	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	RBS GARDEN #1			RBS GARDEN #2			ANGOLA PENITENTIARY		
PERIOD	#1	#2	#3	#1	#2	#3	#1	#2	#3
JAN	4970	4468	2691	4226	4923		4279		
FEB	4184	4616	4756	4761	3607	4783	4856	2575	
MAR	4612			3485	4352	3635	5680		
APR	4461	4218	4483	3880	4529	3875	5427		
MAY	1820	1645	1906	2937	4023	4716	5766	5750	8267
JUN	2226	2073	2100	4948	4893	3950	3133	5632	7762
JUL	3910	1645	3372	5229	5099	5176	4202	4674	5544
AUG	4000	2158	3292	4149	2487	3362	3778	5895	3802
SEP	2801	2114	2112	3152	4270	5203	2750	6864	2909
OCT	3704	1539	1616	2782	4926	2997	4056	3284	3853
NOV	1775	1854	2939	3249	3290	5011	1926	2474	2543
DEC	3091	2567	1552	2591	5435	2521	2629	3175	3375

BARIUM-140

	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	RBS GARDEN #1			RBS GARDEN #2			ANGOLA PENITENTIARY		
PERIOD	#1	#2	#3	#1	#2	#3	#1	#2	#3
OCT			47.2						

NOTE: Sampling requirement for vegetation is one sample of each of three different types from each location per month. Due to lack of availability, only one control sample was obtained in January, March, and April, and only two control samples obtained in February. Likewise, only one sample from G1 was obtained during March and only two samples from G2 were taken in January.

Activities shown are values actually measured.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclide Activity (pCi/kg wet) in Broadleaf Vegetation by Location - 1990

IODINE-131

	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	RBS GARDEN #1			RBS GARDEN #2			ANGOLA PENITENTIARY		
PERIOD	#1	#2	#3	#1	#2	#3	#1	#2	#3
JAN	<25.5	<24.6	<34.2	<28.0	<26.6		<39.5		
FEB	<26.2	<29.0	<31.3	<23.8	<23.3	<26.8	<29.2	<44.9	
MAR	<29.3			<23.7	<30.4	<26.2	<28.6		
APR	<30.4	<32.0	<26.0	<25.6	<22.3	<27.0	<23.8		
MAY	<22.0	<27.6	<25.8	<26.1	<25.9	<31.8	<22.6	<26.0	<25.1
JUN	<28.6	<24.7	<26.5	<29.3	<24.6	<25.0	<30.5	<25.4	<61.0
JUL	<22.2	<23.3	<22.1	<28.6	<27.2	<25.3	<26.2	<33.2	<20.2
AUG	<27.8	<22.5	<28.6	<31.5	<20.4	<24.4	<32.1	<28.5	<31.2
SEP	<19.9	<24.6	<22.6	<21.1	<28.2	<22.1	<21.2	<30.1	<28.4
OCT	<23.5	<21.1	<24.6	<23.3	<31.8	<16.2	<22.7	<26.6	<26.4
NOV	<19.5	<20.5	<20.2	<18.9	<19.6	<17.8	<24.1	<26.7	<26.5
DEC	<22.2	<23.6	<19.8	<17.8	<17.5	<15.2	<23.6	<21.6	<16.9

CESIUM-134

	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	RBS GARDEN #1			RBS GARDEN #2			ANGOLA PENITENTIARY		
PERIOD	#1	#2	#3	#1	#2	#3	#1	#2	#3
JAN	<30.7	<26.8	<39.3	<34.6	<28.0		<43.5		
FEB	<22.6	<30.5	<30.0	<23.9	<27.0	<28.1	<34.6	<42.8	
MAR	<35.8			<29.6	<33.3	<26.9	<28.7		
APR	<29.6	<39.1	<33.5	<29.2	<27.6	<28.5	<23.0		
MAY	<26.6	<23.7	<26.5	<26.9	<30.5	<29.1	<25.8	<27.1	<23.7
JUN	<26.3	<21.9	<24.1	<27.5	<28.3	<27.1	<29.4	<24.8	<26.8
JUL	<23.4	<22.0	<20.7	<27.8	<26.3	<23.4	<16.8	<21.6	<9.71
AUG	<29.6	<25.0	<26.4	<34.1	<24.2	<21.5	<21.5	<19.1	<23.1
SEP	<20.9	<23.2	<24.9	<20.4	<25.9	<19.2	<19.7	<30.3	<26.0
OCT	<22.1	<22.1	<24.0	<21.7	<30.2	<15.4	<22.0	<26.6	<20.9
NOV	<20.7	<22.8	<25.9	<20.5	<19.8	<17.3	<23.0	<30.3	<29.8
DEC	<23.0	<28.4	<24.5	<19.4	<18.5	<17.5	<24.8	<18.2	<19.4

