

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1983

GRAND GULF NUCLEAR STATION

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PREFACE

This report presents the data obtained through the analysis of environmental samples collected for the Grand Gulf Nuclear Station (GGNS) Operational Radiological Environmental Surveillance Program for the period January 1, 1983 through December 31, 1983.

The analytical contractor for GGNS is Eberline Instrument Corporation, a division of Thermo Electron Corporation. Eberline has been the analytical contractor since the initiation of the GGNS Radiological Environmental Surveillance Program in 1978.

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SECTION 1
INTRODUCTION & SUMMARY

1.1 INTRODUCTION

Site Location

Grand Gulf Nuclear Station (GGNS) is located in Claiborne County, Mississippi. The site is on the east bank of the Mississippi River, approximately 25 miles south-southwest of Vicksburg, Mississippi, and 37 miles north-northeast of Natchez, Mississippi. Grand Gulf Military Park borders a portion of the north side of the property, and the community of Grand Gulf is approximately 1.5 miles to the north. The town of Port Gibson is approximately 6 miles southeast of the site. Two lakes, Hamilton Lake and Gin Lake, are located in the western portion of the site.

History of Operation and Present Status

The Station consists of two Boiling Water Reactors (BWRs) rated at 1250 MWe each. Unit 1 received a Low-Power Operating License on June 16, 1982. Fuel loading began on July 1, 1982 and was completed on August 6, 1982. Initial criticality was achieved on August 18, 1982.

Low-power testing began on September 25, 1983 and was discontinued on November 8, 1983 with 995.3 hours of operation at less than 5 percent power recorded for Unit 1. Testing is anticipated to resume in the summer of 1984, and commercial operation is planned for late 1984.

The following list summarizes significant dates associated with the operation of Unit 1:

- | | |
|----------------------------------|--------------------|
| o Low-Power Operating License | June 16, 1982 |
| o Initial Criticality | August 18, 1982 |
| o Began Low-Power Testing | September 25, 1983 |
| o Discontinued Low-Power Testing | November 8, 1983 |

Unit 2 is in a construction phase and was 33.0% complete as of December 31, 1983.

Purpose and Design Criteria of the Radiological Environmental Surveillance Program

Grand Gulf Nuclear Station has been designed to keep radioactive releases as low as reasonably achievable. The quantities of radionuclides released to the environment are expected to be insignificant as a source of potential exposure.

The purpose of the Radiological Environmental Surveillance Program is:

- o To measure radiation levels and their variations in environmental media in the area surrounding the plant
- o To yield average values of radiation levels and concentrations of radioactive material in various media of the environment
- o To evaluate environmental procedures, equipment, and techniques
- o To detect what effect, if any, operation of GGNS will have on the radiation levels and concentrations in the environment around GGNS.

The design criteria for the Radiological Environmental Surveillance Program are:

- o To analyze the important pathways for anticipated types and quantities of radionuclides released from the Station into the surrounding environment
- o To consider the possibility of a buildup of long-lived radionuclides in the environment and identify physical and biological sites of accumulation that may contribute to human exposures
- o To consider the potential radiation exposure to important plant and animal life in the environment surrounding GGNS
- o To correlate levels of radiation and radioactivity in the environment with radioactive releases from Station operation.

Dose Pathways Associated with GGNS

The most significant environmental dose pathways from a nuclear power station are direct doses from the gaseous effluent and thyroid dose due to the ingestion of milk. The operation of GGNS is expected to have little, if any, impact from these pathways due to the remote location of the station and the absence of milking animals within 5 miles. Also, since the first use of Mississippi River water as drinking water is more than 200 miles downstream of GGNS, the dose from this pathway is expected to be minimal.

1.2 SUMMARY

Preoperational Study

The Preoperational Radiological Environmental Surveillance Program was initiated in July, 1978. It was continued until GGNS received its Low-Power Operating License for Unit 1 on June 16, 1982. The background data gathered during the Preoperational Program was included in the 1982 Annual Radiological Environmental Operating Report.

Annual Radiological Environmental Operating Reports (AREOR)

1982 AREOR

GGNS Unit 1 received a Low-Power Operating License on June 16, 1982. During 1982 the Station did not enter a power ascension mode. Therefore, the results of the Operational Environmental Surveillance Program from June 16, 1982 to December 31, 1982 are actually an extension of the preoperational program data. The data was presented in Tables 8-12 of the 1982 AREOR.

1983 AREOR

Unit 1 of GGNS saw 995.3 hours of low-power operation between September 25 and November 8, 1983. Based on the results of the Radiological Environmental Surveillance Program, GGNS had no effect on the levels of radiation in the environs surrounding the plant.

