



GULF STATES UTILITIES COMPANY

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Gentlemen:

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

Enclosed is the Annual Radiological Environmental Operating Report for 1992. 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,

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and Quality Verification
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RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

RIVER BEND STATION

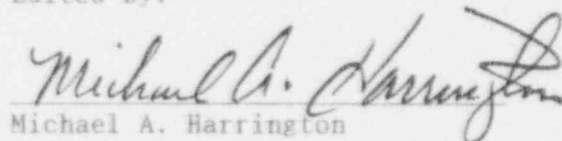
FOR THE OPERATING PERIOD

January 1, 1992 - December 31, 1992


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Abstract

During 1992, 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 93.5 percent of analytical results within control limits. The land use census revealed 2 salient changes in receptor locations since 1991. Twenty monitoring exceptions occurred out of a total effort of 1,996 samples collected and 2,524 subsequent analyses performed. Seventeen of these exceptions involved samples/analyses required by Technical Specification, but none had a 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 above baseline levels in the vicinity of RBS during 1991, which are attributed to plant operation, are the expected low levels in the liquid discharge line. The levels of activity measured in environmental media and in the liquid discharge were below the required levels of detection, and therefore substantially below Technical Specification reporting levels. Thus the 1992 Radiological Environmental Monitoring Program substantiated the adequacy of source control and effluent monitoring at River Bend Station.

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1.0 INTRODUCTION

This Annual Radiological Environmental Operating Report for the period of January 1 through December 31, 1992, 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 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 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).

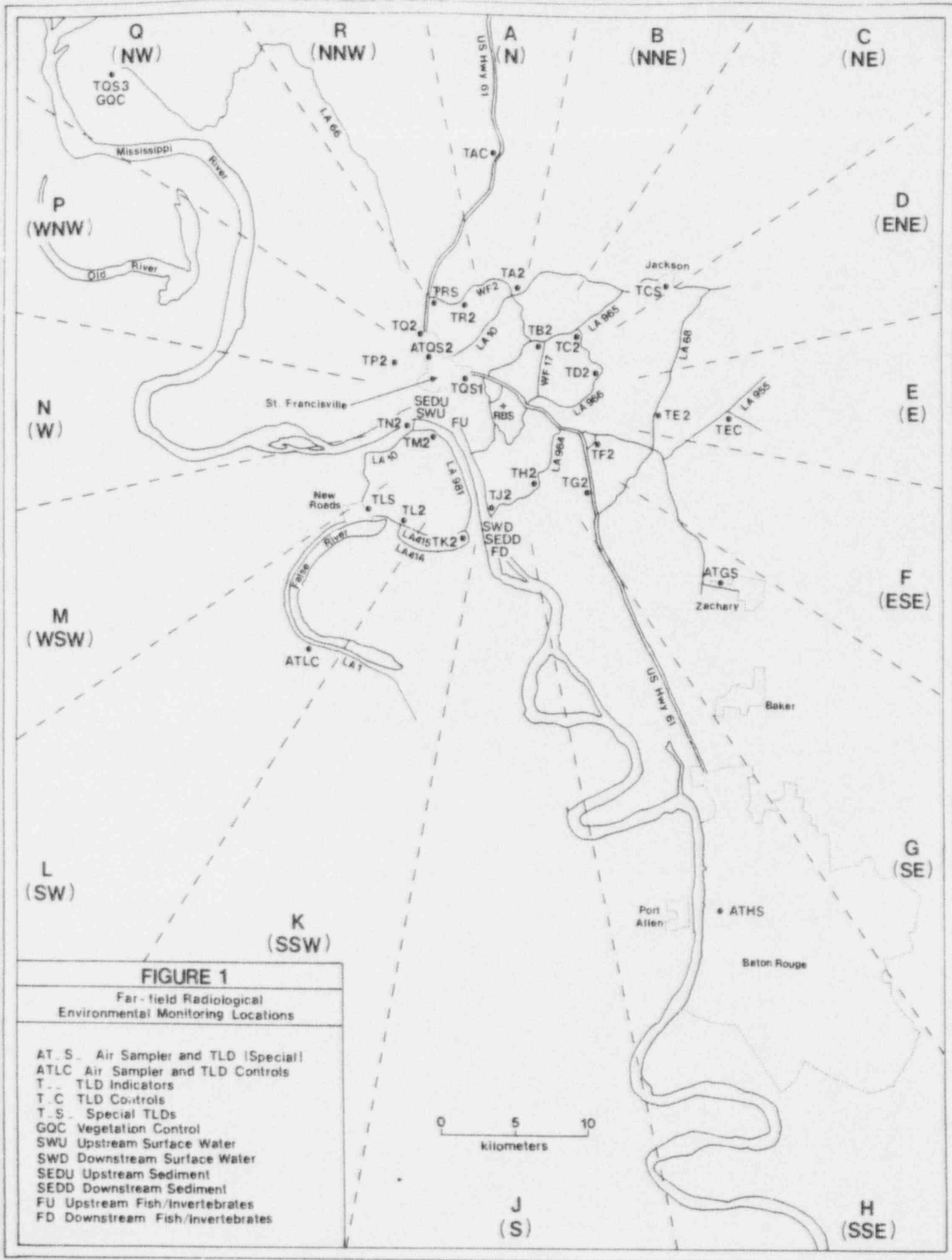
The area within an 80-km radius of RBS contains all or portions of 19 Louisiana parishes and five Mississippi counties. This area has generally the same makeup as that of the immediate vicinity of RBS, although wetlands, agricultural lands, and urban/improved lands are relatively more extensive (at the 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 1992, 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.

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



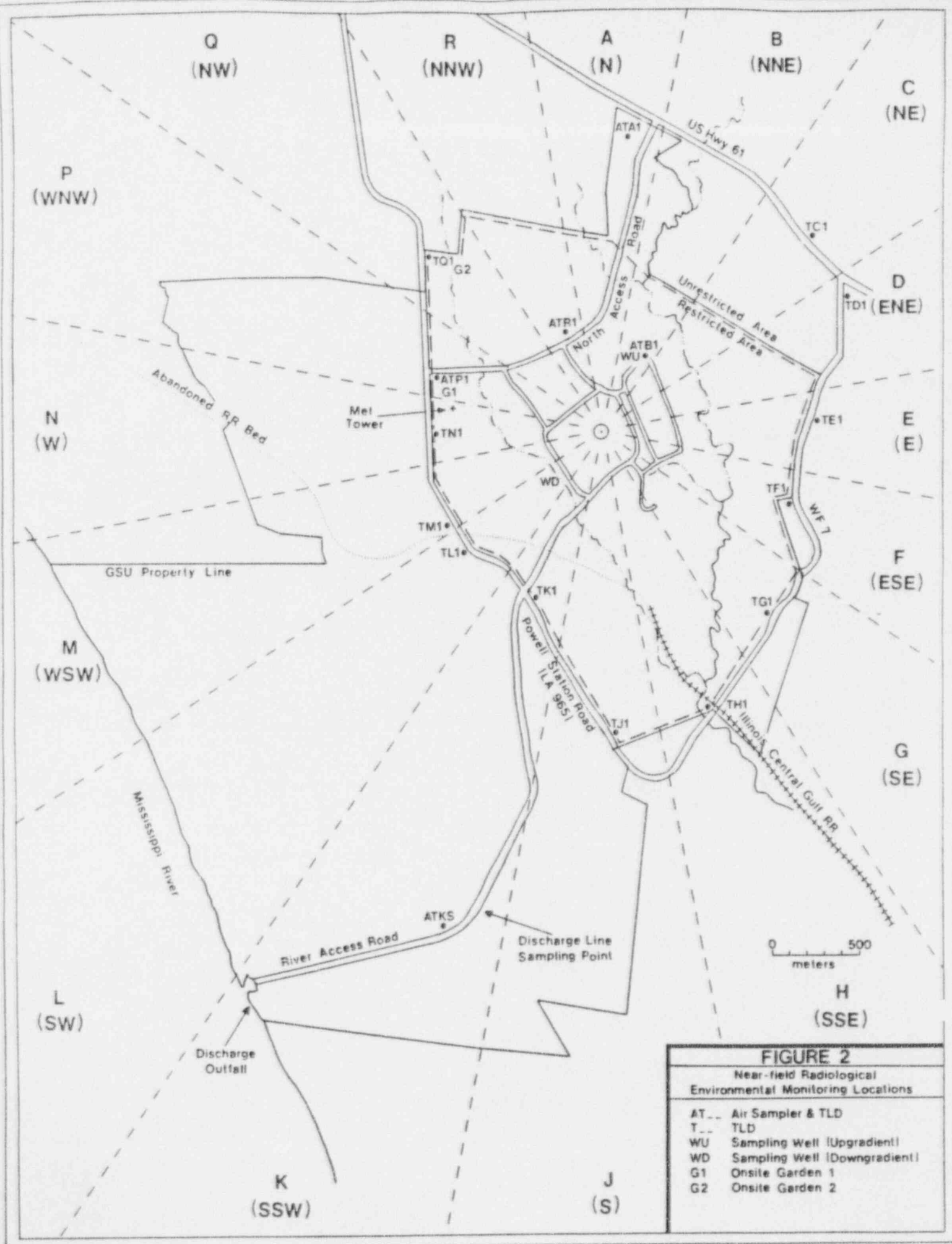


FIGURE 2

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

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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)	<u>Airborne Pathway</u>	<u>Monitoring Media</u>
	Immersion Dose (external)	Air Samples (Particulates and Radioiodines)
	Ingestion Dose (internal)	Vegetation/Food Crop Samples, Air Samples
(B)	<u>Direct Exposure Pathway</u>	<u>Monitoring Media</u>
	External Dose	Thermoluminescence Dosimetry (TLD) Area Monitors
(C)	<u>Waterborne Pathway</u>	<u>Monitoring Media</u>
	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

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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 1992

The annual land use census, which implements Section IV.B.3 of Appendix I of 10CFR50, was conducted during the 1992 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 1991.

The 1992 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 Q (NNW) was 1.3 km, versus 1.4 km in 1991. 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). A receptor garden was located in sector E at 2.2 km during the 1992 census.

No dairy animals were found within 8 km of RBS during the 1992 census; milk goats were located at 9 km in sector A (N). Historically, there had never been enough dairy sites to accommodate the minimum RBS Technical Specification requirements for analysis of milk, 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). During the 1991 census, meat animals were located in sector L (SW) at 4.6 km. No changes were observed in the meat animal census during the 1992 census.

2.4 Interlaboratory Comparison Program Results for 1992

The Environmental Services Group participated in the U.S. Environmental Protection Agency (USEPA) Laboratory Intercomparison Program during 1992 in accordance with RBS Technical Specification 3/4.12.3. RBS results (Table 3) were within the control limits for the normalized range (precision) for all analyses, and within the USEPA "known" value (accuracy) for all but four analyses. The discrepancy for these analyses is discussed below. The USEPA discontinued the cross-check media for "food" in 1989, and although milk sampling and analysis is not

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TABLE 1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Airborne Particulates and Radioiodines	Samples from 9 Locations: INDICATOR STATIONS		
	AA1. River Bend Training Center; 1.7 km N.	Continuous air sampler with filter collection weekly or as required by dust loading, whichever is more frequent.	Charcoal cartridge; analysis weekly for radioiodine.
	AB1. River Bend Station North Access Road across from plant entrance; 0.6 km NNW.		Particulate filter; analysis weekly for gross beta and gamma isotopic activity ³ following filter changes.
	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).		Composite particulate filters; analysis quarterly for gamma isotopic activity.
	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		
	ABS. 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 exposure 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; 5 km N.		
	TE1. River Bend Station cooling tower yard; 0.5 km NNE.		
	TE2. Stub pole at Jct of La Hwy 965 and Audubon Lane (WF 17); 5 km NNE.		
	TC1. Stub pole at Jct of US Hwy 61 and Old Highway 61; 1.7 km NE.		
	TC2. Stub pole along La Hwy 966, 0.6 km south of Jct of La Hwys 966 and 965; 7 km NE.		
	TD1. Stub pole along WF 7, 150 meters south of Jct of WF 7 and US Hwy 61; 1.6 km ENE.		
	TD2. Stub pole along La Hwy 966, 4 km south of Jct of La Hwys 966 and 965; 6.3 km ENE.		

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TABLE 1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Direct Radiation (continued)	<p>TE1. Stub pole along WF 7, 1 km south of Jct of wf 7 and US Hwy 61; 1.3 km E.</p> <p>TE2. Gravel Power Center on La Hwy 68, 2 km north of Jct of La Hwys 68 and 964; 10 km E.</p> <p>TF1. Stub pole along WF 7, 1.6 km south of Jct of WF 7 and US Hwy 61; 1.3 km ESE.</p> <p>TF2. On La Hwy 954, 0.6 km north of Jct of La 954 and US Hwy 61; 6 km ESE.</p> <p>TG1. Stub pole along WF 7, 2 km south of Jct of WF 7 and US Hwy 61; 1.6 km SE.</p> <p>TG2. Telephone pole at gate to Marathon Tank Farm on US Hwy 61, near Delombre; 7.5 km SE.</p> <p>TH1. Stub pole at Illinois Central Gulf Railroad crossing of WF 7 (near Grants Bayou); 1.7 km SSE.</p> <p>TH2. First telephone pole on La Hwy 964 north of the entrance to James River Corporation paper mill; 5.5 km SSE.</p> <p>TJ1. Stub pole near River Bend Station gate #23 on La Hwy 965; 1.5 km S.</p> <p>TJ2. Large tree along River Road, 100 meters north of James River Corporation intake structure; 5.8 km S.</p> <p>TK1. CSU utility pole #L10178 on La Hwy 965, 20 meters south of RBS River Access Road; 0.9 km SSW.</p> <p>TK2. Stub pole at Jct of La Hwys 414 and 415; 8 km SSW.</p> <p>TL1. Second utility pole on La Hwy 965 south of former Illinois Central Gulf Railroad crossing; 1.0 km SW.</p> <p>TL2. Second utility pole along La Hwy 415 east of Louisiana & Arkansas Railroad crossing (near Patin's Dike); 9.5 km SW.</p> <p>TM1. First utility pole on La Hwy 965 north of former Illinois Central Gulf Railroad crossing; 0.9 km WSW.</p> <p>TM2. Utility pole along La Hwy 981, about 3 km south of Jct of La Hwys 981 and 10; 4.2 km WSW.</p> <p>TN1. Utility pole along La Hwy 965, between RBS gates #13 and #14; 0.9 km W.</p>	<p>Thermoluminescence dosimeters (TLDs); deployment/retrieval monthly and quarterly.³</p>	<p>Gamma exposure monthly and quarterly.³</p>

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TABLE 1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Direct Radiation (continued)	<p>TN2. Utility pole with electrical meter near west bank ferry landing (La Hwy 10); 6 km W.</p> <p>TP1. Near RBS Onsite Garden #1; 0.9 km WNW.</p> <p>TP2. Stub pole about 1.5 km north of former ICG RR trestle on Tunica Street, western outskirts of St. Francisville; 7.3 km WNW.</p> <p>TQ1. CSU property sign along La Hwy 965 about 1 km north of RBS North Access Road; 1.4 km NW.</p> <p>TQ2. CSU pole at Jct of North Commerce and American Beauty Streets, St Francisville; 6.9 km NW.</p> <p>TR1. RBS North Access Road across from plant entrance; 0.5 km NNW.</p> <p>TE2. Tree along north side of WF 2, past Jacock Road, about 1.8 km east of Jct of WF 2 and US Hwy 61; 5 km NNW.</p> <p>CONTROL AND SPECIAL INTEREST STATIONS¹</p> <p>TAC. Telephone pole along US Hwy 61 about 200 meters north of Hamilton Station Water Tower, near Wakefield; 18 km N.</p> <p>TEC. Stub pole at Jct of La Hwy 955 and Midway Road, 4.8 km north of Jct of La Hwys 955 and 964; 16 km E.²</p> <p>TLC. Parlange Power Center in Oscar; 20 km SW.</p> <p>TCS. Utility pole at gate to East Louisiana State Hospital in Jackson; 12.3 km NE.</p> <p>TGS. CSU Service Center compound in Zachary; 17 km SE.</p> <p>TBS. Roof of CSU Office Building, North Boulevard, Baton Rouge; 40 km SSE.</p> <p>YKS.² RBS River Access Road; 2.8 km SSW.</p> <p>TLS. Utility pole near False River Academy sign at edge of New Roads; 9.7 km SW.</p> <p>TQS1. Behind Pentecostal Church (opposite West Feliciana Hospital) near Jct of US Hwy 61 and Ferdinand Street; 4 km NW.</p> <p>TQS2. St. Francis Substation on US Hwy (Business) 61 in St. Francisville; 5.8 km NW.</p>	<p>Thermoluminescence dosimeters (TLDs); deployment/retrieval monthly and quarterly.³</p>	<p>Gamma exposure monthly and quarterly.³</p>