CESIUM-137

	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	RBS GARDEN #1			RBS GARDEN #2			ANGOLA PENITENTIARY		
PERIOD	#1	#2	#3	#1	#2	#3	#1	#2	#3
JAN	<34.1	<29.3	<42.1	<31.5	<31.7		<43.3		
FEB	<31.6	<38.8	<33.0	<31.1	<24.5	<24.6	<35.8	<51.1	
MAR	<35.4			<29.5	<39.6	<33.0	<30.7		
APR	<34.1	<37.7	<32.9	<31.5	<29.6	<35.7	<24.2		
MAY	<32.9	<33.4	<34.3	<35.9	<28.1	<26.1	<28.2	<31.5	<25.7
JUN	**19.4**	<29.8	15.8	<29.6	<27.7	<31.4	<26.8	<28.7	<32.1
JUL	**27.6**	<30.3	<24.9	<30.4	<32.9	<25.3	<25.3	<34.0	<11.8
AUG	**20.7**	<32.4	<34.4	<33.3	<27.6	<23.2	<25.1	**11.6**	<24.3
SEP	<26.1	<29.0	<27.7	<24.2	<28.3	<25.3	<27.2	<32.2	<28.0
OCT	<31.0	<24.7	**16.6**	<25.3	<33.4	<19.7	<25.9	<28.9	<28.6
NOV	<28.2	<24.1	<27.6	<25.1	<21.6	<21.2	<28.9	<31.0	<31.2
DEC	<27.2	<27.9	<22.9	<18.4	<19.0	<19.1	<28.2	<24.3	<22.1

NOTE: Sampling requirement for vegetation is one sample of each of three different types from each location per month. Due to lack of availability, only one control sample was obtained in January, March, and April, and only two control samples obtained in February. Likewise, only one sample from G1 was obtained during March and only two samples from G2 were taken in January.

Activities shown are values actually measured, whereas those indicated as "<" are minimum detectable activities (MDAs) under the particular conditions of analysis of nuclides for which analyses are required by RBS Technical Specifications (that is, the nuclides may or may not have been present, but if so, there cannot have been more present than the amounts listed.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1990

APPENDIX B

Summary of Preoperational REMP (Baseline) Results

Table B.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 B.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 1 of 4)

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.	Mean(f)[2] Range	Control Locations Mean (f)[2] Range	Number of Nonroutine Reported Results
Air Particulate (pCi/m^3)	Gross Beta (1086)	0.01	0.03 (757/759) 0.01 - 0.09	AQS2 5.8 km NW	0.03(146/158) 0.0 - 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 Radiojodine (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](5 6.5 - 2	N/A
Surface Water (pCi/liter)	H-3 (24)	2000	ALL <LLD			ALL <LLD	N/A
	Mn-54 (66)	15	ALL <LLD			ALL <LLD	N/A
	Co-58 (65)	15	ALL <LLD			ALL <LLD	N/A
	Fe-59 (65)	30	ALL <LLD			ALL <LLD	N/A
	Co-60 (65)	15	ALL <LLD			ALL <LLD	N/A
	Zn-65 (65)	30	ALL <LLD			ALL <LLD	N/A
	Nb-95 (65)	15	ALL <LLD			ALL <LLD	N/A
	Zr-95 (65)	30	ALL <LLD			ALL <LLD	N/A
	I-131 (65)	15	ALL <LLD			ALL <LLD	N/A
	Cs-134 (65)	15	ALL <LLD			ALL <LLD	N/A
	Cs-137 (65)	18	ALL <LLD			ALL <LLD	N/A
	Ba-140 (65)	60	ALL <LLD			ALL <LLD	N/A
	La-140 (65)	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

TABLE B.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 2 of 4)

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	Mean(f)[2] Range	Control Locations Mean (f)[2] Range	Number of Nonroutine Reported Results
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
	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 B.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 3 of 4)

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.	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	Donaldsonville 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			ALL <LLD	N/A
	Cs-137	180	ALL <LLD			ALL <LLD	N/A
Milk (pCi/liter)	K-40[6] (18)	NONE	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
	Cs-137 (82)	18	ALL <LLD			ALL <LLD[7]	N/A
	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

TABLE B.1

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

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
Fish/ Invertebrates	Co-58 (15)	130	ALL <LLD			ALL <LLD	N/A
(continued)	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	K-40[6] (11)	NONE REQUIRED	3368 (6/10) 1398 - 5389	G2 1.1 km NW	3368 (6/10) 1398 - 5389	3768 single value	N/A
(pCi/kg wet)	I-131 (75)	60	ALL <LLD[7]			ALL <LLD	N/A
	Cs-134 (76)	60	ALL <LDD			ALL <LLD	N/A
	Cs-137 (76)	80	97 (4/43) 59 - 129	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 comparisons.

6. The values 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 5 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).