The data accumulated during the 1983 Radiological Environmental Surveillance Program is presented for your review in the following manner:

- o Section 2 - Discussion of the Radiological Environmental Surveillance Program and sample collection sites relative to the distance and direction from GGNS Unit 1 for:
 - Air Samples
 - TLDs
 - Milk Samples
 - Water Samples
 - Vegetation Samples
 - Fish Samples
 - Sediment Samples
 - Special Samples
- o Section 3 - Discussion of the analytical procedures and counting methods utilized by the analytical contractor.
- o Section 4 - Discussion of the results for each type of sampling and the exceptions which occurred in the Radiological Environmental Surveillance Program during 1983.
- o Section 5 - Summary of the radiological environmental surveillance data reported by the analytical contractor during 1983.
- o Section 6 - Summary of the 1983 quality control data
 - Results of United States Environmental Protection Agency - Eberline Intercomparison Program
 - Results of Batelle Northwest - Eberline TLD Intercomparison Program
- o Section 7 - Sampling and analysis results for 1983

SECTION 2
RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE PROGRAM

2.1 AIR PARTICULATES AND RADIOIODINES

The GGNS Environmental Surveillance Program utilizes eleven continuous air monitors to provide beta, gamma, and radioiodine activity measurements in the airborne exposure pathway. The locations of these monitors range from 0 to 18 miles, as identified in Figures 2-1 through 2-3 and Table 2-1. Five of the air samples are used to satisfy the requirements of GGNS Technical Specification 4.12.1. The five required monitors are as follows:

- o Three near the site (0-1 mile) in areas of the highest X/Q values. Section 4.1 Air Particulates and Radioiodine explains 1983 required Technical Specification locations.
- o One in a community that has the highest X/Q value (Port Gibson).
- o One in a control location (Vicksburg).

The remaining six samplers are located in areas which will provide additional data for the Radiological Environmental Surveillance Program.

The samplers are placed in weatherproof houses approximately one meter above the ground. A two-inch glass fiber filter is located in the intake line of the vacuum pump with a 2 x 1-inch charcoal cartridge located directly downstream. Flows are adjusted to approximately 1.25 cubic feet per minute. Filters and cartridges are changed weekly and analyzed for gross beta and radioiodine activity, respectively. In addition, the filters are composited quarterly and analyzed for gamma-emitting radionuclides.