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TABLE 1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Direct Radiation (continued)	<p>TQS3. Utility pole at Louisiana State Penitentiary dairy, near Angola; 35 km NW.</p> <p>TRS. Stub pole at Jct of WF 2 and US Hwy 61, near Bains (West Feliciana High School); 9.2 km NNW.²</p>	Thermoluminescence dosimeters (TLDs); deployment/retrieval monthly and quarterly. ³	Gamma exposure monthly and quarterly. ⁴
Waterborne	<p style="text-align: center;">SURFACE WATER⁴</p> <p>SWU. Mississippi River about 4 km upstream from the RBS liquid discharge, near La Hwy 10 ferry crossing.</p> <p>SWD. Mississippi River about 4 km downstream from the RBS liquid discharge, near the James River Corporation paper mill.</p> <p>DL. RBS liquid discharge line at the blowdown control structure along the River Access Road.</p> <p style="text-align: center;">DRINKING WATER⁶</p> <p>Nearest downstream water supply: IH-10 bridge in Baton Rouge, 53.9 km downstream from the RBS liquid discharge; or People's Water Service Company in Donaldsonville, 135 km downstream from the RBS liquid discharge.</p> <p style="text-align: center;">GROUNDWATER</p> <p>WD. Upland Terrace Aquifer well, downgradient from the plant, about 470 meters SW.</p> <p>WU. Upland Terrace Aquifer well, upgradient from the plant, about 470 meters NNE (control).</p> <p style="text-align: center;">SHORELINE SEDIMENT</p> <p>SEDD. East shore of the Mississippi River, about 4 km downstream from the plant, near the James River Corporation paper mill.</p> <p>SEDU. East shore of the Mississippi River, about 4 km upstream from the plant, near the La Hwy 10 ferry.²</p>	<p>Weekly grabs, composited over monthly and quarterly periods.</p> <p>Flow-weighted hourly grabs, composited monthly and quarterly.</p> <p>Weekly grabs, composited over monthly and quarterly periods.</p> <p>Quarterly grab.</p> <p>Semiannual grab.</p>	<p>Monthly composite: gamma isotopic, tritium⁵ and gross beta analysis⁵. Qtrly composite: tritium analysis.</p> <p>Monthly composite: gamma isotopic, tritium⁵ and gross beta analysis⁵. Qtrly composite: tritium analysis.</p> <p>Gross beta, gamma isotopic, and tritium analyses quarterly⁵.</p> <p>Gamma isotopic analysis semiannually.</p>
Ingestion	<p style="text-align: center;">FISH AND INVERTEBRATES</p> <p>FD. One sample of each of three commercially and/or recreationally important species from the downstream area influenced by the RBS liquid discharge.</p>	Semiannually or seasonally, when available.	Gamma isotopic analysis on edible portions semiannually or seasonally.

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TABLE 1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
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Exposure Pathway and/or Sample	Sample Point Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
Ingestion	FISH AND INVERTEBRATES		
	FU. One sample of each of three commercially and/or recreationally important species from the upstream area not influenced by the RBS liquid discharge (control). ⁷	Semiannually or seasonally, when available.	Gamma isotopic analysis on edible portions semiannually or seasonally.
	PRODUCE ⁸		
	G1/G2. Two samples of each of three different types of leafy vegetables from onsite gardens near the site boundary in areas of highest calculated average ground-level D/Q; 1 km WNW and 1.1 km NW.	Monthly during the growing season.	Gamma isotopic and I-131 analyses monthly.
	GQC. One sample of each of three different kinds of leafy vegetables from the Louisiana State Penitentiary at Angola; 35 km NW (control).		

NOTES:

- (1) For purposes of data summary, comparisons, and discussion, the sampling locations designated as "Special Interest" are treated as indicator stations if they are within 16 km of RBS and control stations if they are beyond 16 km.
- (2) Sample/measurement location not required by RBS Technical Specifications (not identified in ODCM).
- (3) Sampling and/or analysis frequency greater than required by RBS Technical Specifications and ODCM.
- (4) The upstream (control) sample is taken at a distance beyond influence of the plant discharge. The downstream (indicator) sample is taken in an area beyond but near the mixing zone.
- (5) Gross beta analysis not required by RBS Technical Specifications and ODCM.
- (6) Drinking water sampling/analyses not required by RBS Technical Specifications and ODCM. (No drinking water pathway exists due to extreme distance 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.

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TABLE 2
RESULTS OF LAND USE CENSUS

Sector	Nearest Residence	Range (km)	Nearest Garden	Range (km)	Nearest Dairy	Range (km)	Nearest Meat Animal	Range (km)
A (N)	Jones	1.8	Jones	1.8	-	-	Daniel, H.	3.0
B (NNE)	Dreher	1.6	Harvey	1.8	-	-	Harvey	1.5
C (NE)	Magee	1.5	Magee	1.5	-	-	Daniel, H.	1.7
D (ENE)	Lambert	1.4	Daniel, E.I.	1.6	-	-	Lambert	1.4
E (E)	Bickham	2.2	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	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)	-	-	-	-	-	-	Bergeron	4.6
M (WSW)	-	-	-	-	-	-	Langois	5.0
N (W)	Lacost	6.1	-	-	-	-	Langois	5.0
P (WNW)	Green	3.5	GSU #1	0.96	-	-	Hardovin	7.4
Q (NW)	Davis ¹	1.3	GSU #2	1.07	-	-	Cole	1.3
R (NNW)	Young	1.7	Monroe	3.0	-	-	Vessel	3.0

¹ The 1992 receptor location was nearer than the receptor location listed in 1991.

² There was no receptor location listed for 1991.

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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 1992 operating period, out of a total effort of 1,996 samples collected and 2,524 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.

Air Particulates and Radioiodines:

Twelve program exceptions, with lost of sample/sample volume, occurred involving air particulate and radioiodine sampling. Eight of these exceptions occurred during the refueling outage (3/12/92 to 9/8/92), when the plant was not running. Two of these eight are locations not required by Technical Specifications (AKS, AHS). The location AHS also experienced a power outage in January, 1992. Nine of the twelve exceptions were due to unknown reasons, or storm/weather related power outages. Three outages were a result of equipment failures which may have been weather related. In spite of the numerous power failures, samples were collected and analyzed from all locations with adequate volumes to achieve all required detection limits with the exception of location AKS (5/19/92 to 5/26/92).

Direct Radiation (TLD):

Data for two quarterly and two monthly TLD badges at locations (TAC, TM1) was lost due to vandalism. Monthly data for two TLD locations (TCS, TD2) was lost due to badges being misplaced and delivered to dosimetry section too late to be read. The data for the two quarterly TLD locations (TAC, TM1) was replaced with monthly data at those locations.

USEPA Cross-check:

During the analysis of potassium in the USEPA milk study of 4/24/92, the activity measured for potassium-40 was incorrectly converted to mass of total potassium. With the correct conversion applied, RBS would have reported 1,632 mg for total potassium, well within the control limits established for this study.

The results of both the USEPA iodine-in-water study of 2/7/92 and the iodine-in-milk study of 4/24/92 were below the control limits established for these tests. RBS's investigation determined that an inferior lot of anion exchange resin was used during the analyses of these samples: RBS contacted the resin supplier to resolve the problems observed in the I-131 analysis procedure. A fresh I-131 standard was obtained from EPA to check RBS' preparation/analysis procedures.

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TABLE 3
USEPA INTERCOMPARISON (CROSS-CHECK) PROGRAM PARTICIPATION RESULTS

SAMPLE TYPE (units)	DATE	ANALYSIS	USEPA "KNOWN" VALUE ^a	RBS VALUE	RBS N-DEV ^b	RBS N-RANGE ^c	AVERAGE RESULT ^d
AIR FILTER (pCi/filter)	3/27/92	Beta	41.00±8.70	43.67	+0.92	0.236	42.32±3.31
	3/27/92	Cs-137	10.00±8.70	9.67	-0.12	0.236	11.02±2.05
	8/28/92	Beta	69.00±17.3	73.00	+0.69	0.177	71.98±6.43
	8/28/92	Cs-137	18.00±8.70	17.00	-0.35	0.591	19.68±2.94
Milk ^e	4/24/92	I-131	78.00±13.90	60.67 ^f	-3.75 ^f	0.074	78.45±6.07
	4/24/92	Cs-137	39.00±8.70	34.67	-1.50	0.118	40.32±3.59
	4/24/92	K (nat)	1710.00±149.2	1550.67 ^f	-3.21 ^f	0.117	1704.01±105.51
WATER (pCi/liter)	1/31/92	Beta	30.00±8.70	27.00 ^g	(-1.04)	(0.472)	29.88±5.42
	2/07/92	I-131	59.00±10.4	44.67 ^f	-4.14 ^f	0.095	60.16±5.54
	2/14/92	Co-60	40.00±8.70	40.33	+0.12	0.118	40.05±3.38
	2/14/92	Zn-65	148.00±26.00	155.67	+0.89	0.512	148.85±9.10
	2/14/92	Ru-106	203.00±34.70	182.67	-1.76	0.148	194.60±18.25
	2/14/92	Ba-133	76.00±13.9	75.33	-0.14	0.074	75.06±5.77
	2/14/92	Cs-134	31.00±8.70	28.67	-0.81	0.236	29.44±2.69
	2/14/92	Cs-137	49.00±8.70	51.33	+0.81	0.473	50.69±3.69
	2/21/92	H-3	7904±1371	7432.00	-1.03	0.146	7942.78±702.0
	4/14/92	Beta	140.00±36.4	112.33	-2.28	0.366	118.11±16.91
	4/14/92	Cs-134	24.00±8.70	22.00	-0.69	0.236	23.42±2.02
	4/14/92	Cs-137	22.00±8.70	22.33	+0.12	0.118	23.20±2.35
	4/14/92	Co-60	56.00±8.70	56.33	+0.12	0.118	56.44±2.97
	5/15/92	Beta	44.00±8.70	40.67	-1.15	0.112	42.79±6.51
	6/05/92	Co-60	20.00±8.70	20.33	+0.12	0.118	20.61±2.28
	6/05/92	Zn-65	99.00±17.3	104.33	+0.92	0.295	104.65±7.49
	6/05/92	Ru-106	141.00±24.30	127.33	-1.69	0.591	138.47±11.86
	6/05/92	Ba-133	98.00±17.30	97.00	-0.17	0.118	96.17±7.10
	6/05/92	Cs-134	15.00±8.70	14.00	-0.35	0.000	14.76±1.99
	6/05/92	Cs-137	15.00±8.70	15.67	+0.23	0.118	16.11±3.83
	6/19/92	H-3	2125±602	1969.67	-0.78	0.151	2101.61±221.34
	8/07/92	I-131	45.00±10.4	37.00	-2.31	0.394	45.91±3.79
	9/18/92	Beta	50.00±8.70	73.33 ^f	+8.05 ^f	0.827	48.61±9.14
	10/09/92	Co-60	10.00±8.70	10.33	+0.00	0.000	10.96±2.10
	10/09/92	Zn-65	148.00±26.00	157.67	+1.12	0.158	157.10±9.35
	10/09/92	Ru-106	175.00±31.20	149.33	-2.47	0.492	160.69±14.64
	10/09/92	Ba-133	74.00±12.10	74.00	+0.00	0.000	73.05±5.18
	10/05/92	Cs-134	8.00±8.35	7.33	-0.23	0.118	8.14±1.64
	10/05/92	Cs-137	8.00±8.35	9.67	+0.58	0.118	8.73±1.70
	10/20/92	Beta	53.00±17.3	43.33	-1.67	0.118	46.53±6.55
	10/20/92	Cs-134	5.00±6.85	4.67	-0.12	0.118	5.33±1.45
	10/20/92	Cs-137	8.00±8.35	9.00	+0.35	0.000	8.86±1.76
	10/20/92	Co-60	15.00±8.70	15.67	+0.23	0.118	15.31±1.97
	10/23/92	H-3	5962±1034	5538.00	-1.23	0.412	5997.4±565.83

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 out of the control limits; refer to the program exceptions.
- (g) Analyses performed but results not reported to USEPA (thus not included in participants' average).

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MONITORING PROGRAM EXCEPTIONS

SAMPLE TYPE	PERIOD	LOCATION	EXCEPTION/REASON
Air Particulates and Radioiodine	01/07 - 01/14/92	AHS*	About 7% of weekly sample volume not collected due to power outage.
	01/14 - 01/20/92	AA1, AB1*, AR1, AKS*, AP1	About 1.6% of weekly sample volume not collected due to power outage.
	01/27 - 02/03/92	AA1, AB1*, AR1, AKS*, AP1	About 1% of weekly sample volume not collected due to power outage.
	01/27 - 02/03/92	AQS2	About 14% of weekly sample volume not collected due to equipment malfunction.
	04/13 - 04/22/92	AA1, AB1*, AR1	About 2% of weekly sample volume not collected due to power outage.
	04/13 - 04/22/92	AP1	About 5.5% of weekly sample volume not collected due to power outage.
	05/11 - 06/01/92	AKS*	About 42.5% of the 3 contiguous weekly sample volumes not collected due to extended power outage.
	05/11 - 05/19/92	AP1	About 2.4% of weekly sample volume not collected due to power outage.
	06/15 - 06/22/92	AA1	About 63.3% of weekly sample volume not collected due to tripped breaker.
	08/10 - 08/17/92	AHS*	About 0.8% of weekly sample volume not collected due to power outage.
	08/24 - 09/01/92	All Locations	Weekly sample volumes ranging from 5% to 85% not collected due to Hurricane Andrew power outages.
	09/01 - 09/08/92	ALC	About 13.2% of weekly sample volume not collected due to power outage.
TLD's	05/92	TCS*, TD2	No data for period due to personnel error: TLD badges not delivered to lab for read/anneal.
	10/92 & 4th Quarter 1992	TAC	No data for period: TLD badges were missing/stolen.
	12/92 & 4th Quarter 1992	TM1	No data for period: TLD badges were missing/stolen.
EPA Cross-Check	04/24/92	K-total, milk	K-40 activity incorrectly converted to total potassium, personnel error.
	02/07/92	I-131 in water	Results below Control limits of study due to inferior ion-exchange resin.
	04/24/92	I-131 in milk	
	09/18/92	Gross Beta in water	Results above Control limits of study due to high salt density

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

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MONITORING PROGRAM EXCEPTIONS

SAMPLE TYPE	PERIOD	LOCATION	EXCEPTION/REASON
Surface Water	02/92	DL	The percent recovery of I-131 by ion exchange resin extraction of water samples was re-evaluated when RBS results for the 2/7/92 USEPA cross-check sample for I-131 in water and the 4/24/92 cross-check sample for I-131 in milk were found to be outside the lower control limits for the analysis. As part of the investigation, the percent recovery achieved with the cross-check sample for I-131 in water was applied to the results for samples prepared with the same batch of resin. The adjusted MDAs achieved for I-131 for these samples were slightly above the specified LLD requirement for these samples.
	04/92	DW	
	04/92	SWU	
	05/92	DL	

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USEPA Cross-check

Surrogate samples incorporating this I-131 standard, prepared using the suspect resin, were analyzed, yielding the same results as observed with the USEPA milk and water studies. All of these results showed percent recoveries that were 76% to 78% of the "known" values. A new batch of resin had been used for the USEPA iodine-in-water study of 8/17/92; the results of those analyses were all within the control limits of the study. The 1992 surface water samples analyzed for I-131 prior to the 8/17/92 cross-check I-131 analysis were re-evaluated using the apparent percent recovery found in the cross-check samples from February and April. Out of 28 potentially affected 1992 surface water samples, the minimum detectable I-131 activities for 4 of the samples, when recalculated, exceeded the LLD requirement for the analysis of I-131:

SAMPLE	ACHIEVED MDA for I-131	CORRECTED MDA for I-131	REQUIRED LLD for I-131
2/92, DL	<12.3 pCi/l	<15.8 pCi/l	<15 pCi/l
4/92, SWU	<12.9 pCi/l	<16.5 pCi/l	<15 pCi/l
4/92, DW	<11.9 pCi/l	<15.3 pCi/l	<15 pCi/l
5/92, DL	<12.9 pCi/l	<19.0 pCi/l	<15 pCi/l

The results of the USEPA gross beta-in-water study of 9/18/92 were above the control limits. Three samples were prepared with the recommended volume of 250 mls each. Due to the high results of one sample, a fourth sample was prepared using the remaining volume of 54 mls. The salt density (mg/cm³) of the three original samples was too high, but was not recognized when the analysis worksheets were reviewed. The salt density of the fourth sample was low due to the small amount of volume used, and its result was within the control limits. The results of the four samples were averaged to produce a final result which was still above the control limits. The procedure for gross beta sample preparation was changed to note the limitation of sample salt density.