FIGURE 2-1



FIGURE 2-2

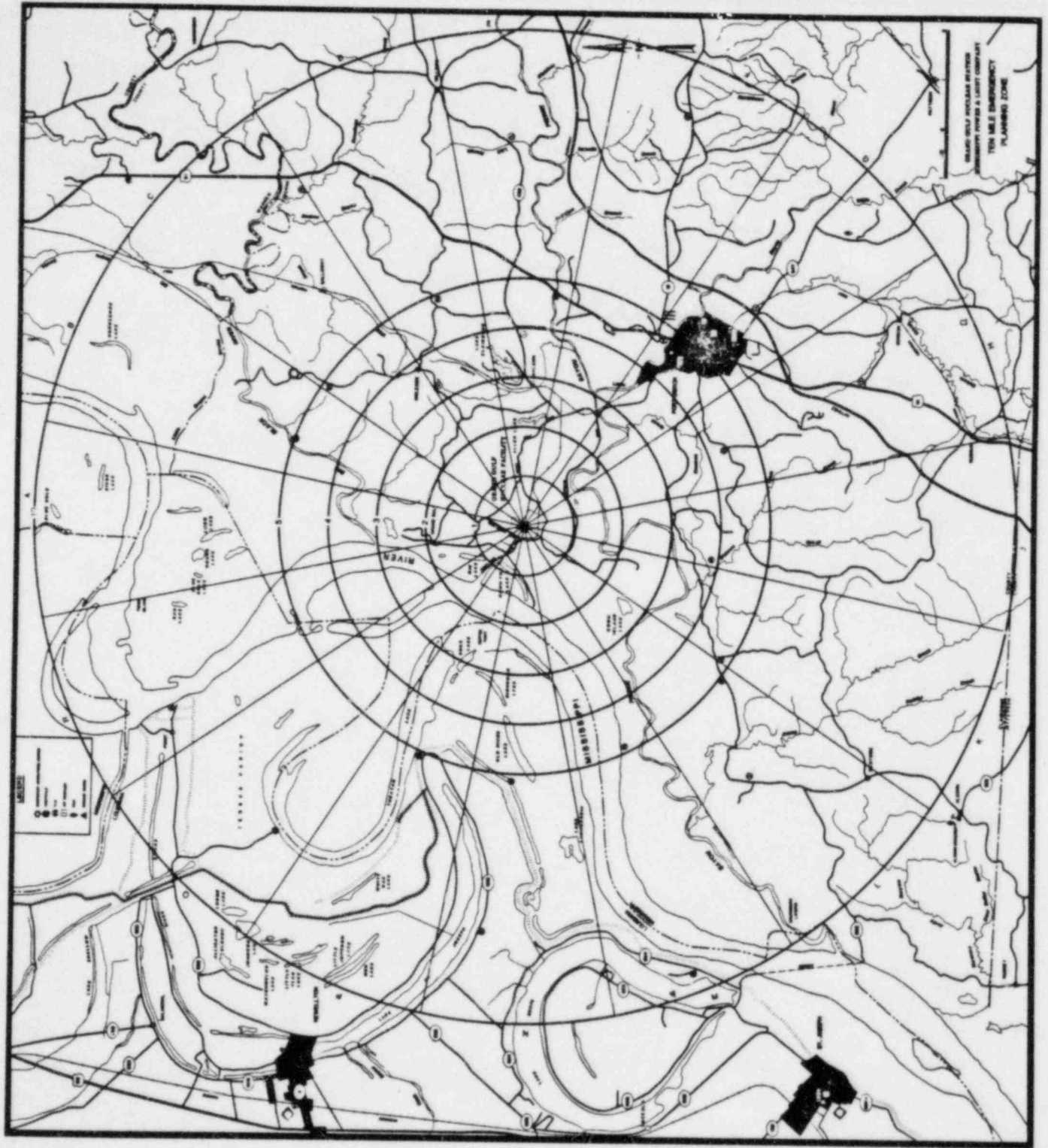


FIGURE 2-3

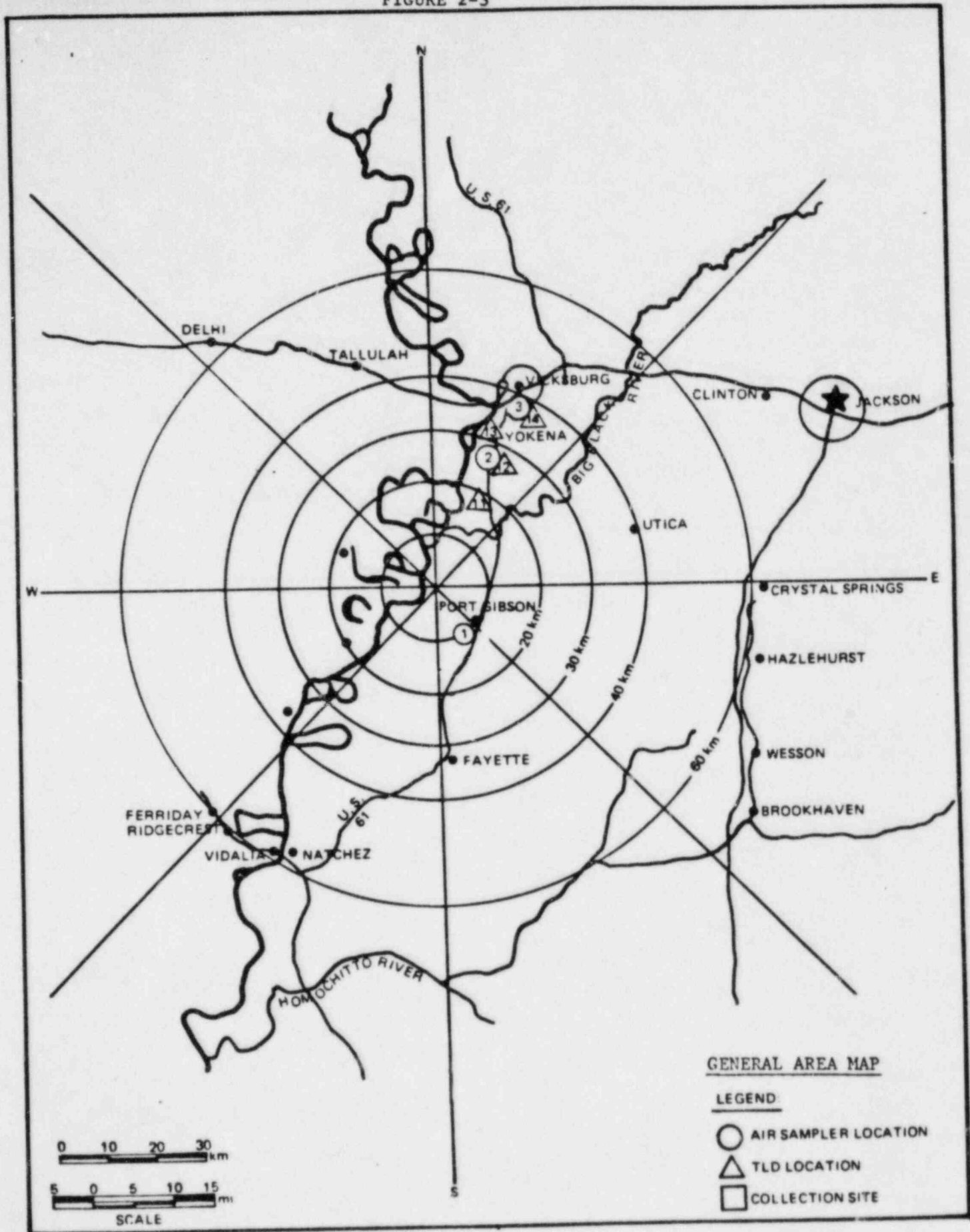


TABLE 2-1

AIR SAMPLE COLLECTION SITES

<u>AIR SAMPLES NUMBER</u>	<u>LOCATION</u>
*, **AS-1 PG	Southeast of GGNS at the Port Gibson City Barn (Sector G Radius 5.5 miles)
AS-2 61N	North Northeast of GGNS, on Hwy 61 south across from the Yokena Church (Sector B Radius 13 miles)
*AS-3 61 VA	North Northeast of GGNS on Hwy 61 south at the ** Vicksburg Airport (Sector B Radius 18 miles)
*AS-4 GJOE	Southwest of GGNS. Glodjo property on Waterloo Road (Sector L Radius .9 miles)
AS-5 TC	South of GGNS behind MP&L Training Center building. (Sector J Radius .4 miles)
**AS-6 RS	Northeast of GGNS, south of Grand Gulf Road (Sector C Radius .5 miles)
*, **AS-7 MT	North of GGNS, located next to the Meteorological Tower (Sector A Radius .8 miles)
**AS-8 WR	East of GGNS, located at Maggie Jackson's trailer on Waterloo Road near the Eastern Site Boundary (Sector E Radius .5 miles)
*AS-9 GGMP	North of GGNS, located in Grand Gulf Military Park (Sector A Radius 1.5 miles)
AS-10 NLT	West Northwest of GGNS, located at Newellton, Louisiana (Sector P Radius 12.5 miles)
AS-11 STJ	West Southwest of GGNS, located at St. Joseph, Louisiana (Sector M Radius 13.0 miles)

*GGNS Technical Specification requirements

**Standard Technical Specification requirements

2.2 THERMOLUMINESCENT DOSIMETRY (TLD)

Direct radiation in the environment surrounding GGNS is measured with 87 TLD badges. Maps showing the location of the environmental TLDs are provided as Figures 2-1 through 2-3.

Each dosimeter has five TLD chips sealed in a plastic protective holder. The holder is suspended approximately 1 meter above the ground at each location. The dosimeters are collected quarterly, with notations made concerning location, exposure period, and any abnormal conditions such as moisture and damage.

The 87 TLD locations are defined in Table 2-2. The criteria used in selecting their locations are summarized below:

- o GGNS Technical Specification 4.12.1 requires 40 of the 87 TLDs to be positioned as outlined below:
 - An inner ring of 16 stations in the general area of the site boundary with one TLD in each meteorological sector
 - An outer ring of 16 stations in the 4 to 5 mile range with one TLD in each meteorological sector
 - 8 TLDs located in special interest areas such as population centers and residences or utilized as controls.
- o Permanent TLD stations are established on the protected area fence surrounding Unit 1. This requires 24 of the 87 TLDs.
- o The remaining 23 TLDs are located in areas ranging from 0-15 miles away from the GGNS site. These TLDs are used to gather supplemental and supporting data for determining direct radiation dose.

TABLE 2-2
TLD LOCATIONS

<u>TLD NO.</u>	<u>LOCATION</u>	<u>SECTOR</u>	<u>MILE</u>
*M-00	Maintained in Lead Shield During the Exposure Period		
*M-01	REA Pole-East of Entry Gate at Lake Claiborne	E	3.5
M-02	REA Pole Left of Windsor Ruins Entry Gate	L	7.0
M-03	REA Pole-East Side Hwy 61 P.G. Country Club Entrance	H	7.0
M-04	MP&L Pole-Hwy 547 North Side Between Twin Power Poles	G	6.5
M-05	North of Hwy 18 Approximately 5 miles East of U. S. 61	F	9.0
M-06	REA Pole-East of Willows Beyond MMB Church, MS Highway 462	E	8.0
*M-07	Port Gibson City Barn, AS-1	G	5.5
M-08	West Side Big Black River South Entrance	C	8.5
*M-09	Oak Tree Hanger-South Warner Tully Camp	D	3.5
*M-10	Entrance Gate Grand Gulf Military Park	R	1.5
M-11	Highway 61 3 Miles North of Big Black River at Twin Tower	C	10.5
M-12	Highway 61 at AS-2-61 North Yokena	B	13.0
M-13	Highway 61 LeTourneau Hill West Side of Road	B	15.0
*M-14 (CONTROL)	Highway 61 AS-3-61VA at Casket Company	B	18.0
M-15	Barge Slip (South Edge)	P	1.5
*M-16	AS-7-MET Tower	A	0.8
M-17	AS-6-RS Grand Gulf Road	C	0.5
*M-18	Railroad Crossing Eastern Site Boundary	F	0.5

*Technical Specifications requirement

TABLE 2-2 (cont'd)
TLD LOCATIONS

<u>TLD NO.</u>	<u>LOCATION</u>	<u>SECTOR</u>	<u>MILE</u>
M-19	Behind Burn Pit on Fence at Eastern Site Boundary	E	0.5
M-20	Eastern Site Boundary Behind Hazardous Waste Storage Area	F	0.5
M-21	AS-5-TC Training Center	J	0.4
M-22	100 Yards South of RR Entrance on West Side	G	0.5
M-23	50 Yards North of County Road/Heavy Haul Road Intersection on Power Pole	Q	0.5
M-24	Upper Grand Gulf Landing	R	2.2
*M-25	Hamilton Lake Boat Launch	N	1.0
M-26	Hamilton Lake Outfall	N	1.5
*M-27	South Point Site Boundary 200 Yards along Property Line	M	1.5
*M-28	AS-4-GJOE Glodjo Residence	L	0.9
M-29	In sharp curve of Waterloo Road to Waterloo Plantation	K	1.5
*M-30	Arnold Acres Trailer Park Entrance	J	1.1
M-31	Duplicate TLD Installed at Designated Site Number		
M-32	Duplicate TLD Installed at Designated Site Number		
*M-33	Newellton, Louisiana Water Tower	P	12.5
*M-34	Primary Levee at End of Country Road at Point Pleasant, Louisiana	R	8.0
*M-35	Mor Landing - Lake Yucatan	Q	8.0
*M-36	Curve on 608 Point Nearest GGNS, at Power Pole	P	5.0