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.

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River Bend Station
West Feliciana Parish, Louisiana

Docket Number: 50-458
Reporting Period: 1/1/92 -12/31/92

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		Control Locations Mean (f) ² Range	Number of Nonroutine Reported Results
				Name Dist./Dir.	Mean (f) ² Range		
Air Particulate (pCi/m ³)	Gross Beta (468)	0.01	0.021 (311/312) 0.005 - 0.048	AB1 0.5 km NNE	0.021 (52/52) 0.005 - 0.048	0.021 (156/156) 0.002 - 0.046	0
	Be-7 ³ (468)	NONE REQUIRED	0.110 (264/312) 0.043 - 0.220	AHS 40 km SSE	0.124 (43/52) 0.052 - 0.225	0.114 (134/156) 0.052 - 0.225	0
	K-40 ³ (468)	NONE REQUIRED	0.584 (305/312) 0.277 - 1.870	AA1 1.7 km N	0.643 (50/52) 0.315 - 1.870	0.580 (152/156) 0.222 - 0.380	0
	Cs-134 (468)	0.05	ALL <LLD			ALL <LLD	0
	Cs-137 (468)	0.06	0.011 (9/312) 0.008 - 0.016	AHS 40 km SSE	0.018 (4/52) 0.007 - 0.042	0.013 (9/52) 0.007 - 0.042	0
Air Radioiodine (pCi/m ³)	I-131 (468)	0.07	ALL <LLD			ALL <LLD	0
Direct (TLD) ⁴ (mR Total)	Gamma Monthly (528)		4.10 (453/456) 2.53 - 5.27	TM2 4.2 km WSW	4.74 (12/12) 4.08 - 5.27	4.19 (71/72) 3.20 - 4.98	0
	Gamma Quarterly (176)		12.4 (152/152) 8.99 - 14.8	TM2 4.2 km WSW	14.3 (4/4) 14.0 - 14.7	12.6 (23/24) 10.2 - 14.7	0
Surface Water (pCi/liter)	H-3 (12)	3000	5744 (4/5) 2517 - 9849	DL	5744 (4/4) 2517 - 9849	ALL <LLD	0
	Mn-54 (36)	15	43.9 (12/24) 10.7 - 97.0	DL	43.9 (12/12) 10.7 - 97.0	ALL <LLD	0
	Co-58 (36)	15	6.12 (12/24) 1.65 - 16.5	DL	6.12 (12/12) 1.65 - 16.5	ALL <LLD	0
	Fe-59 (36)	30	8.72 (3/24) 5.13 - 15.8	DL	8.72 (3/12) 5.13 - 15.8	ALL <LLD	0
	Co-60 (36)	15	218 (13/24) 0.80 - 773	DL	236 (12/12) 42.3 - 773	ALL <LLD	0
	Zn-65 (36)	30	10.7 (7/24) 3.19 - 27.9	DL	10.7 (7/12) 3.19 - 27.9	ALL <LLD	0
	Nb-95 (36)	15	2.37 (2/24) 1.82 - 2.91	DL	2.37 (2/12) 1.82 - 2.91	ALL <LLD	0
	Zr-95 (36)	30	2.08 (1/24) single value	DL	2.08 (1/12) single value	ALL <LLD	0
	I-131 ⁵ (36)	15	ALL <LLD			ALL <LLD	0
	Cs-134 (36)	15	ALL <LLD			ALL <LLD	0
	Cs-137 (36)	18	ALL <LLD			ALL <LLD	0

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West Feliciana Parish, Louisiana

Docket Number: 50-458
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Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ¹ (LLD)	All Indicator Stations Mean (f) ² Range	Location with Highest Annual Mean		Control Locations Mean (f) ² Range	Number of Nonroutine Reported Results
				Name Dist./Dir.	Mean (f) ² Range		
Surface Water (pCi/liter)	Ba-140 (36)	60	ALL <LLD			ALL <LLD	0
	La-140 (36)	15	ALL <LLD			ALL <LLD	0
	Gross Beta (36)	4	74.6 (24/24) 3.27 - 407	DL	144 (12/12) 45.0 - 407	5.15 (12/12) 3.51 - 8.87	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 (8)	4	3.04 (1/4) single value	WD 470 m SW	3.04 (1/4) single value	ALL <LLD	0
Drinking Water ⁶ (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

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Docket Number: 50-458
Reporting Period: 1/1/92 -12/31/92

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		Control Locations Mean (f) ² Range	Number of Nonroutine Reported Results
				Name Dist./Dir.	Mean (f) ² Range		
Drinking Water ⁶ (pCi/liter) (continued)	Fe-59 (12)	30	ALL <LLD			ALL <LLD	0
	Co-60 (12)	15	ALL <LLD			ALL <LLD	0
	Zn-65 (12)	30	ALL <LLD			ALL <LLD	0
	Nb-95 (12)	15	ALL <LLD			ALL <LLD	0
	Zr-95 (12)	30	ALL <LLD			ALL <LLD	0
	I-131 (12)	15	ALL <LLD			ALL <LLD	0
	Cs-134 (12)	15	ALL <LLD			ALL <LLD	0
	Cs-137 (12)	18	ALL <LLD			ALL <LLD	0
	Ba-140 (12)	60	ALL <LLD			ALL <LLD	0
	Ia-140 (12)	15	ALL <LLD			ALL <LLD	0
	Gross Beta (12)	4	5.01 (12/12) 3.58 - 10.4	Baton Rouge 53.9 km downstream	5.01 (12/12) 3.58 - 10.4	5.15 (12/12) 3.51 - 8.87	0
Shoreline ⁷ Sediment (pCi/kg dry)	Be-7 ³ (4)	NONE REQUIRED	none measured	SEDU 4 km upstream	185 (1/2) single value	185 (1/2) single value	N/A
	K-40 ³ (4)	NONE REQUIRED	17750 (2/2) 17020 - 18480	SEDD 4 km downstream	17750 (2/2) 17020 - 18480	7415 (2/2) 7080 - 7749	N/A
	Cs-134 (4)	150	ALL <LLD			ALL <LLD	0
	Cs-137 (4)	180	49.1 (1/2) single value	SEDD 4 km downstream	49.1 (1/2) (single value)	21.8 (2/2) 15.3 - 28.3	0
Fish/ Invertebrates (pCi/kg wet)	K-40 ³ (12)	NONE REQUIRED	2667 (6/6) 2161 - 3421	FU 4 km upstream	2674 (6/6) 2081 - 3553	2674 (6/6) 2081 - 3553	0
	Mn-54 (12)	130	ALL <LLD			ALL <LLD	0
	Co-58 (12)	130	ALL <LLD			ALL <LLD	0
	Fe-59 (12)	260	ALL <LLD			ALL <LLD	0

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Reporting Period: 1/1/92 -12/31/92

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		Control Locations Mean (f) ² Range	Number of Nonroutine Reported Results
				Name Dist./Dir.	Mean (f) ² Range		
Fish/ Invertebrates (pCi/kg wet) (continued)	Co-60 (12)	130	ALL <LLD			ALL <LLD	0
	Zn-65 (12)	260	ALL <LLD			ALL <LLD	0
	Cs-134 (12)	130	ALL <LLD			ALL <LLD	0
	Cs-137 (12)	160	ALL <LLD			ALL <LLD	0
Broadleaf Vegetation (pCi/kg wet)	Be-7 ³ (105)	NONE REQUIRED	346 (55/72) 73 - 828	GQC 35 km NW	574 (29/36) 78 - 1992	574 (29/36) 78 - 1992	N/A
	K-40 ³ (105)	NONE REQUIRED	3006 (66/72) 1258 - 4942	GQC 35 km NW	3871 (34/36) 1971 - 6411	3871 (34/36) 1971 - 6411	N/A
	I-131 (105)	60	ALL <LLD			ALL <LLD	0
	Cs-134 (105)	60	ALL <LLD			ALL <LLD	0
	Cs-137 (105)	80	ALL <LLD			ALL <LLD	0

NOTES:

1. Lower Limit of Detection (LLD) as defined in RBS Technical Specifications (NUREG-1172).
2. Mean and range based on detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (f).
3. 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.
4. Monthly gamma exposure estimates are "normalized" to a 30-day month and quarterly gamma exposure estimates are "normalized" to a 90-day quarter.
5. Minimum detectable activities achieved for I-131 for 4 surface water samples when corrected for recovery efficiency of inferior ion exchange resin exceeded the required LLD. (See discussion in program exceptions.)
6. The upstream surface water sampling location (SWU) is used as a "control" for drinking water comparisons.
7. An upstream sediment sampling location, though not required, is used as a "control" for shoreline sediment comparisons. Cesium-137 was detected at both locations, presumably as a consequence of runoff from areas affected by fallout from the accident at Chernobyl, Russia, in 1986.

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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. Noble gases (Kr-87, Xe-133, Xe-135) were detected in air samples throughout the year. Cs-137 was measured in charcoal cartridges 9 times at indicator, and 9 times at control locations, presumably traces of Chernobyl fallout. Gross beta activities averaged 0.021 pCi/m³ at indicator locations and 0.021 pCi/m³ at control locations.

3.1.2 Direct Exposure Pathway - The monthly average gamma ray exposures for indicator and control locations were 4.10 and 4.19 millirem (mR) total, respectively. Quarterly exposures averaged 12.4 mR total at indicator locations and 12.6 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, Cr-51, Zn-65, Nb-95, and Zr-95 were measured in a few monthly composite samples from the CWS discharge line at concentrations between 1.65 and 773 picocuries per liter. Gross beta activities in surface water averaged 144 pCi/l in the discharge line and from 3 to 10 pCi/l at all other stations. Tritium (H-3) activities in surface water averaged 5594 pCi/l in the discharge line and were below detection limits at all other locations. Gross beta activities averaged 3.0 pCi/l in the downgradient WD (indicator), and below LLD in upgradient WU (control) groundwater. Besides naturally-occurring gamma emitters, Cs-137 was measured in Mississippi River shoreline up-stream sediment at 21.8 pCi/kg dry; down-stream at 49.1 pCi/kg dry. As in the case of the airborne Cs-137 activity, this slightly elevated level (relative to baseline conditions) is probably attributable to the 1986 incident at Chernobyl, Russia.

3.1.4 Ingestion Exposure Pathway - Specific activities for radioiodine were below the required LLD in the ingestion pathway monitoring media during 1992. Only naturally-occurring gamma emitters was measured in broadleaf vegetation and fish in 1992.

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 1992. Gross beta activities on air particulate filters averaged 0.021 pCi/m³ at indicator and 0.021 pCi/m³ at control locations in 1992, compared to 0.03 pCi/m³ at both indicator and control locations during the preoperational phase of the REMP (Appendix B).

In the direct exposure pathway, the 1992 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 differences have been observed in TLD exposures between indicator and control locations or between the same locations from one year to the next.

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In the waterborne exposure pathway, average activities analyzed for required gamma-emitting nuclides were measured below the RBS Technical Specification LLDs during 1992 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	1988	1989	1990	1991	1992
Surface Water, Upstream (4 km)	7.80	9.30	7.79	9.75	4.55	5.15
RBS Discharge Line	N/A	32.38	32.05	40.39	33.90	143.55
Surface Water, Downstream (4 km)	8.10	8.66	7.41	9.52	5.23	5.59
Drinking Water (Baton Rouge)	6.80	6.24	8.23	9.47	5.05	5.01
Upgradient Groundwater	6.00	2.45	3.61	6.03	<2.91	<3.02
Downgradient Groundwater	4.00	2.20	3.44	4.73	3.17	3.04

WATERBORNE AVERAGE TRITIUM (pCi/l)

	Pre- operational	1988	1989	1990	1991	1992
Surface Water, Upstream (4 km)	<3000	<588	<554	<209	<371	<355
RBS Discharge Line	N/A	2272	3469	20452	7047	5744
Surface Water, Downstream (4 km)	<3000	<592	<554	<209	<374	<364
Drinking Water (Baton Rouge)	<3000	<586	<557	<210	186	<360
Upgradient Groundwater	<3000	<780	<561	<211	<366	<352
Downgradient Groundwater	<3000	<779	<572	<207	<363	<348

Gross beta activities in the discharge line samples averaged higher in 1992 due to the decontamination activities during the fuel outage. As observed in previous years, the annual average gross beta activity for the control location (SWU) averaged the same as that for the indicator location (SWD). The gross beta activity levels in the discharge line sample (DL) seemingly reflect the normal cycles of concentration at which the station cooling towers are operated.

Tritium activities in the discharge line decreased on average from 1991, reflecting the releases already noted in the 1992 Semiannual Radioactive Effluent Release Reports (see also Table 6). These reduced tritium levels reflect a decrease from 1990 due to removal of failed fuel, but represent an increase compared to years prior to 1990, due to more efficient radioactive wastewater treatment and reuse (e.g., boiler makeup). In the RBS boiler-reactor, tritium is produced by ternary fission of the reactor fuel (U-235), 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 particulates (metals and salts) are removed in this treatment leaving the tritium behind as water (e.g., [$^3\text{H}-\text{O}-\text{H}$]). When this water is reused as boiler makeup, the tritium concentration in the water increases.

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In the ingestion exposure pathway, no gamma emitting nuclides were measured above LLDs during 1992, and there appear to have been no increases in radionuclide concentrations attributable to RBS operation in food/forage media over baseline levels (Appendix B). Naturally-occurring K-40 was measured at an average of 3006 pCi/kg in indicator vegetation and at an average of 3871 pCi/kg in control vegetation in 1992, roughly the same levels encountered prior to RBS operation (refer to Appendix B). Another natural nuclide, Be-7, averaged 346 and 574 pCi/kg in indicator and control vegetation samples, respectively, during 1992. 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 1992 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 1992. The 1992 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 1992. 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.

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TABLE 6

SUMMARY COMPARISON OF LIQUID EFFLUENT QUANTITIES/ACTIVITIES^a
AND AEMP DISCHARGE LINE MONITORING RESULTS

Quantities Released	1st Qtr. 1992	2nd Qtr. 1992	3rd Qtr. 1992	4th Qtr. 1992	Total 1992
Liters, effl.	7.54E+06	9.56E+06	1.19E+07	5.99E+06	3.50E+07
Liters, dil.	1.12E+09	8.05E+08	1.19E+09	9.74E+08	4.09E+09
H-3, Curies	6.38E+00	9.61E+00	4.26E+00	3.12E+00	2.34E+01
Cr-51, Curies	7.66E-02	1.84E-02	3.58E-03	3.28E-02	1.31E-01
Mn-54, Curies	4.38E-02	1.65E-02	9.29E-02	4.25E-02	1.96E-01
Co-58, Curies	9.20E-03	3.17E-03	1.17E-02	3.38E-03	2.75E-02
Fe-59, Curies	9.33E-03	1.39E-03	1.68E-03	1.14E-03	1.35E-02
Co-60, Curies	1.17E-01	8.85E-02	6.12E-01	1.74E-01	9.92E-01
Nb-95, Curies	1.32E-03	4.01E-04	1.14E-03	4.49E-04	3.31E-03
Zr-95, Curies	7.06E-04	2.83E-05	5.33E-05	5.24E-04	1.31E-03
Zn-65, Curies	4.41E-03	3.75E-03	2.09E-02	4.96E-03	3.40E-02

Measured Nuclide	Predicted (Extrapolated) Specific Activities (pCi/l)					1992 REMP Mean (Range) pCi/l
	1st Qtr. 1992	2nd Qtr. 1992	3rd Qtr. 1992	4th Qtr. 1992	Mean 1992	
H-3	5658	11798	3544	3184	6046	5594 (1662-12185) ^b 5744 (2517-9849) ^c
Cr-51	67.9	22.6	2.98	33.5	31.7	47.9 (13.3-103)
Mn-54	38.8	20.3	77.3	43.4	44.9	43.9 (10.7-97.0)
Co-58	8.16	3.89	9.73	3.45	6.31	6.12 (1.65-16.5)
Fe-59	8.27	1.71	1.40	1.16	3.14	8.72 (5.13-15.8)
Co-60	104	109	509	178	225	236 (42.3-773)
Nb-95	1.17	0.49	0.95	0.46	0.77	10.7 (3.19-27.9)
Zn-65	3.91	4.60	17.4	5.06	7.74	2.08 (single value)
Zr-95	0.63	0.03	0.04	0.53	0.31	2.37 (1.82-2.91)

NOTES:

- ^a Effluent quantities and nuclide activities excerpted from the two 1992 Semiannual Radioactive Effluent Release Reports already submitted.
- ^b Results from monthly composites.
- ^c Results from quarterly composites.

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APPENDIX A

Listings of 1992 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 1992. Concentrations 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.

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Air Particulate Filter Gross Beta Activity (E-2 pCi/m³) - 1992

WEEK ENDING	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/07/92	3.96	4.84	1.39	3.41	4.66	3.35	3.26	4.13	3.18
01/14/92	2.97	3.49	3.03	2.83	3.26	2.45	2.79	3.24	2.60
01/20/92	1.78	1.64	2.25	1.90	2.15	1.63	2.02	2.19	1.49
01/27/92	2.67	2.37	2.80	2.30	2.92	1.74	2.36	2.96	1.96
02/03/92	2.49	2.68	3.06	2.45	3.25	3.03	2.73	2.95	2.13
02/11/92	1.92	2.05	2.34	2.04	2.59	2.22	2.03	2.34	1.42
02/18/92	1.82	1.82	2.44	1.88	2.13	1.87	1.64	2.04	1.23
02/24/92	1.77	1.86	2.17	1.84	2.09	2.24	1.75	2.20	1.34
03/02/92	1.80	1.58	1.99	1.58	1.93	1.66	1.73	1.91	1.18
03/10/92	1.60	1.12	1.81	1.63	1.65	1.68	1.35	1.78	1.15
03/17/92	1.73	1.91	2.23	1.69	2.35	2.19	2.03	2.42	1.46
03/23/92	1.92	1.78	2.23	2.19	2.24	2.00	1.82	2.39	1.50
03/30/92	2.24	2.03	2.25	2.35	2.41	2.52	2.02	2.38	1.28
04/06/92	1.82	2.03	2.16	2.19	2.52	1.57	2.11	2.15	1.52
04/13/92	1.64	1.62	2.02	1.84	2.20	1.14	1.91	1.87	1.14
04/22/92	1.00	1.09	1.56	1.44	1.51	0.86	1.77	1.78	1.57
04/27/92	1.48	2.13	1.84	1.82	2.06	1.75	1.98	2.21	1.83
05/04/92	1.33	2.54	2.24	1.33	2.45	1.81	2.35	2.28	2.37
05/11/92	1.87	2.77	2.37	2.24	1.00	1.80	2.45	2.23	2.42
05/19/92	1.86	2.65	2.50	2.56	2.60	1.76	1.05	2.58	2.37
05/26/92	1.40	2.19	1.95		2.11	1.82	1.35	2.07	2.10
06/01/92	1.35	1.91	1.72	1.59	2.00	1.50	1.14	1.95	1.78
06/09/92	1.40	1.91	1.84	1.79	1.85	1.53	0.15	1.93	1.76
06/15/92	1.08	1.54	1.24	1.28	1.46	1.11	1.17	1.43	1.28
06/22/92	1.32	1.87	1.71	1.31	1.87	1.43	1.70	1.68	1.66
06/29/92	2.36	3.02	2.54	2.15	2.93	2.15	2.23	2.89	2.66
07/06/92	1.86	2.11	1.85	2.37	2.53	1.97	2.54	2.52	2.33
07/13/92	2.64	2.92	2.11	3.19	3.64	2.89	3.85	3.59	3.43
07/20/92	1.25	1.30	1.18	1.41	1.70	1.47	1.42	1.42	1.54
07/27/92	0.82	0.79	0.53	0.87	1.16	0.84	1.18	1.00	0.94
08/04/92	1.24	1.42	1.25	1.57	1.91	1.49	1.78	1.71	1.71
08/10/92	1.31	1.34	1.42	1.45	1.83	1.30	1.51	1.71	1.41
08/17/92	1.57	1.83	1.55	2.19	2.06	1.43	2.20	1.85	2.08
08/24/92	2.69	2.77	2.73	3.31	3.56	2.72	3.48	2.97	3.17
09/01/92	1.56	1.45	1.50	2.23	2.34	1.92	4.61	1.42	2.06
09/08/92	0.95	1.14	1.19	1.22	1.30	0.91	1.20	1.35	1.31
09/14/92	1.70	1.83	1.93	2.26	2.71	2.02	2.32	2.11	2.28
09/22/92	1.03	0.84	1.07	1.31	1.37	0.99	1.33	1.42	1.32
09/28/92	2.46	1.42	1.71	2.15	2.02	2.16	2.35	1.90	2.24
10/05/92	2.82	1.93	2.05	2.38	2.11	2.41	2.61	2.65	2.67
10/12/92	3.97	2.85	2.84	3.10	2.95	3.57	2.76	3.03	3.10
10/19/92	3.22	2.43	3.06	2.96	2.98	3.38	2.65	3.27	3.20
10/26/92	4.27	3.92	3.42	3.96	4.19	4.23	3.35	3.89	4.08
11/02/92	3.54	3.22	3.51	3.94	3.31	3.92	2.64	3.59	3.67
11/09/92	1.92	1.93	2.10	2.33	0.72	2.37	1.91	2.25	2.11
11/17/92	2.40	2.11	2.30	2.53	2.10	2.72	1.99	2.60	2.49
11/23/92	1.28	1.20	1.46	1.63	1.38	1.37	1.11	1.56	1.45
12/01/92	2.44	2.35	2.11	2.90	2.07	2.92	2.28	2.46	2.42
12/08/92	1.44	2.18	2.44	2.45	2.16	2.50	2.12	2.25	2.23
12/14/92	2.42	2.00	2.33	2.51	1.90	2.25	1.95	2.50	2.41
12/21/92	2.58	1.66	2.34	2.51	2.15	2.65	1.98	2.11	2.48
12/30/92	2.24	2.18	2.07	2.36	1.06	2.32	1.99	2.15	2.26

Note: Activities shown are values actually measured

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Air Particulate Filter Beryllium-7 Activity (E-2 pCi/m³) by Location - 1992

WEEK ENDING	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/07/92	8.24	8.76		9.19	11.40	7.72		11.90	7.82
01/14/92		13.70	8.62	13.10	9.46				
01/20/92	13.80	11.20	11.00	9.94	11.20			16.30	8.34
01/27/92	7.86		15.50	13.50	10.50	8.86	10.30	10.90	
02/03/92	10.20	8.49	11.20	12.40	10.00	12.40			9.47
02/11/92	13.90	11.40	12.40	15.80	17.50	20.20	15.60	16.00	8.37
02/18/92	12.70			17.40	14.70	12.10	10.60	16.90	10.70
02/24/92	14.30	11.90	7.62	14.40	11.00	9.04	13.30		
03/02/92	15.40	7.11	11.00		8.08	8.69	7.35		8.36
03/10/92	14.70	13.50	13.50	16.60	15.10	14.60	8.56	13.30	8.26
03/17/92	17.00	11.50	12.80	13.60	14.30	11.10	8.97	18.30	13.90
03/24/92	12.70		14.20	14.90	15.80	16.90	15.20	14.20	12.60
03/30/92	13.70		15.70	14.90	16.70	15.10	13.60	15.80	9.77
04/06/92	13.10	18.30	18.00	22.00	19.00	15.50	18.70	22.50	18.20
04/13/92	11.00	15.20	14.20	13.40	17.60	7.44	9.70	19.20	
04/22/92		9.71	12.80	14.50	20.40		15.20	9.58	12.30
04/27/92		12.70	22.10	14.40	13.20		19.30	13.80	14.40
05/04/92	10.30	15.70	19.70	14.40	13.00	16.20	20.80	16.50	17.00
05/11/92	6.77	16.90	14.80	14.20		14.30	16.50	13.80	17.50
05/19/92	9.20	7.91	11.70	13.50	15.30	7.10	6.09	15.30	11.50
05/26/92	5.61	14.30	15.70		11.30	10.30	6.43	9.64	9.58
06/01/92	6.94	13.50	9.37	7.75	6.66		7.28		
06/09/92		8.07	8.57	5.96	8.11		5.32	8.49	
06/15/92			11.30			9.97	8.07	6.26	6.53
06/22/92		14.00	8.96	5.26	8.57	8.63	6.88	7.46	11.40
06/29/92	11.40	14.50	14.60	9.97	10.90	18.00	11.60	15.60	11.10
07/06/92	9.52		9.75	10.10	10.40		8.18	8.91	11.10
07/13/92	9.40	8.55	7.83	13.80	14.20	13.90	13.60	15.30	15.80
07/20/92		9.29	8.22	11.60		8.29	10.10	7.70	6.54
07/27/92	6.10		5.76				7.75		
08/04/92		5.68	10.70	12.60	9.68	6.54	5.93	6.76	10.90
08/10/92	8.72		11.70	9.79	8.00	7.09	11.70		12.20
08/17/92	6.82		9.40	9.94		8.74	10.50	12.70	12.30
08/24/92	8.35	7.19	12.70	13.10	11.90	12.40	10.50	11.80	11.90
09/01/92				12.30	12.30		13.50	10.10	9.99
09/08/92	9.88	9.58	9.44	10.00	15.00	7.49	12.30	7.15	8.58
09/14/92	10.70	6.28	8.80	13.80	8.72	9.98	13.70		14.10
09/22/92	5.74	7.03	6.97	7.64	7.72	8.81	13.30	8.28	11.60
09/28/92	8.93	7.64	9.66	7.28	9.21		8.44		9.76
10/05/92	10.60	16.30	9.84	10.90	11.50	12.90	19.80	15.10	13.10
10/12/92	11.90	9.28	13.40	16.50	11.90	17.60	10.50	15.30	10.60
10/19/92	15.30	11.60	13.70	8.69	14.00	18.00	8.55	15.80	18.00
10/26/92	10.10	19.30	12.30	13.60	16.40	17.30	13.40	20.20	14.30
11/02/92	12.70	8.70	8.81	9.36	11.30	11.10	7.29	13.60	10.30
11/09/92	6.17		7.13	9.42		10.00	7.82	7.55	6.87
11/17/92	11.10	10.00	6.74	11.10		9.33	7.96	12.00	8.39
11/23/92	6.07	10.90	10.60	9.18	11.00	9.12	7.38	16.10	9.01
12/01/92	4.87		5.66	5.97	5.82	5.67	6.52	8.52	7.39
12/08/92		9.26	9.98	9.20	8.48	9.17	6.87	9.12	9.13
12/14/92	6.96				11.90	5.41	5.20	8.31	7.24
12/21/92		4.84	6.62	8.92	7.20	6.47		6.42	10.30
12/30/92	5.53	9.68	4.91		4.29	8.22		5.16	6.17

NOTE: Activities shown are values actually measured

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Air Particulate Filter Cesium-134 Activity (10^{-2} dpm/m³) by Location - 1992