*Technical Specifications requirement

TABLE 2-2 (cont'd)
TLD LOCATIONS

<u>TLD NO.</u>	<u>LOCATION</u>	<u>SECTOR</u>	<u>MILE</u>
M-37	Winter Quarters Home	N	8.0
*M-38	Lake Bruin State Park Second Pole	M	9.5
*M-39	St. Joseph, Louisiana, Aux. Water Tank	M	13.0
*M-40	International Paper Road, Approximately 5 miles from Site	M	5.0
*M-41	Heavy Haul Road---J Pipe on Concrete Block	P	1.0
*M-42	Heavy Haul Road North Iron Gate	Q	1.0
*M-43	Gin Lake Entrance	R	1.2
*M-44	Truck Bypass on Grand Gulf Road	C	0.5
*M-45	Visitor Center Gate East Side	D	0.5
*M-46	Power Pole Across from Grand Gulf/ Waterloo Roads Intersection	E	1.0
*M-47	Bridge 0.6 miles past Rodney Road/ Greenwood Road intersection North Side	L	5.2
*M-48	Property Line Fence 0.4 miles on Greenwood Road on West Side	K	4.8
*M-49	Fork in Weathers Road	H	4.5
*M-50	Panola Hunting Club Entrance Sign	B	5.5
*M-51	Power Pole 0.5 miles on Gravel Road to Big Black on West Side	C	4.8
*M-52	Power Pole-Waterloo Road Marked with White Paint	K	1.0

*Technical Specifications requirement

TABLE 2-2 (cont'd)
TLD LOCATIONS

<u>TLD NO.</u>	<u>LOCATION</u>	<u>SECTOR</u>	<u>MILE</u>
*M-53	Arnold Acres Property Fence Past Old Trailer Park	H	1.1
*M-54	Bottom of Curve Past Arnold Acres	G	1.0
*M-55	Behind Bonner's Beauty Shop at MSBH Air Sampler	D	5.0
*M-56	Hwy. 61 South at "All Creatures Veterinary Hospital"	G	5.0
*M-57	Highway 61 North Behind the Welcome to Port Gibson sign	F	4.5
*M-58	Big Bayou Pierre Bridge Southwest End	E	5.0
*M-59	Off Levee at Winter Quarters Hunting Camp	N	5.1
M-60	Duplicate TLD		
M-61	Protected area fence by the vehicle entrance gate	P	Onsite
M-62	Protected area fence Northeast corner MP&L parking lot	N	Onsite
M-63	Protected area fence middle MP&L parking lot	N	Onsite
M-64	Protected area fence Southeast corner MP&L parking lot	M	Onsite
M-65	South protected area fence behind MP&L warehouse	L	Onsite
M-66	South protected area fence across from cooling tower	K	Onsite
M-67	South protected area fence East end	J	Onsite
M-68	East protected area fence across from chlorination tank	H	Onsite

*Technical Specifications requirement

TABLE 2-2 (cont'd)
TLD LOCATIONS

<u>TLD NO.</u>	<u>LOCATION</u>	<u>SECTOR</u>	<u>MILE</u>
M-69	East protected area fence near electric Buss	G	Onsite
M-70	North fence behind turbine building	F	Onsite
M-71	133' Railway Bay	C	Onsite
M-72	133' Railway Bay	B	Onsite
M-73	Corner of fence outside Control Building	P	Onsite
M-74	Midway of North fence	P	Onsite
M-75	Corner in fence in front of Maintenance Shop	A	Onsite
M-76	Southeast corner SSW Basins	A	Onsite
M-77	Protected area fence beside Maintenance Shop	R	Onsite
M-78	Outside vault in Administration Building	Q	Onsite
M-79	Wall in Central Records	Q	Onsite
M-80	Wall in Central Records Old Library location	Q	Onsite
M-81	Inside Administration Building, 2nd floor, northeast wall	Q	Onsite
M-82	Tech Support Area	Q	Onsite
M-83	Tech Support Secretary's Office	Q	Onsite
M-84	Security Island	P	Onsite
M-85	Rotating duplicate		
*M-86	Bechtel Gate North Site Boundary	B	0.5
*M-87	Intersection of Rodney Road & Transmission Line	J	3.5

*Technical Specifications requirement

Recapping, the TLD locations may be categorized as follows:

	<u>No. of Locations</u>
o Technical Specifications requirement	
- Inner Ring	16
- Outer Ring	16
- Population Centers & Controls	8
o Protected Area Fence	24
o Supplemental Data (0-15 miles)	23
	<hr/>
Total	87

2.3 MILK SAMPLES

Milk samples are collected in the vicinity of GGNS for the purpose of measuring radioactivity via the ingestion exposure pathway.

GGNS Technical Specifications require semimonthly milk sampling at three locations within five kilometers of the site and one control sample (15-30 kilometers from site) when the animals are on pasture and monthly at other times. No milking animals are available within the five kilometer range. A control sample is collected routinely from the Alcorn State University Dairy. On occasion samples are available from three area farmers (Figure 2-2, Table 2-3).

Collected raw milk is divided and analyzed for Iodine-131 and gamma-emitting radionuclides.

TABLE 2-3
MILK & WATER SAMPLING LOCATIONS

MILK SAMPLES

Alcorn State University*	Southwest of GGNS (Sector K, Radius 10.5 miles)
Rosco Johnson Farm	Southeast of GGNS (Sector G, Radius 9 miles)
Hazetta Warren Farm	In Louisiana West Northwest of GGNS (Sector N, Radius 8.5 miles)
Mack Bell Farm	East of GGNS (Sector E, Radius 8.0 miles)

CISTERN WATER

Trimble Cistern*	East of GGNS at the Trimble Tenant House (Sector E, Radius .5 miles)
Willis Cistern*	The C. E. Willis house East Northeast of GGNS across from the Shiloh Baptist Church (Sector D, Radius 6 miles)

GROUNDWATER

PGWELL*	Port Gibson Well - Taken at Port Gibson City Water Lift Station (Sector G, Radius 5.0 miles)
GGMPWELL	Grand Gulf Military Park - Taken from faucet at the Grand Gulf Military Park (Sector A, Radius 1.5 miles)
TRIMWELL*	Trimble house faucet (Sector E, Radius 0.7 miles)
LAKE BRUIN	Take from faucet at the bath house in Lake Bruin State Park, Louisiana (Sector M, Radius 9.5 miles)

*Technical Specifications requirement

TABLE 2-3 (cont'd)

SURFACE WATER

Upstream*	Approximately 4500 ft upstream of the GGNS barge slip to allow adequate mixing of the Mississippi and Big Black Rivers (Sector Q)
Downstream*	Approximately 5000 ft downstream of GGNS barge slip, near Radial Well #1 (Sector N)
Discharge Basin*	West of GGNS, 0.5 miles (Sector P)

*Technical Specifications requirement

2.4 WATER SAMPLES

Water samples are collected in the vicinity of GGNS for the measurement of radioactivity in the waterborne exposure pathway. Samples are collected in clean, labelled 2.5-gallon containers. The containers are rinsed with the sample media prior to collection.

Cistern water is sampled monthly at two locations, one near the site (Trimble Cistern) and the other at a control location (Willis Cistern) (Figure 2-1, Table 2-3). Cistern water is analyzed for gross beta, Iodine-131 and gamma-emitting radionuclides. In addition, a quarterly composite is analyzed for tritium.

Groundwater is sampled at four locations. The locations fulfilling the Technical Specifications are the source nearest the site (Trimble Well) and the control (Port Gibson City Well). The other two locations provide GGNS with additional data (Figures 2-1 and 2-2, Table 2-3). Groundwater is collected and analyzed quarterly for gamma-emitting radionuclides and tritium.

Surface water samples from the Mississippi River are collected monthly at a point upstream and downstream of the plant discharge (Figure 2-4, Table 2-3). They are analyzed monthly for gamma-emitting radionuclides and a composite is analyzed quarterly for tritium.

Another surface water sample is taken from the plant discharge basin. Samples are composited monthly from samples taken at hourly intervals with an automatic sampler. This sample is analyzed for gamma-emitting radionuclides monthly and a composite is analyzed quarterly for tritium.

2.5 BROADLEAF VEGETATION

Broadleaf vegetation samples are collected in the vicinity of GGNS for the purpose of measuring radioactivity via the ingestion exposure pathway. Three samples of broadleaf vegetation grown near the site boundary (Figure 2-1, Table 2-4) in the area with the highest anticipated annual average ground-level D/Q are required when milk samples are not available within five kilometers of the site boundary. Control samples of each of the similar types of vegetation collected near the site are collected 15-30 kilometers from the site.

The preferred source of broadleaf vegetation is green leafy vegetables suitable for human consumption. If such vegetables are not available, samples of any vegetation with relatively broad leaves on which airborne radioactive material might be deposited are sampled. The raw samples are then analyzed for gamma-emitting radionuclides.

2.6 SEDIMENT SAMPLES

Sediment samples are collected semiannually at the river shoreline where the plant effluent is discharged and downstream of this discharge in the vicinity of the Hamilton Lake Outfall (Figure 2-1, Table 2-4). Sediment samples are collected in the shallow water near the shoreline from the top one inch layer of sediment. Any foreign objects are discarded and the samples are placed in a sample container with location and date noted. The samples are then analyzed for gamma-emitting radionuclides including Cesium-137.