WEEK ENDING	INDICATOR LOCATION						CONTROL LOCATION		
	AA1	AB1	AR1	AKS	AP	AQS2	ALC	AHS	AGS
01/07/92	<1.83	<1.98	<1.61	<1.72	<1.58	<1.67	<1.54	<1.93	<1.72
01/14/92	<2.47	<2.60	<1.77	<2.03	<1.74	<1.70	<1.94	<2.28	<1.93
01/20/92	<2.11	<2.53	<2.25	<2.19	<2.15	<2.08	<2.21	<2.61	<2.56
01/27/92	<1.80	<2.08	<1.77	<1.50	<1.91	<1.28	<1.88	<1.57	<1.84
02/03/92	<1.60	<2.20	<1.62	<1.91	<2.34	<2.14	<1.78	<2.26	<1.62
02/11/92	<1.56	<1.82	<1.70	<1.74	<1.68	<1.58	<1.50	<1.70	<1.70
02/18/92	<2.03	<1.99	<1.89	<1.86	<2.09	<1.88	<1.80	<1.75	<1.82
02/24/92	<1.98	<2.18	<2.11	<2.18	<2.39	<1.89	<2.19	<1.88	<2.53
03/02/92	<1.99	<2.00	<1.75	<1.90	<1.82	<1.98	<1.69	<2.07	<2.10
03/10/92	<1.78	<1.88	<1.46	<1.65	<1.77	<1.64	<1.72	<1.46	<1.85
03/17/92	<2.02	<2.13	<1.60	<2.07	<2.00	<2.01	<1.61	<2.09	<1.69
03/24/92	<2.01	<2.20	<2.12	<2.29	<1.69	<1.71	<1.82	<2.26	<2.29
03/30/92	<2.64	<1.86	<1.78	<1.64	<2.48	<1.72	<1.87	<2.13	<1.88
04/06/92	<1.89	<1.81	<1.81	<1.86	<2.01	<1.97	<1.48	<1.86	<1.99
04/13/92	<2.24	<2.20	<1.80	<2.10	<2.05	<1.67	<1.55	<1.88	<2.04
04/22/92	<1.47	<1.75	<1.56	<1.26	<1.61	<1.17	<1.58	<1.61	<1.48
04/27/92	<2.63	<3.01	<2.50	<2.52	<2.59	<2.41	<2.51	<2.77	<2.27
05/04/92	<1.98	<2.32	<2.43	<1.70	<1.66	<2.02	<1.65	<1.84	<1.63
05/11/92	<1.53	<1.85	<1.34	<1.37	<1.51	<1.45	<1.39	<1.42	<1.19
05/19/92	<1.33	<1.43	<1.26	<1.36	<1.47	<1.40	<1.14	<1.22	<1.22
05/26/92	<1.49	<2.04	<1.45		<1.58	<1.53	<1.38	<1.42	<1.33
06/01/92	<1.79	<2.40	<1.84	<1.49	<1.99	<1.91	<1.60	<1.93	<1.41
06/09/92	<1.09	<1.53	<1.24	<1.32	<1.45	<1.35	<1.29	<1.36	<1.00
06/15/92	<1.65	<1.90	<1.76	<1.58	<2.11	<1.58	<1.20	<1.77	<1.75
06/22/92	<4.35	<1.78	<1.41	<1.19	<1.80	<1.39	<1.28	<1.65	<1.52
06/29/92	<1.66	<1.79	<1.30	<1.15	<1.60	<1.53	<1.38	<1.46	<1.29
07/06/92	<1.49	<1.33	<1.12	<1.41	<1.58	<1.44	<1.33	<1.59	<1.41
07/13/92	<1.43	<1.32	<1.19	<1.50	<1.77	<1.45	<1.66	<1.46	<1.35
07/20/92	<1.43	<1.30	<1.20	<1.23	<1.54	<1.56	<1.24	<1.28	<1.19
07/27/92	<1.60	<1.32	<1.34	<1.20	<1.90	<1.43	<1.31	<1.65	<1.07
08/04/92	<1.30	<1.22	<1.22	<1.12	<1.52	<1.40	<1.29	<1.24	<1.29
08/10/92	<1.80	<1.41	<1.53	<1.36	<2.15	<1.91	<1.43	<1.72	<1.61
08/17/92	<1.38	<1.24	<1.18	<1.32	<1.59	<1.53	<1.28	<1.53	<1.26
08/24/92	<1.20	<1.32	<1.19	<1.22	<1.83	<1.68	<1.35	<1.43	<1.52
09/01/92	<2.94	<2.49	<2.27	<2.44	<3.22	<1.45	<2.38	<3.11	<1.14
09/08/92	<1.47	<1.25	<1.12	<1.30	<1.39	<1.51	<1.53	<1.36	<1.42
09/14/92	<1.74	<1.49	<1.44	<1.55	<2.10	<1.94	<1.52	<1.52	<1.59
09/22/92	<1.28	<1.10	<1.05	<1.16	<1.58	<1.31	<1.30	<1.28	<1.16
09/28/92	<1.68	<1.41	<1.29	<1.49	<1.66	<1.65	<1.56	<1.49	<1.86
10/05/92	<1.49	<1.48	<1.23	<1.49	<1.37	<1.20	<1.27	<1.42	<1.33
10/12/92	<1.26	<1.37	<1.19	<1.16	<1.34	<1.19	<1.32	<1.18	<1.18
10/19/92	<1.12	<1.04	<1.13	<1.09	<1.23	<1.24	<1.49	<1.31	<0.97
10/26/92	<1.24	<1.27	<1.12	<1.47	<1.17	<1.43	<1.16	<1.16	<1.02
11/02/92	<1.25	<1.23	<1.14	<1.30	<1.13	<1.24	<1.36	<1.25	<1.08
11/09/92	<1.07	<1.17	<1.21	<1.32	<1.16	<1.30	<1.43	<1.20	<1.09
11/17/92	<1.02	<1.05	<1.04	<1.05	<0.99	<0.97	<1.11	<1.06	<0.82
11/23/92	<1.44	<1.38	<1.42	<1.36	<1.40	<1.24	<1.67	<1.23	<1.17
12/01/92	<1.04	<1.02	<1.17	<1.15	<1.04	<0.99	<1.06	<0.99	<0.94
12/08/92	<1.18	<1.17	<1.78	<1.18	<1.10	<1.14	<1.29	<1.27	<1.02
12/14/92	<1.22	<1.38	<1.61	<1.24	<1.57	<1.91	<1.36	<1.64	<1.49
12/21/92	<1.19	<1.17	<1.38	<1.25	<1.15	<1.23	<1.19	<0.91	<1.26
12/30/92	<0.85	<0.88	<1.01	<0.90	<0.93	<0.88	<0.91	<0.69	<1.08

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.

**RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**

Air Particulate Filter Cesium-137 Activity (E-2 pCi/m³) by Location - 1992

WEEK ENDING	INDICATOR LOCATION						CONTROL LOCATION		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/07/92	<1.91	<2.15	<1.59	<1.88	<1.90	<1.67	<1.38	<2.09	<1.68
01/14/92	<2.72	<3.01	<1.99	<2.03	<1.93	<2.01	<1.87	<2.47	<2.29
01/20/92	<2.34	<2.49	<2.35	<2.12	<2.40	<2.21	<2.31	<2.56	<2.34
01/27/92	<2.05	<2.31	<1.81	<1.82	<2.11	<1.41	<2.08	<1.73	<1.73
02/03/92	<1.69	<2.22	<1.77	<2.13	<2.22	<2.22	<1.52	<1.82	<1.97
02/11/92	<1.69	<1.62	<1.59	<1.70	<2.16	<1.52	<1.53	<1.76	<1.51
02/18/92	<2.04	<1.89	<1.78	<1.93	<1.82	<1.79	<2.05	<2.02	<1.97
02/24/92	<2.26	<2.18	<2.20	<2.35	<2.50	<1.80	<2.10	<2.29	<2.32
03/02/92	<2.06	<1.93	<1.70	<2.02	<2.21	<2.06	<1.78	<2.66	<1.60
03/10/92	<1.87	<1.85	<1.59	<1.59	<1.78	<1.65	<1.75	<1.77	<1.49
03/17/92	<2.28	<2.10	<1.92	<2.11	<1.92	<2.09	<1.91	<2.48	<1.99
03/24/92	<2.15	<2.22	<2.38	<2.26	<2.00	<1.61	<1.96	<2.05	<2.57
03/30/92	<2.78	<1.93	<2.10	<1.68	<2.22	<1.86	<1.37	<1.85	<1.68
04/06/92	<2.25	<1.60	<1.83	<1.73	<2.00	<1.63	<1.66	<1.99	<2.05
04/13/92	<2.32	<2.19	<1.77	<2.37	<2.25	<2.04	<1.72	<1.84	<1.52
04/22/92	<1.92	<1.90	<1.35	<1.31	<1.86	<1.28	<1.65	<1.36	<1.24
04/27/92	<2.92	<2.98	<2.66	<2.93	<2.85	<3.30	<2.69	<2.69	<2.76
05/04/92	<2.07	<2.20	<2.55	<1.99	<2.13	<2.09	<1.70	<2.10	<1.87
05/11/92	<1.59	<1.62	<1.38	<1.28	<1.00	<1.63	<1.25	<1.20	<1.39
05/19/92	<1.28	<1.47	<1.05	<1.52	<1.37	<1.36	<1.28	<1.22	<1.27
05/26/92	<1.74	<1.85	<1.50		<1.72	<1.47	<1.53	<1.44	<1.45
06/01/92	<1.98	<2.18	<1.78	<1.49	<1.74	<1.88	<1.61	<1.83	<1.66
06/09/92	<1.38	<1.47	<1.16	<1.31	<1.47	<1.28	<1.15	<1.47	<1.18
06/15/92	<1.85	<1.90	<1.68	<1.59	<1.84	<1.65	<1.83	<1.68	<1.91
06/22/92	<4.01	<1.81	<1.25	<1.26	<1.82	<1.46	<1.77	<1.68	<1.48
06/29/92	<1.65	<1.93	<1.43	<1.29	<1.83	<1.54	<1.50	<1.35	<1.26
07/06/92	<1.56	<1.31	<1.19	<1.57	<1.68	<1.39	<1.45	<1.42	<1.49
07/13/92	<1.57	<1.53	<1.09	<1.68	<1.71	<1.79	<1.67	<1.34	<1.45
07/20/92	<1.54	<1.38	<1.39	<1.45	<1.61	<1.62	<1.48	<1.60	<1.22
07/27/92	<1.55	<1.36	<1.20	<1.38	<1.89	<1.39	<1.33	<1.30	<1.31
08/04/92	<1.36	<1.23	<1.17	<1.28	<1.84	<1.25	<1.31	<1.33	<1.23
08/10/92	<1.96	<1.33	<1.53	<1.47	<1.63	<1.86	<1.32	<1.64	<1.57
08/17/92	<1.71	<1.31	<1.29	<1.45	<1.66	<1.45	<1.37	<1.53	<1.44
08/24/92	<1.77	<1.40	<1.31	<1.50	<1.66	<1.67	<1.45	<1.45	<1.53
09/01/92	<2.85	<1.46	<2.70	<3.22	<3.24	<1.55	<2.36	<3.06	<1.39
09/08/92	<1.41	<1.15	<1.24	<1.49	<1.52	<1.59	<1.50	<1.48	<1.36
09/14/92	<1.78	<1.64	<1.34	<1.62	<1.97	<1.82	<1.53	<1.52	<1.55
09/22/92	<1.42	<1.19	<1.16	<1.12	<1.59	<1.47	<1.47	<1.22	<1.24
09/28/92	<1.33	<1.44	<1.27	<1.80	<1.72	<1.63	<1.72	<1.79	<1.90
10/05/92	<1.71	<1.54	<1.34	<1.50	<1.25	<1.39	<1.38	<1.50	<1.43
10/12/92	<1.29	<1.52	<1.24	<1.37	<1.20	<1.29	<1.37	<1.39	<1.17
10/19/92	<1.73	<1.45	<1.08	<1.31	<1.29	<1.09	<1.42	<1.45	<1.18
10/26/92	<1.31	<1.41	<1.14	<1.53	<1.25	<1.27	<1.30	<1.30	<1.00
11/02/92	<1.23	<1.24	<1.04	<1.30	<1.26	<1.19	<1.30	<1.33	<1.15
11/09/92	<1.15	<1.33	<1.42	<1.27	<1.16	<1.39	<1.38	<1.39	<1.12
11/17/92	<1.20	<1.10	<1.06	<1.22	<1.16	<1.05	<1.75	<1.10	<0.95
11/23/92	<1.41	<1.53	<1.49	<1.36	<1.40	<1.29	<1.47	<1.48	<1.37
12/01/92	<1.23	<1.09	<1.05	<1.27	<1.18	<0.92	<0.99	<1.24	<0.96
12/08/92	<1.13	<1.07	<1.55	<1.26	<1.18	<1.19	<1.24	<1.38	<1.05
12/14/92	<1.44	<1.49	<1.68	<1.54	<1.64	<1.37	<1.48	<1.77	<1.41
12/21/92	<1.18	<1.21	<1.28	<1.39	<1.39	<1.14	<1.47	<1.04	<1.32
12/30/92	<0.89	<0.96	<0.85	<0.90	<0.99	<0.96	<0.89	<0.87	<1.05

NOTE: Activities indicated are minimum detectable 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.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Charcoal Cartridge Potassium-40 Activity (E-2 pCi/m³) by Location - 1992

WEEK ENDING	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/07/92	76.50	58.60	57.80	73.90	48.40	47.60	53.30	46.20	60.10
01/14/92	75.50	84.70	76.00	78.10	64.80	49.70	53.20	113.00	64.80
01/20/92	105.00	73.50	103.00	78.00	52.70	75.10	86.10	93.50	84.20
01/27/92	81.60	65.20	42.10	44.60	73.90	43.50	73.20	71.80	111.00
02/03/92	95.70	67.70	64.70		57.50	66.60	74.50	89.50	70.60
02/11/92	74.90	83.60	52.00	58.50	69.90	60.50	53.90	64.70	61.00
02/18/92	75.30	69.10	80.80	64.20	56.10	67.20	117.00	76.10	62.00
02/24/92	77.90	64.60	58.30	89.10	103.00	80.70	62.70	63.00	64.30
03/02/92	61.10	61.40	53.00	62.30	53.00	59.20	50.10	62.30	68.90
03/10/92	63.00	67.90	56.90	64.00	49.10	41.10	49.90	43.60	52.40
03/17/92	74.80	51.10	68.70	53.10	64.40	59.30	47.5	54.50	70.00
03/24/92	48.00	58.90	69.60	59.50	45.40	53.40	55.60	63.60	65.00
03/30/92	76.80	51.10	43.90	55.50	69.00	77.60	54.50	69.20	53.00
04/06/92		39.60	52.00	53.80	55.40	70.50	53.70	28.70	45.90
04/13/92	56.50	59.10	55.10	56.30	53.10	70.70	64.00	82.30	53.30
04/22/92	58.00	50.00	48.60	45.20	43.80	42.50	39.10	42.90	37.90
04/27/92	90.40	110.00	70.90	67.60	108.00	71.90	102.00	108.00	89.70
05/04/92	55.50	50.90	56.10	50.10	58.80	86.10	58.60	55.10	62.00
05/11/92	63.70	64.00	53.80	48.70	62.50	55.70	46.70	53.70	58.30
05/19/92	48.90	54.10	46.60	52.60	65.00	47.30	88.90	61.40	52.60
05/26/92	85.90	84.20	48.50		53.40	58.30	66.80	57.10	47.10
06/01/92	91.10	60.90	53.10	41.80	95.80	48.60	53.90	74.60	47.50
06/09/92	53.70	59.40	38.40	53.20	38.00	37.30	54.50	42.30	45.30
06/15/92	69.60	108.00	73.10	83.00	67.60	54.70	84.60	55.80	80.40
06/22/92	187.00	53.60	41.50	74.60	55.10	53.10	54.80	51.10	42.60
06/29/92	65.70	74.80	48.80	33.00	63.40	41.10	62.20	57.50	57.80
07/06/92	46.00	45.90	38.80	83.50	60.20	48.70	57.50	59.70	46.80
07/13/92	35.80	45.00	40.90	49.90	63.60	42.60	58.80	50.20	55.20
07/20/92	67.10	54.20	61.50	52.80	71.50	61.70	54.90	36.80	52.10
07/27/92	31.80	48.30	54.60	40.90	57.10	54.30	52.60	44.50	54.50
08/04/92	44.20	35.30	60.60	35.40	77.00	57.50	47.60	49.00	40.40
08/10/92	60.70	30.70	53.90	51.00	77.70	72.40	69.50	60.90	50.40
08/17/92	65.10	43.60	48.20	57.90	69.70	61.40	65.20	50.30	47.50
08/24/92	74.40		36.00	49.20	60.80	63.80	56.70	74.80	42.30
09/01/92	102.00	88.20	87.10	119.00	109.00		186.00		63.10
09/08/92	71.50	57.90	49.40	56.80	47.70	57.40	73.10	59.90	52.60
09/14/92	59.30	61.40	55.80	56.00	102.00	81.90	45.00	53.20	41.80
09/22/92		31.40		52.80	39.90	38.20	38.00	37.90	
09/28/92	58.70	50.90	50.10	55.60	58.30	68.40	67.80		41.10
10/05/92	60.00	43.10	53.20	70.70	51.50	63.50	56.60	35.40	71.70
10/12/92	42.70	53.40	44.20	65.20	46.80	27.70	51.40	53.80	37.90
10/19/92	46.40	30.80	39.70	47.60	43.60	44.50	43.80	38.10	50.40
10/26/92	56.20	32.80	30.40	59.60	58.10	52.70	40.10	44.50	40.70
11/02/92	50.10	51.40	49.10	42.40	51.60	44.00	42.60	29.10	30.70
11/09/92	39.80	58.30	52.60	57.00	47.00	53.20	41.10	43.30	54.20
11/17/92	57.80	37.50	40.70	42.20	43.00	39.00	51.60	48.70	45.70
11/23/92	49.20	56.60	54.70	58.20	56.30	57.20	70.40	58.80	73.90
12/01/92	53.00	34.10	46.70	47.00	39.20	33.30	38.10	42.00	40.00
12/08/92	50.40	46.70	76.40	49.80	55.80	62.00	57.50	57.90	34.20
12/14/92	56.60	67.90	63.70	78.50	59.90	56.40	47.80	76.10	69.40
12/21/92	40.60	39.40	53.70	54.40	30.70	60.00	52.10	53.00	56.80
12/30/92	31.50	49.80	49.10	51.80	40.50	30.60	43.00	22.20	44.60

NOTE: Activities shown are values actually measured.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Charcoal Cartridge Iodine-131 Activity (E-2 pCi/m³) - 1992

WEEK ENDING	INDICATOR LOCATION						CONTROL LOCATION		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/07/92	<1.37	<1.63	<1.59	<1.57	<1.67	<1.46	<1.61	<1.90	<1.83
01/14/92	<1.80	<1.99	<1.82	<1.71	<1.86	<1.53	<1.64	<2.02	<2.20
01/20/92	<1.99	<1.99	<1.84	<1.58	<2.04	<1.61	<2.42	<2.20	<2.36
01/27/92	<1.88	<1.91	<1.69	<1.43	<1.66	<1.43	<1.85	<1.66	<2.03
02/03/92	<1.86	<2.11	<1.46	<1.63	<2.03	<1.98	<2.02	<2.01	<1.85
02/11/92	<1.37	<1.58	<1.30	<1.44	<1.54	<1.18	<1.59	<1.80	<1.63
02/18/92	<1.61	<1.95	<1.76	<1.70	<1.79	<1.40	<1.79	<1.19	<1.86
02/24/92	<2.03	<2.12	<2.05	<1.83	<2.18	<1.78	<2.05	<2.06	<2.43
03/02/92	<1.72	<1.93	<1.80	<1.66	<2.01	<1.58	<1.84	<1.67	<1.84
03/10/92	<1.51	<1.49	<1.50	<1.58	<1.63	<1.25	<1.63	<1.59	<1.46
03/17/92	<2.00	<1.80	<1.58	<1.65	<2.08	<1.51	<1.70	<1.67	<1.85
03/24/92	<1.76	<2.04	<1.69	<2.20	<1.61	<1.59	<1.95	<1.94	<2.05
03/30/92	<1.94	<1.74	<1.53	<1.75	<2.12	<1.61	<1.51	<1.81	<2.06
04/06/92	<1.58	<1.84	<1.56	<1.68	<1.92	<1.59	<1.53	<1.50	<2.00
04/13/92	<1.48	<1.53	<1.38	<1.83	<1.90	<1.47	<1.36	<1.64	<1.78
04/22/92	<1.29	<1.19	<1.29	<1.31	<1.30	<1.17	<1.43	<1.37	<1.25
04/27/92	<1.89	<2.82	<2.16	<1.96	<2.96	<2.45	<2.54	<2.31	<2.16
05/04/92	<1.53	<2.12	<1.67	<1.21	<1.58	<1.46	<1.78	<1.78	<1.82
05/11/92	<2.26	<2.43	<2.13	<2.06	<3.67	<3.56	<2.90	<2.93	<2.98
05/19/92	<1.78	<2.05	<1.66	<1.92	<2.17	<1.68	<1.53	<1.69	<1.57
05/26/92	<1.80	<1.80	<1.52		<1.88	<1.90	<1.92	<1.77	<1.83
06/01/92	<2.04	<2.20	<2.03	<1.64	<2.18	<2.04	<2.01	<2.07	<2.09
06/09/92	<1.71	<1.76	<1.43	<1.59	<1.54	<1.58	<1.47	<1.81	<1.70
06/15/92	<1.99	<2.08	<1.83	<1.54	<2.27	<2.13	<1.99	<2.15	<1.88
06/22/92	<4.56	<1.73	<1.85	<1.31	<2.12	<1.77	<1.78	<1.96	<1.82
06/29/92	<1.75	<2.04	<1.64	<1.30	<1.59	<1.69	<1.63	<1.63	<1.50
07/06/92	<1.77	<1.59	<1.36	<1.60	<1.76	<1.56	<1.88	<1.67	<1.83
07/13/92	<1.73	<1.51	<1.40	<1.48	<1.89	<1.64	<1.68	<1.61	<1.63
07/20/92	<1.52	<1.38	<1.50	<1.50	<1.91	<1.85	<1.64	<1.51	<1.71
07/27/92	<1.85	<1.47	<1.15	<1.44	<1.96	<1.59	<1.78	<1.84	<1.66
08/04/92	<1.59	<1.23	<1.50	<1.39	<1.87	<1.54	<1.40	<1.65	<1.61
08/10/92	<1.92	<1.70	<1.41	<1.91	<1.99	<1.91	<1.84	<1.88	<1.74
08/17/92	<1.82	<1.56	<1.48	<1.35	<1.98	<1.73	<1.68	<1.81	<1.80
08/24/92	<1.94	<1.43	<1.28	<1.78	<2.01	<2.16	<1.99	<1.70	<1.75
09/01/92	<2.92	<2.59	<2.62	<3.06	<3.42	<1.71	<4.96	<6.43	<1.61
09/08/92	<1.57	<1.32	<1.54	<1.56	<2.11	<1.76	<1.99	<1.35	<1.82
09/14/92	<2.17	<1.74	<1.62	<1.86	<2.41	<2.31	<1.88	<1.85	<1.98
09/22/92	<1.34	<1.43	<1.28	<1.39	<1.90	<1.52	<1.42	<1.44	<1.65
09/28/92	<1.61	<1.49	<1.54	<1.83	<1.74	<1.65	<2.11	<2.27	<2.08
10/05/92	<1.40	<1.46	<1.30	<1.53	<1.28	<1.47	<1.64	<1.75	<1.73
10/12/92	<1.35	<1.45	<1.23	<1.82	<1.57	<1.53	<1.55	<1.43	<1.41
10/19/92	<1.39	<1.37	<1.26	<1.64	<1.34	<1.42	<1.58	<1.69	<1.61
10/26/92	<1.54	<1.37	<1.24	<1.36	<1.60	<1.53	<1.39	<1.19	<1.29
11/02/92	<1.25	<1.40	<1.25	<1.30	<1.65	<1.57	<1.49	<1.42	<1.29
11/09/92	<1.28	<1.42	<1.54	<1.58	<1.19	<1.39	<1.54	<1.71	<1.35
11/17/92	<1.51	<1.50	<1.47	<1.47	<1.50	<1.60	<1.68	<1.67	<1.45
11/23/92	<1.81	<1.76	<1.94	<2.03	<2.11	<1.68	<1.91	<1.58	<1.85
12/01/92	<1.35	<1.22	<1.43	<1.33	<1.27	<1.33	<1.26	<1.41	<1.35
12/08/92	<1.55	<1.78	<1.60	<1.56	<1.64	<1.56	<1.87	<1.43	<1.47
12/14/92	<1.57	<1.68	<2.32	<1.93	<2.23	<2.38	<2.09	<2.04	<2.03
12/21/92	<1.58	<1.48	<1.62	<1.65	<1.59	<1.31	<1.71	<1.25	<1.91
12/30/92	<1.24	<1.42	<1.24	<1.27	<1.16	<1.19	<1.18	<1.60	<1.34

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 be present, but if so, there cannot have been more present than the amounts noted).

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Charcoal Cartridge Cesium-137 Activity (E-2 pCi/m³) by Location - 1992

WEEK ENDING	INDICATOR LOCATIONS						CONTROL LOCATIONS		
	AA1	AB1	AR1	AKS	AP1	AQS2	ALC	AHS	AGS
01/07/92								1.26	
01/14/92	1.14								
01/20/92									
01/27/92									
02/03/92			1.20					0.73	
02/11/92							0.91		
02/18/92									
02/24/92									
03/02/92									
03/10/92									
03/17/92									
03/24/92									
03/30/92						1.03			1.04
04/06/92									
04/13/92									
04/22/92									
04/27/92		1.60							
05/04/92			0.98						
05/11/92									
05/19/92									
05/26/92									
06/01/92									
06/09/92									
06/15/92									
06/22/92									
06/29/92									
07/06/92									
07/13/92									
07/20/92									1.03
07/27/92									
08/04/92									
08/10/92									
08/17/92				1.04					
08/24/92									
09/01/92								4.15	
09/08/92									
09/14/92				1.07					
09/22/92								0.89	
09/28/92									
10/05/92									
10/12/92									
10/19/92									
10/26/92									
11/02/92		0.84							
11/09/92							0.85		
11/17/92									
11/23/92									
12/01/92						0.90			
12/08/92									
12/14/92									
12/21/92							1.14		
12/30/92									

NOTE: Activities shown are values actually measured.

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Normalized Gamma-Ray Exposure Summary (mR)
Quarterly Thermoluminescence Dosimeter Results for 1992

INDICATOR STATION	1ST QTR	2ND QTR	3RD QTR	4TH QTR
TA1	12.40	12.33	11.55	12.76
TA2	15.06	13.05	13.56	13.68
TB1	14.24	13.53	13.16	13.26
TB2	14.96	14.43	14.07	13.86
TC1	13.83	13.83	12.89	12.84
TC2	11.56	11.63	11.03	11.17
TCS	12.56	11.83	11.32	12.75
TD1	14.44	13.43	13.28	13.12
TD2	12.76	12.79	13.28	11.64
TE1	13.52	13.43	12.99	12.47
TE2	11.46	10.43	10.06	10.53
TF1	12.91	12.73	12.50	11.91
TF2	13.66	13.23	12.60	13.12
TG1	14.75	13.73	13.57	13.86
TG2	12.96	12.93	12.21	12.28
TH1	11.06	11.03	10.64	10.52
TH2	12.26	11.63	11.23	11.64
TJ1	11.88	11.93	11.72	11.73
TJ2	11.58	10.93	11.03	11.08
TK1	13.11	12.33	11.82	12.28
TK2	13.66	13.25	13.28	13.00
TKS	12.09	11.73	10.44	11.08
TL1	12.29	12.43	12.70	12.38
TL2	11.56	10.68	10.36	10.55
TLS	14.66	13.85	13.28	13.10
TM1	11.78	11.03	10.55	10.76
TM2	14.56	14.04	14.68	13.98
TN1	13.93	13.43	13.38	13.51
TN2	11.36	11.08	10.74	10.26
TP1	14.03	13.63	13.09	12.59
TP2	12.91	12.63	12.40	11.86
TQ1	12.80	12.93	11.92	12.13
TQ2	12.29	11.73	11.64	11.77
TQS1	13.21	13.43	12.59	13.03
TQS2	11.99	11.53	10.89	11.19
TR1	9.63	9.23	8.99	9.47
TR2	12.86	12.07	12.78	12.93
TRS	13.26	12.96	12.50	12.63
CONTROL STATION				
TAC	13.46	12.56	11.92	12.65
TEC	13.06	12.50	12.50	12.47
TGS	13.06	12.86	13.09	12.21
THS	14.66	14.04	13.18	13.98
TLC	11.66	10.88	10.18	10.56
TQS3	13.48	12.93	12.11	12.04

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Normalized Gamma-Ray Exposure Summary (mR)
Monthly Thermoluminescence Dosimeter Results for 1992

INDI-CATOR STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TA1	4.47	4.52	4.09	3.79	3.76	3.58	3.51	4.16	4.15	4.00	3.92	3.94
TA2	4.88	4.91	4.90	4.34	4.40	4.40	4.08	5.12	4.68	4.79	4.64	3.81
TB1	4.87	4.72	4.63	4.61	4.73	4.41	3.94	4.48	4.72	4.58	4.54	5.18
TB2	4.88	4.91	5.00	4.15	4.62	4.51	4.11	4.91	4.37	5.15	4.54	4.75
TC1	4.57	4.32	4.52	4.15	4.40	4.61	3.86	4.48	4.47	4.52	4.16	4.30
TC2	4.04	3.94	4.10	3.70	3.76	3.58	3.34	4.26	3.74	3.88	3.51	3.72
TCS	4.42	4.16	4.30	3.61		3.58	3.26	4.37	4.06	3.79	4.02	4.06
TD1	4.77	4.62	4.41	4.25	4.62	4.41	4.20	4.59	4.37	4.70	4.66	4.56
TD2	4.23	4.16	4.40	3.70		3.99	4.11	4.26	4.26	4.34	4.33	4.15
TE1	4.47	4.12	4.18	4.06	4.19	3.89	3.77	4.59	4.57	4.42	4.16	4.21
TE2	3.76	3.62	3.70	3.25	3.33	3.06	3.00	3.84	3.22	3.43	3.61	3.55
TF1	4.87	4.32	4.52	3.88	3.98	3.68	3.77	4.59	4.37	4.25	3.96	4.21
TF2	4.70	4.69	4.60	3.88	4.08	4.20	3.86	5.66	4.57	4.43	4.13	4.32
TG1	5.07	4.72	4.74	4.34	4.51	4.30	3.86	4.91	4.68	4.61	4.46	4.83
TG2	4.42	4.16	4.20	3.79	4.19	3.89	3.69	4.91	4.47	4.61	4.23	4.15
TH1	3.87	3.62	3.88	3.15	3.44	3.48	3.43	3.94	3.64	3.79	3.46	3.50
TH2	4.42	3.94	4.10	3.79	3.65	3.27	3.51	4.26	3.74	3.92	3.77	3.72
TJ1	4.17	4.32	4.41	3.70	4.19	3.58	3.34	4.16	4.16	3.97	3.76	3.77
TJ2	3.97	3.62	3.56	3.25	3.65	3.37	3.17	3.73	3.64	3.83	3.51	3.59
TK1	4.47	4.02	4.31	4.25	4.08	3.89	3.77	5.01	4.06	4.06	4.16	4.21
TK2	4.51	4.48	4.40	4.06	4.30	4.13	3.82	4.80	4.39	4.63	4.23	4.32
TKS	3.97	3.82	3.99	3.43	3.76	3.58	3.26	4.46	3.69	3.83	3.61	3.77
TL1	4.27	4.12	3.99	3.88	3.87	3.99	3.77	4.91	4.16	4.27	4.23	3.94
TL2	3.76	3.73	3.40	3.61	3.65	3.43	3.11	4.05	3.50	3.55	3.51	3.72
TLS	4.70	4.59	4.60	4.34	4.51	3.83	3.82	4.69	4.74	4.41	4.54	4.49
TM1	3.67	3.82	3.77	3.25	3.44	3.27	3.09	4.05	3.74	3.56	3.61	
TM2	5.17	4.91	5.00	4.52	4.19	4.53	4.08	5.01	5.27	5.06	4.64	4.49
TN1	4.57	4.22	4.41	3.97	4.08	4.10	3.94	4.59	4.37	4.45	4.33	4.32
TN2	3.95	3.73	4.00	3.25	3.33	3.03	3.12	3.94	3.77	3.56	3.92	3.63
TP1	4.77	4.22	4.41	4.15	4.40	3.58	4.11	4.80	4.57	4.54	4.23	4.49
TP2	4.34	4.05	3.99	3.84	3.76	4.13	3.73	4.59	4.36	4.26	4.44	3.94
TQ1	4.17	4.32	3.99	3.79	4.19	3.79	3.60	4.80	4.26	4.09	4.02	4.06
TQ2	4.34	4.05	4.31	3.75	3.87	3.73	3.56	4.37	4.09	3.96	4.33	3.94
TQS1	4.55	4.54	4.31	4.22	4.51	4.03	3.64	5.12	4.45	4.46	4.54	4.39
TQS2	4.14	3.86	4.20	3.56	3.76	3.53	3.38	4.37	4.00	3.86	4.02	3.68
TR1	3.27	3.02	3.13	2.97	3.12	2.96	2.83	3.94	3.31	3.03	2.89	2.95
TR2	4.32	4.05	4.20	3.61	4.19	3.83	3.56	4.69	4.36	4.56	4.31	4.15
TRS	4.60	4.48	4.50	4.25	4.30	4.23	4.00	5.23	4.64	4.06	4.31	4.32

CONTROL
STATION

TAC	4.51	4.37	4.60	3.79	3.98	3.73	3.64	5.12	4.49		4.31	4.12
TEC	4.32	4.05	4.40	4.06	3.98	3.89	3.69	4.26	4.37	4.06	4.02	4.41
TGS	4.70	4.69	4.40	3.97	3.87	3.93	3.82	4.69	4.39	4.31	4.33	4.23
THS	4.98	4.91	4.70	4.25	4.73	4.63	4.00	4.59	5.00	4.63	4.85	4.83
TLC	4.04	3.84	3.70	3.43	3.76	3.23	3.20	3.73	3.59	3.66	3.71	3.72
TQS3	4.54	4.60	4.41	4.06	3.98	3.79	3.77	4.91	4.16	4.09	3.99	4.26

RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gross Beta Activities (pCi/liter) in Water Samples - 1992

SAMPLING PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS		
	SWD	DW	DL	WD	SWU	WU	BLANK ¹
JAN	3.85	4.71	86.19		4.11		<1.65
FEB	4.83	3.58	65.81	<3.04	4.09	<3.02	<2.41
MAR	5.38	3.92	64.9		4.40		<1.91
APR	5.96	5.21	58.31		4.99		<1.96
MAY	3.27	3.86	51.75	<2.41	4.80	<2.41	<1.93
JUN	4.73	5.00	44.98		5.48		<1.95
JUL	9.96	10.37	295.30		8.87		<3.12
AUG	6.32	4.18	407.28	<2.68	5.78	<2.68	<2.14
SEP	5.40	4.43	245.70		4.94		<2.20
OCT	4.26	4.20	210.00		3.51		<1.73
NOV	3.77	5.51	131.10	<2.52	5.48	<2.52	<2.02
DEC	9.38	5.19	60.70		5.38		<2.02

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

Samples from SWD, DW, and SWU are composites of weekly grabs; samples from DL are composites of flow-weighted grabs. Samples from WU and WD 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 - 1992

SAMPLING PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS		
	SWD	DW	DL	WD	SWU	WU	BLANK ¹
JAN	<320	<324	6948	<323	<321	<322	<338
FEB	<345	<346	6043	<346	<342	<341	<324
MAR	<368	<371	7570	<371	<371	<366	<352
APR	<341	<343	11402	<339	<341	<343	<328
MAY	<351	<350	12195	<348	<352	<352	<331
JUN	<352	<349	4285	<349	<352	<352	<353
JUL	<342	<340	5871	<335	<336	<332	<338
AUG	<338	<340	4105	<337	<335	<334	<333
SEP	<342	<344	1662	<341	<340	<339	<340
OCT	<352	<366	2018	<361	<357	<357	<356
NOV	<340	<340	3158	<338	<336	<336	<336
DEC	<345	<345	1873	<344	<426	<343	<343

Tritium Activities (pCi/liter) in Quarterly Water Samples - 1992

SAMPLING PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS		
	SWD	DW	DL	WD	SWU	WU	BLANK ¹
QTR1	<339	<340	6824	<371	<339	<366	<352
QTR2	<364	<353	9849	<349	<354	<352	<360
QTR3	<360	<360	3785	<341	<355	<339	<351
QTR4	<348	<348	2517	<361	<350	<357	<347

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

Samples from SWD, DW, and SWU are composites of weekly grabs; samples from DL are composites of flow-weighted grabs; the samples from WD and WU are monthly grabs.

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 - 1992

BERYLLIUM-7

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU

None measured

POTASSIUM-40

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU

JAN	12.60	16.30	32.80		14.40	
FEB	9.42	20.80	41.30	18.20	17.20	14.00
MAR	17.00	17.20	25.10		13.00	
APR	10.10	17.60	39.80		15.00	
MAY	16.30	16.30	27.70	10.90	14.70	11.30
JUN		14.80	30.60		14.50	
JUL	23.10	17.40	14.40		17.20	
AUG	19.40	20.20		16.10		13.60
SEP	13.10	13.50			15.20	
OCT	15.10	16.60	45.50		14.20	
NOV	13.30	16.00	28.70	13.00	18.80	16.40
DEC	13.90	20.80	18.50		12.50	

CHROMIUM-51

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU

JAN			72.70			
FEB			49.40			
MAR			103.06			
APR						
MAY						
JUN						
JUL						
AUG						
SEP						
OCT			25.40			
NOV			23.60			
DEC			13.30			

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 - 1992

MANGANESE-54

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 1.68	< 1.91	50.30		0.67	
FEB	< 1.51	< 1.88	15.17	< 1.83	< 1.57	< 1.78
MAR	< 1.74	< 1.76	37.85		< 1.81	
APR	< 1.46	< 1.50	31.30		< 1.44	
MAY	< 1.62	< 1.65	22.21	< 1.47	< 1.75	< 1.58
JUN	< 1.60	< 1.47	10.70		< 1.57	
JUL	< 1.63	< 1.64	52.64		< 1.73	
AUG	< 1.82	< 1.50	89.04	< 1.72	< 1.44	< 1.74
SEP	< 1.75	< 1.66	97.03		< 1.71	
OCT	< 1.58	< 1.74	55.41		< 1.63	
NOV	< 1.77	< 1.73	47.50	< 1.46	< 1.74	< 1.60
DEC	< 1.37	< 1.53	17.29		0.56	

COBALT-58

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 1.88	< 2.04	11.41		< 2.00	
FEB	< 1.59	< 1.91	3.15	< 1.99	< 1.85	< 1.91
MAR	< 1.83	< 2.00	5.87		< 1.91	
APR	< 1.77	< 1.86	4.72		< 1.86	
MAY	< 1.92	< 1.94	3.14	< 1.88	< 1.87	< 1.80
JUN	< 1.99	< 1.87	3.08		< 2.00	
JUL	< 1.85	< 1.76	12.30		< 1.69	
AUG	< 2.31	< 1.96	16.50	< 2.16	< 1.90	< 1.96
SEP	< 1.94	< 2.12	6.22		< 2.03	
OCT	< 1.98	< 1.83	3.29		< 1.83	
NOV	< 1.89	< 1.98	2.08	< 1.79	< 2.09	< 2.01
DEC	< 1.67	< 1.91	1.65		< 1.69	

IRON-59

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 4.63	< 5.30	15.75		< 4.63	
FEB	< 4.14	< 4.78	5.28	< 4.69	< 4.63	< 4.17
MAR	< 4.03	< 4.58	< 15.80		< 4.47	
APR	< 4.71	< 4.94	< 16.20		< 4.57	
MAY	< 5.01	< 4.72	< 14.40	< 4.38	< 4.54	< 4.27
JUN	< 5.02	< 4.68	< 14.60		< 4.79	
JUL	< 3.77	< 3.92	< 8.18		< 4.12	
AUG	< 5.60	< 4.83	< 13.50	< 5.29	< 4.21	< 4.89
SEP	< 4.68	< 5.21	5.13		< 4.57	
OCT	< 3.90	< 4.13	< 7.07		< 3.90	
NOV	< 4.36	< 4.30	< 8.87	< 4.64	< 5.02	< 5.02
DEC	< 3.75	< 4.67	< 6.81		< 4.21	

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RIVER BEND STATION
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Gamma-Emitting Nuclide Activity (pCi/liter) in Water by Location - 1992

COBALT-60

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 1.77	<15.00	123.90		< 1.81	
FEB	< 1.47	<15.00	42.25	< 1.93	< 1.57	< 1.91
MAR	< 1.83	< 1.74	215.00		< 1.94	
APR	< 1.46	<15.00	107.71		< 1.42	
MAY	<15.00	< 1.59	107.70	< 1.48	< 1.50	< 1.69
JUN	< 1.53	< 1.51	115.14		< 1.56	
JUL	< 1.74	< 1.68	456.10		< 1.97	
AUG	0.80	< 1.61	772.50	<15.00	< 1.46	< 1.75
SEP	< 1.72	< 1.91	409.30		< 1.73	
OCT	< 1.78	< 1.88	207.80		< 1.69	
NOV	< 1.84	< 1.67	205.00	< 1.53	< 1.74	< 1.55
DEC	< 1.36	< 1.54	71.59		< 1.58	

ZINC-65

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 3.63	< 4.24	3.24		< 4.05	
FEB	< 3.29	< 4.05	< 7.49	< 3.89	< 3.34	< 4.13
MAR	< 4.02	< 3.94	<15.90		< 4.46	
APR	< 3.36	< 3.44	<13.90		< 3.07	
MAY	< 3.76	< 3.25	<13.00	< 3.43	< 3.55	< 3.48
JUN	< 3.57	< 3.44	<13.60		< 3.57	
JUL	< 3.48	< 3.51	23.70		< 4.10	
AUG	< 3.97	< 3.49	27.90	< 4.40	< 3.10	< 3.83
SEP	< 3.44	< 4.13	8.77		< 3.65	
OCT	< 3.67	< 4.09	3.97		< 3.44	
NOV	< 4.05	< 3.60	4.38	< 3.39	< 4.10	< 3.46
DEC	< 2.89	< 3.28	3.19		< 3.33	

NIOBIUM-95

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 2.43	< 2.73	1.82		< 2.48	
FEB	< 2.27	< 2.88	< 5.22	< 2.43	< 2.53	< 2.52
MAR	< 2.30	< 2.65	< 7.37		< 2.45	
APR	< 2.55	< 3.02	< 7.64		< 2.66	
MAY	< 2.84	< 2.58	< 6.96	< 2.24	< 2.51	< 2.44
JUN	< 2.68	< 2.70	< 6.98		< 2.53	
JUL	< 2.06	< 2.09	2.91		< 2.33	
AUG	< 3.27	< 2.80	<10.00	< 3.33	< 2.58	< 2.55
SEP	< 2.49	< 2.93	< 5.82		< 2.58	
OCT	< 2.33	< 2.30	< 4.33		< 1.90	
NOV	< 2.56	< 2.38	< 5.45	< 2.74	< 2.63	< 2.90
DEC	< 2.35	< 2.72	< 3.83		< 2.31	

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Gamma-Emitting Nuclide Activity (pCi/liter) in Water by Location - 1992

ZIRCONIUM-95

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 3.40	< 3.69	2.08		< 3.72	
FEB	< 3.15	< 3.68	< 6.52	< 3.69	< 3.35	< 3.81
MAR	< 3.24	< 3.49	< 11.20		< 3.44	
APR	< 3.04	< 3.64	< 11.60		< 3.27	
MAY	< 3.35	< 3.22	< 9.67	< 3.17	< 3.42	< 3.47
JUN	< 3.43	< 3.08	< 10.50		< 3.42	
JUL	< 3.28	< 3.24	< 8.17		< 3.37	
AUG	< 4.00	< 3.24	< 13.10	< 3.83	< 3.31	< 3.41
SEP	< 3.42	< 3.71	< 8.18		< 3.50	
OCT	< 3.26	< 3.21	< 6.19		< 3.16	
NOV	< 3.47	< 3.43	< 7.83	< 3.12	< 3.78	< 3.53
DEC	< 2.96	< 3.39	< 4.86		< 2.99	

IODINE-131

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 2.95	< 5.78	< 8.47		< 3.17	
FEB	< 4.75	< 5.80	< 12.30	< 3.17	< 6.28	< 3.49
MAR	< 2.51	< 3.98	< 3.94		< 2.71	
APR	< 10.70	< 11.90	< 9.39		< 12.90	
MAY	< 5.77	< 5.64	< 14.80	< 5.06	< 3.81	< 3.16
JUN	< 9.03	< 10.60	< 5.69		< 8.66	
JUL	< 2.30	< 1.89	< 2.24		< 2.05	
AUG	< 7.53	< 8.62	< 7.30	< 5.11	< 8.74	< 4.77
SEP	< 4.60	< 4.31	< 5.88		< 5.01	
OCT	< 2.01	< 1.81	< 3.12		< 1.93	
NOV	< 2.86	< 5.00	< 5.14	< 14.50	< 4.74	< 14.70
DEC	< 7.81	< 11.30	< 12.90		< 7.90	

CESIUM-134

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 1.53	< 1.76	< 3.37		< 1.86	
FEB	< 1.47	< 1.57	< 3.17	< 1.80	< 1.33	< 1.76
MAR	< 1.61	< 1.66	< 5.80		< 1.59	
APR	< 1.38	< 1.48	< 4.98		< 1.37	
MAY	< 1.64	< 1.45	< 4.64	< 1.28	< 1.47	< 1.63
JUN	< 1.46	< 1.39	< 5.13		< 1.47	
JUL	< 1.59	< 1.53	< 3.32		< 1.83	
AUG	< 1.78	< 1.43	< 4.48	< 1.78	< 1.37	< 1.57
SEP	< 1.57	< 1.68	< 3.10		< 1.57	
OCT	< 1.56	< 1.73	< 2.72		< 1.55	
NOV	< 1.73	< 1.57	< 3.28	< 1.34	< 1.80	< 1.43
DEC	< 1.39	< 1.42	< 1.81		< 1.40	

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RIVER BEND STATION
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Gamma-Emitting Nuclide Activity (pCi/liter) in Water by Location - 1992

CESIUM-137

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 1.48	< 1.85	< 3.40		< 1.78	
FEB	< 1.47	< 1.67	< 3.22	< 1.80	< 1.44	< 1.94
MAR	< 1.64	< 1.61	< 6.28		< 1.82	
APR	< 1.36	< 1.51	< 5.55		< 1.29	
MAY	< 1.66	< 1.46	< 5.12	< 1.37	< 1.37	< 1.09
JUN	< 1.44	< 1.42	< 5.43		< 1.49	
JUL	< 1.78	< 1.60	< 3.75		< 1.79	
AUG	< 1.72	< 1.53	< 5.07	< 1.72	< 1.43	< 1.51
SEP	< 1.60	< 1.70	< 3.32		< 1.56	
OCT	< 1.56	< 1.71	< 3.03		< 1.60	
NOV	< 1.65	< 1.58	< 3.59	< 1.38	< 1.66	< 1.46
DEC	< 1.32	< 1.43	< 1.91		< 1.50	

BARIUM-140

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	<19.80	<23.30	<34.10	<17.50	<18.60	
FEB	<17.90	<27.80	<37.80		<25.80	<17.60
MAR	<14.70	<19.70	<30.70		<13.60	
APR	<31.10	<37.10	<52.30	<21.90	<35.80	
MAY	<26.90	<25.00	<44.60		<25.20	<19.10
JUN	<33.50	<32.80	<36.20		<29.40	
JUL	<14.50	<11.70	<30.30	<23.80	<11.80	
AUG	<33.90	<32.60	<11.00		<31.40	<25.00
SEP	<23.10	<24.80	<46.70		<23.80	
OCT	<14.50	<12.60	<26.90	<34.10	<11.50	
NOV	<7.70	<19.80	<36.10		<20.00	<34.90
DEC	<21.50	<34.90	<43.50		<22.90	

LANTHANUM-140

PERIOD	INDICATOR LOCATIONS				CONTROL LOCATIONS	
	SWD	DW	DL	WD	SWU	WU
JAN	< 8.55	<10.30	<11.80		< 7.21	
FEB	< 7.08	<11.90	<14.10	< 7.77	< 9.59	< 7.10
MAR	< 5.58	< 8.48	<11.60		< 5.80	
APR	<12.30	<16.10	<20.90		<12.90	
MAY	<11.80	< 9.71	<14.30	< 8.34	< 9.54	< 7.78
JUN	<13.20	<13.70	<14.30		<11.40	
JUL	< 6.22	< 4.14	< 6.51		< 6.08	
AUG	<13.90	<13.50	< 4.53	<10.40	<12.60	< 8.87
SEP	< 8.67	<10.80	<11.40		< 8.87	
OCT	< 6.11	< 5.25	< 7.09		< 4.43	
NOV	< 8.07	< 8.47	<12.10	<14.50	< 8.27	<14.80
DEC	< 8.31	<15.70	<13.20		< 9.20	

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RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclides in Sediment (pCi/kg dry) by Location - 1992

<u>PERIOD</u>	<u>POTASSIUM-40</u>		<u>BERYLLIUM-7</u>	
	<u>DOWNSTREAM</u>	<u>UPSTREAM</u>	<u>DOWNSTREAM</u>	<u>UPSTREAM</u>
MAY	17019.00	7749.00		185.00
OCT	15478.00	7080.00		