TABLE 2-4

VEGETATION, FISH, & SEDIMENT SAMPLING LOCATIONS

VEGETATION

Broadleaf Vegetation*	South of GGNS in the MP&L garden near the training center (Sector J, 0.4 miles)
Vegetation Control*	Guider Farm (Sector B, 30 km)

FISH SAMPLES

Catfish*	Downstream of the discharge point in the Mississippi River. Upstream of Discharge Point uninfluenced by Plant Operations.
----------	--

SEDIMENT SAMPLES

SED HAM*	Collected semiannually during the low water periods of the Tidal Basin - samples taken downstream of the outfall in the vicinity of the boat landing near Hamilton Lake outlet and in the Barge Slip (Sector N, Q)
SED BAR*	
SED CONT	Collected upstream from barge slip at Upper Grand Gulf Landing (Sector R)

*Technical Specifications requirement

2.7 FISH SAMPLES

Fish are collected semiannually from two locations. The control fish sample is collected in the Mississippi River about 1000 yards upstream from the GGNS barge slip. The indicator sample is collected approximately 6000 feet downstream from the barge slip. A minimum of 1000 grams (wet weight) of eviscerated fish is collected from each location (Figure 2-1, Table 2-4) and analyzed for gamma-emitting radionuclides.

2.8 SPECIAL SAMPLES

Special samples are occasionally taken of sampling media or locations which are not part of the routine Environmental Surveillance Program. These include such items as fruits and vegetables. In addition, duplicate samples are periodically taken for water, milk and vegetable sample media. These serve as quality control checks.

Samples of deer meat are obtained on an annual basis from deer harvested on or adjacent to the GGNS site by members of the GGNS Bow Hunting Club or adjacent hunting clubs. The meat is then analyzed for gamma-emitting radionuclides, particularly Iron-59 and Zinc-65.

2.9 ANNUAL LAND USE CENSUS

As required by GGNS Technical Specification 3.12.2, MP&L conducted an Annual Land Use Census from August 31, 1983-September 2, 1983. The purpose of this census was to identify changes in the uses of land in the unrestricted areas surrounding GGNS which would require modifications to the Environmental Surveillance Program or the Offsite Dose Calculation Manual

(ODCM). The most important criteria during the census were to determine the locations of the nearest permanent resident and the nearest animal milked for human consumption. Other items noted during the census were the population in each section, the number and locations of expectant mothers, gardens, rabbits, and poultry.

SECTION 3
ANALYTICAL PROCEDURES & COUNTING METHODS

3.1 ANALYTICAL PROGRAM AND METHODOLOGY

Samples are analyzed for the various radioactive components by standard radiochemical methods. Those methods are equal to and in most cases identical with those of the USDOE (HASL Procedures Manual, HASL-300, Health and Safety Laboratory, U. S. Atomic Energy Commission, 376 Hudson Street, New York, New York 10074), or those of the U. S. Environmental Protection Agency (EPA). The analytical program is summarized in Table 3-1.

3.2 ANALYTICAL DETECTION LIMITS AND COUNT RATE ERRORS

In environmental radiological analyses the dominant known uncertainty is usually the sample count rate. Error terms given in this report are based on this factor since all other analytical uncertainties are calculated by standard methods and are reported at the 95 percent (2 sigma) confidence level. Analytical data for samples for which concentrations are less than the Lower Limit of Detection (LLD) are preceded by the symbol "<". The sample types, analyses performed, and units of the measurements along with the corresponding LLD, are presented in Table 3-2.

3.3 AIR PARTICULATES

Gross beta concentrations are measured with low background gas flow (proportional and/or Geiger) counting systems with anti-coincidence background suppression after the short-lived naturally occurring radon and thoron daughters have decayed. The filters are counted long enough to ensure that the required sensitivity (LLD) is met. The routine LLD is 0.01 pCi/m^3 for gross beta based on about $300 \text{ m}^3/\text{week}$ of air volume.

TABLE 3-1
ANALYTICAL PROGRAM

<u>SAMPLE PARAMETER</u>	<u>FREQUENCY</u>	<u>ANALYSIS</u>
Air Particulates	Weekly	Gross Beta ⁽¹⁾
	Quarterly	Gamma Isotopic
Airborne Iodine	Weekly	Iodine-131
Thermoluminescent Dosimetry (TLD)	Quarterly	Radiation Dose
Milk	Monthly ⁽²⁾	Iodine-131
		Gamma Isotopic
Broadleaf Vegetation	Monthly ⁽³⁾	Gamma Isotopic
Sediment	Semiannually	Gamma Isotopic
Groundwater	Quarterly	Gamma Isotopic
	Quarterly	Tritium
Cistern Water	Monthly	Iodine-131 Gamma Isotopic Gross Beta
	Quarterly Composite	Tritium
Surface Water	Monthly ⁽⁴⁾	Gamma Isotopic
	Quarterly Composite	Tritium
Fish	Semiannually	Gamma Isotopic
Meat	Annually	Gamma Isotopic

(1) If gross beta activity of any filter is found to be greater than ten times the yearly mean of gross beta for the control (AS#3) then a gamma isotopic analysis is performed on the filter.

(2) Twice a month when animals are on pasture.

(3) Broadleaf vegetation sampling is performed monthly when available and when milk sampling is not performed within 5 km.

(4) The composite discharge basin water sample is utilized for gamma isotopic analysis.