<u>PERIOD</u>	<u>CESIUM-134</u>		<u>CESIUM-137</u>	
	<u>DOWNSTREAM</u>	<u>UPSTREAM</u>	<u>DOWNSTREAM</u>	<u>UPSTREAM</u>
MAY	<29.70	<29.60	<35.80	28.30
OCT	<45.50	<20.30	49.10	15.30

Gamma-Emitting Nuclides in Fish (pCi/kg wet) by Location - 1992

<u>PERIOD</u>	<u>POTASSIUM-40</u>			<u>UPSTREAM</u>		
	<u>DOWNSTREAM</u>			<u>UPSTREAM</u>		
	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>
JUL	3006	2332	2625	2247	2081	3122
DEC	3421	2459	2161	3553	2744	2298

<u>PERIOD</u>	<u>MANGANESE-54</u>			<u>UPSTREAM</u>		
	<u>DOWNSTREAM</u>			<u>UPSTREAM</u>		
	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>
JUL	<78.5	<75.6	<54.0	<84.8	<65.6	<77.7
DEC	<21.1	<14.4	<11.4	<18.5	<19.9	<14.8

<u>PERIOD</u>	<u>IRON-59</u>			<u>UPSTREAM</u>		
	<u>DOWNSTREAM</u>			<u>UPSTREAM</u>		
	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>
JUL	<210.0	<140.0	<136.0	<195.0	<169.0	<214.0
DEC	<84.5	<51.2	<49.6	<64.1	<73.4	<54.9

<u>PERIOD</u>	<u>COBALT-58</u>			<u>UPSTREAM</u>		
	<u>DOWNSTREAM</u>			<u>UPSTREAM</u>		
	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>
JUL	<92.5	<81.3	<61.3	<60.3	<56.6	<85.2
DEC	<26.1	<16.9	<16.3	<23.9	<23.5	<16.9

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Gamma-Emitting Nuclides in Fish (pCi/kg wet) by Location - 1992

COBALT-60						
<u>PERIOD</u>	<u>DOWNSTREAM</u>			<u>UPSTREAM</u>		
	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>
JUL	<89.2	<70.4	<63.4	<97.4	<59.2	<94.9
DEC	<24.1	<16.3	<17.9	<21.2	<17.2	<15.7

ZINC-65						
<u>PERIOD</u>	<u>DOWNSTREAM</u>			<u>UPSTREAM</u>		
	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>
JUL	<205.0	<139.0	<146.0	<171.0	<133.0	<184.0
DEC	<59.1	<40.0	<34.0	<56.9	<51.0	<34.8

CESIUM-134						
<u>PERIOD</u>	<u>DOWNSTREAM</u>			<u>UPSTREAM</u>		
	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>
JUL	<78.9	<56.7	<53.3	<75.9	<52.2	<85.2
DEC	<19.4	<12.6	<11.1	<16.3	<17.9	<13.20

CESIUM-137						
<u>PERIOD</u>	<u>DOWNSTREAM</u>			<u>UPSTREAM</u>		
	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>
JUL	<76.4	<60.3	<56.0	<82.2	<67.5	<88.9
DEC	<20.1	<14.4	<13.3	<17.1	<17.9	<14.4

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Gamma-Emitting Nuclide Activity (pCi/kg wet) in Broadleaf Vegetation - 1992

Site Garden #1

COLLECTION DATE	CS-134	CS-137	I-131	BE-7	K-40
01/09/92	<18.60	<22.40	<19.70	169	1458
01/17/92	<39.70	<39.30	<30.50	337	3637
01/24/92	<18.60	<19.80	<19.70	188	2071
02/13/92	<31.40	<22.70	<30.90	273	266
02/20/92	<15.70	<17.20	<17.40	91	807
02/28/92	<19.80	<19.30	<16.40	73	1667
03/16/92	<29.90	<34.30	<26.20	206	1899
03/20/92	<28.20	<32.90	<19.90	196	1866
03/27/92	<26.20	<32.00	<24.00	318	
04/10/92	<28.10	<38.50	<27.50	272	2571
04/23/92	<26.30	<23.90	<25.90	206	1958
04/30/92	<31.80	<31.20	<32.80	221	2390
05/22/92	<40.50	<43.70	<35.00	232	2996
05/22/92	<31.30	<35.40	<26.30		4312
05/28/92	<31.30	<34.40	<30.60	304	2218
06/13/92	<34.70	<31.90	<29.00	286	4153
06/19/92	<32.10	<38.30	<33.40	256	1853
06/24/92	<36.40	<40.20	<32.90		2935
07/11/92	<42.70	<44.40	<35.60	165	3226
07/19/92	<28.70	<29.90	<23.60	395	2541
07/23/92	<23.50	<28.10	<22.30	269	1933
08/20/92	<26.50	<26.30	<22.60	213	2061
08/20/92	<30.40	<31.20	<23.90	128	2320
09/04/92	<22.60	<27.80	<23.60	256	3441
08/31/92	<25.30	<25.90	<48.30	822	
09/17/92	<33.00	<33.10	<28.50	806	4369
09/25/92	<30.20	<29.90	<22.30	166	1258
10/09/92	<21.90	<23.10	<20.20		1926
10/20/92	<33.30	<33.10	<30.10		4040
10/23/92	<45.10	<44.10	<34.20		1519
11/11/92	<39.10	<31.50	<33.90	256	2030
11/20/92	<34.40	<37.00	<24.20		1485
11/30/92	<40.90	<36.20	<34.70	416	3458
12/17/92	<25.70	<30.20	<26.00	132	1462
12/17/92	<36.70	<36.70	<30.40	640	
12/31/92	<20.40	<25.10	<21.60	336	3447

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RIVER BEND STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Gamma-Emitting Nuclide Activity (pCi/kg wet) in Broadleaf Vegetation - 1992

Site Garden #2

COLLECTION DATE	CS-134	CS-137	I-131	BE-7	K-40
01/09/92	<19.90	<23.90	<21.20	451	3919
01/17/92	<49.70	<47.50	<35.20	492	4942
01/24/92	<21.20	<23.70	<18.70	641	3640
02/13/92	<27.10	<27.10	<23.40	202	1602
02/20/92	<18.10	<17.40	<16.40	92	2722
02/28/92	<30.00	<29.20	<24.10	245	2981
03/16/92	<23.50	<31.60	<29.70		1807
03/20/92	<26.10	<34.40	<29.10	307	2952
03/27/92	<31.20	<33.70	<28.60	434	
04/10/92	<30.40	<31.10	<29.20		3694
04/23/92	<20.90	<26.40	<20.10		3123
04/30/92	<39.70	<39.80	<30.60		3613
05/22/92	<31.20	<34.90	<27.10	216	5403
05/22/92	<36.00	<42.10	<31.20		1851
05/28/92	<29.20	<27.90	<24.50		3239
06/13/92	<27.80	<30.70	<27.90	157	3035
06/19/92	<17.70	<18.60	<21.40	156	3488
06/24/92	<25.10	<26.30	<24.40	699	4448
07/11/92	<27.70	<36.80	<36.20	366	2931
07/19/92	<25.10	<34.90	<28.20	828	4481
07/23/92	<20.60	<25.00	<21.40	251	4140
08/20/92	<43.00	<44.70	<38.70	601	3796
08/20/92	<24.10	<25.90	<24.30		3397
09/04/92	<27.50	<29.30	<27.20		3025
08/31/92	<29.10	<26.90	<55.60		
09/17/92	<30.40	<33.40	<32.40	831	2920
09/25/92	<29.80	<31.40	<28.10	647	4126
10/09/92	<25.80	<29.20	<28.50		3163
10/20/92	<57.90	<56.80	<54.70	679	3442
10/23/92	<38.00	<45.40	<40.90	663	4813
11/11/92	<16.10	<17.20	<15.20	133	2616
11/20/92	<54.50	<67.70	<40.90		2836
11/30/92	<36.50	<36.70	<29.00	328	4732
12/17/92	<21.40	<25.80	<23.70	186	
12/17/92	<32.50	<34.70	<27.10	259	4901
12/31/92	<25.60	<35.50	<35.70	212	4206

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 - 1992

Control Location - Angola State Prison

COLLECTION DATE	CS-134	CS-137	I-131	BE-7	K-40
01/03/92	<19.80	<24.50	<25.60	78	4043
01/03/92	<15.90	<16.80	<18.30		2665
01/03/92	<20.20	<20.70	<27.10		3394
02/06/92	<33.10	<35.10	<30.20	199	2342
02/06/92	<26.00	<33.00	<33.90	258	4360
02/06/92	<24.80	<23.40	<26.30	303	3601
03/06/92	<31.40	<33.70	<28.40	534	2518
03/06/92	<23.80	<30.10	<26.50	287	
03/06/92	<30.60	<30.90	<26.20	355	2985
04/03/92	<22.40	<28.20	<25.20	215	4262
04/03/92	<19.70	<20.60	<22.70	155	2381
04/03/92	<21.73	<28.60	<24.00	201	5409
05/06/92	<29.40	<31.90	<40.00	218	5320
05/06/92	<29.40	<31.70	<31.00		4351
05/06/92	<24.50	<27.20	<29.60	292	6411
06/03/92	<29.80	<31.90	<26.60	1878	3690
06/03/92	<18.20	<19.50	<19.00	237	3798
06/03/92	<26.80	<26.40	<25.10	1298	3984
07/02/92	<26.10	<26.80	<30.30	1024	3226
07/02/92	<26.60	<28.40	<31.60	1992	4755
07/02/92	<23.40	<25.10	<27.80	1227	3486
08/06/92	<39.60	<40.10	<37.70	771	5113
08/06/92	<43.30	<45.40	<44.00	2349	3743
08/06/92	<32.80	<34.90	<39.90	524	4043
09/03/92	<28.20	<30.60	<27.90	307	2857
09/03/92	<23.30	<28.70	<25.40	1110	4520
09/03/92	<30.10	<30.60	<25.40	259	4984
10/02/92	<17.00	<19.90	<21.30	112	
10/02/92	<13.60	<16.50	<21.70		4722
10/02/92	<17.40	<19.70	<28.50	153	5162
11/05/92	<37.20	<38.30	<34.10		3516
11/05/92	<31.10	<35.20	<34.00		4310
11/05/92	<30.50	<36.40	<28.30		1971
12/03/92	<22.60	<25.70	<21.40	82	2603
12/03/92	<21.40	<22.60	<17.30	98	3086
12/03/92	<21.60	<24.20	<28.10	138	3987

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 OPERATING REPORT FOR 1992

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		Control Locations Mean (f) ² Range	Number of Nonroutine Reported Results
				Name Dist./Dir.	Mean(f) ² Range		
Air Particulate (pCi/m ³)	Gross Beta (1056)	0.01	0.03 (752/759) 0.01 - 0.09	AQS2 5.5 km NW	0.03(146/158) 0.0 - 0.09	0.03 (326/327) 0.01 - 0.05	N/A
	Cs-134 (95)	0.05	ALL <LLD			ALL <LLD	N/A
	Cs-137 (95)	0.06	ALL <LLD			ALL <LLD	N/A
Air Radioiodine (pCi/m ³)	I-131 (1056)	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	7.9 (27/28) 3.2 - 16.2	6.7(139/150) 0 - 27.5	N/A
	Gamma Quarterly (472)		19.0 ³ (404/418) 6.8 - 32.1	TC1 1.6 km SE	27.5 ³ (11/11) 12.2 - 27.6	18.9 ³ (51/54) 6.5 - 23.5	N/A
Surface Water (pCi/liter)	H-3 (24)	2000	ALL <LLD			ALL <LLD	N/A
	Mn-54 (68)	15	ALL <LLD			ALL <LLD	N/A
	Co-58 (68)	15	ALL <LLD			ALL <LLD	N/A
	Fe-59 (68)	30	ALL <LLD			ALL <LLD	N/A
	Co-60 (68)	15	ALL <LLD			ALL <LLD	N/A
	Zn-65 (68)	30	ALL <LLD			ALL <LLD	N/A
	Nb-95 (68)	15	ALL <LLD			ALL <LLD	N/A
	Zr-95 (68)	30	ALL <LLD			ALL <LLD	N/A
	I-131 (68)	15	ALL <LLD			ALL <LLD	N/A
	Cs-134 (68)	15	ALL <LLD			ALL <LLD	N/A
	Cs-137 (68)	16	ALL <LLD			ALL <LLD	N/A
	Ba-140 (68)	60	ALL <LLD			ALL <LLD	N/A
	La-140 (68)	15	ALL <LLD			ALL <LLD	N/A
	Gross Beta (52)	4	8.1 (23/26) 4 - 12	SWD 4 km downstream	8.1 (23/26) 4 - 12	7.8 (24/26) 5 - 13	N/A

TABLE B.1

PREOPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
(Page 2 of 4)River Bend Station
West Feliciana Parish, LouisianaDocket 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		Control Locations, Mean (f) ² Range	Number of Nonroutine Reported Results
				Name Dist./Dir	Mean(f) ² Range		
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 ² Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) ² Range	Number of Nonroutine Reported Results
				Name Dist./Dir.	Mean(f) ² Range		
Drinking Water ⁵ (pCi/liter) (continued)	Zr-95 (40)	30	ALL <LLD	Donaldson- ville 138 km downstream	6.8 (28/28) 3 - 12	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			7.8 (24/26) 5 - 13	N/A
Shoreline Sediment (pCi/kg drv)	K-40 ⁶ (2)	NONE REQUIRED	13.7E3 (2/2) (11.4-15.9)E3	SEDD 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	1315 (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		Control Locations Mean (f) ² Range	Number of Nonroutine Reported Results
				Name Dist./Dir.	Head(f) ² Range		
Fish/ Invertebrates (continued)	Co-58 (15)	130	ALL <LLD			ALL <LLD	N/A
	Fe-59 (15)	260	ALL <LLD ⁸			ALL <LLD ⁵	N/A
	Co-60 (15)	130	ALL <LLD			ALL <LLD	N/A
	Zn-65 (15)	260	ALL <LLD			ALL <LLD	N/A
	Cs-134 (15)	130	ALL <LLD			ALL <LLD	N/A
	Cs-137 (15)	150	ALL <LLD			ALL <LLD	N/A
Broadleaf Vegetation (pCi/kg wet)	K-40 ⁶ (11)	NONE REQUIRED	3368 (6/10) 1398 - 5389	G2 1.1 km NW	3368 (6/10) 1398 - 5389	3768 single value	N/A
	I-131 (75)	60	ALL <LLD ⁷			ALL <LLD	N/A
	Cs-134 (76)	60	ALL <LLD			ALL <LLD	N/A
	Cs-137 (76)	80	97 (4/43) 59 - 120	G1 1 km WNW	97 (4/43) 59 - 120	ALL <LLD	N/A

NOTES:

1. Lower Limit of Detection (LLD) as defined in RBS Technical Specifications (NUREG-1172).
2. Mean and range based on detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)
3. For each of the TLD locations in 1985, a value equal to 1/3 of its 4th Quarter gamma dose is used to simulate a "quarterly" measurement for October, 1985.
4. Beginning in January, 1985, groundwater was sampled from one upgradient (WU - control) and one downgradient (WD - indicator) well; previously groundwater was sampled from construction dewatering wells.
5. The upstream surface water sampling location (SWU) is used as a "control" for drinking water 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 8 I-131 analyses; 1 out of 9 Cs-134 analyses; 1 out of 9 Cs-137 analyses; 2 out of 9 Ba-140 analyses; and 4 out of 9 La-140 analyses. Similarly, the required LLD for I-131 in broadleaf vegetation was not met in 1 out of 11 analyses. (See discussion of Program Exceptions in Preoperational Radiological Environmental Monitoring Report for 1985.)
8. The LLD for one downstream fish sample (catfish, analyzed in-house) was 265 pCi/kg (wet). The LLD for one upstream fish sample (largemouth bass, analyzed in-house) was 263 pCi/kg (wet).