TABLE 3-2

LOWER LIMITS OF DETECTION (LLD)

<u>SAMPLE TYPE</u>	<u>ANALYSIS</u>	<u>LLD*</u>	<u>UNITS</u>
Air Particulate	Gross Beta Gamma Isotopic	0.01	pCi/m ³
Airborne Iodine	I-131	0.07	pCi/m ³
Cistern Water	Gross Beta	1	pCi/l
	I-131	1	pCi/l
	Gamma Isotopic	15	
	Tritium	330	pCi/l
Surface Water	Gamma Isotopic	15	pCi/l
	Tritium	330	pCi/l
Groundwater	Gamma Isotopic	15	pCi/l
	Tritium	330	pCi/l
Milk	I-131	1	pCi/l
	Gamma Isotopic	15	pCi/l
Sediment	Gamma Isotopic	150	pCi/kg
Fruits & Vegetables	Gamma Isotopic	80	pCi/kg
Fish & Meat	Gamma Isotopic	130	pCi/kg
TLD	Total Dose	1	mrem/qtr

*LLDs are as identified in GGNS Technical Specifications

Gamma isotopic analyses of the quarterly composite samples are performed with a Ge(Li) detector with a routine LLD of 0.01 pCi/m³.

3.4 RADIOIODINE

The charcoal cartridges used are of the TEDA-impregnated type. The radioiodine is extracted from the charcoal, chemically separated, and counted as AgI using wide beta or low beta counters. The LLD is 0.07 pCi/m³.

3.5 CISTERN WATER

Gross beta analysis of cistern water is performed by evaporation of a measured aliquot of the sample, digestion, planchetting of the processed sample, and radiometric assay by low-level beta counting. The LLD is 1 pCi/liter. Iodine-131 analysis is based on anion exchange removal of the I-131 from a known sample volume. The iodine is eluted from the resin with NaOCl which also oxidizes it to the iodate. The iodate is reduced to iodine with hydroxylamine in 3N nitric acid solution. The iodine is extracted into carbon tetra chloride, reduced to iodide with sodium bisulfite, extracted into water and precipitated as AgI. The sample is filtered, dried, weighed and beta counted. The LLD is 1 pCi/liter.

Gamma isotopic analysis is performed by taking a measured aliquot of the preconcentrated sample and counting it in a standard geometry in a high resolution (GeLi) gamma spectrometer long enough to meet the sensitivity (LLD) of 15 pCi/liter.

Tritium analysis is performed on the quarterly composite of the samples collected monthly. The sample is isotopically enriched in tritium concentration prior to liquid scintillation counting. The isotopic enrichment is done by the classical method of Ostlund which involves alkaline electrolysis of a purified aliquot sample under controlled conditions of temperature and electrode current density.

3.6 SURFACE WATER

The samples collected monthly are analyzed by gamma spectrometry as described in Section 3.5 under Cistern Water. The quarterly composite sample of the monthly collections is analyzed for tritium by the electrolytic enrichment technique described in Section 3.5 under cistern water.

3.7 GROUNDWATER

The samples collected quarterly are analyzed for gamma-emitting radionuclides and tritium as described in Section 3.5 under Cistern Water.

3.8 MILK SAMPLES

I-131 analysis is performed on the milk samples collected monthly. The method used is same as given in Section 3.5 under Cistern Water.

Gamma isotopic analysis is performed as follows: A measured aliquot of the sample is evaporated and oven dried. The dried sample is pulverized and counted in a calibrated geometry in a high resolution Ge(Li) gamma spectrometer for a long enough period to achieve the required LLD of 15 pCi/liter.

3.9 SEDIMENT SAMPLES

The sediment sample is oven-dried and then sieved (if required) to remove stones and/or other large pieces of material. An appropriate sized and weighed aliquot is then transferred into a standard geometry container and counted in a high resolution Ge(Li) gamma spectrometer for a long enough period to achieve the required LLD of 150 pCi/kg (dry).

3.10 FRUIT & VEGETABLE SAMPLES

Measured amounts of the oven-dried sample are transferred into a standard geometry container and counted in a high resolution Ge(Li) gamma spectrometer for a long enough period to meet required LLD of 80 pCi/kg (wet).

3.11 FISH & MEAT

A measured amount of the oven-dried samples are transferred into a standard geometry container and counted in a high resolution Ge(Li) gamma spectrometer for a long enough time to meet the required LLD of 130 pCi/kg (wet).

3.12 THERMOLUMINESCENT DOSIMETERS (TLDs)

Environmental radiation doses are measured using badges comprised of five chips sealed in plastic protective holders having a density of about 50 mg/cm². The TLD chips are 1/8" x 1/8" x 1/32" LiF (thallium activated) known commercially as Harshaw TLD-100. The chips are all selected to provide uniform responses. Prior to installation, the chips are annealed by a standard cycle of 60 minutes of 400°C and immediate cooling to ambient temperature by placing the tray containing the annealed chips on an aluminum block.

After exposure the chips are read on an Eberline Instrument Corporation Model TLR-6 reader. The system employs a preheat cycle which removes low temperature peaks and integrates and digitizes only the light output in a selected temperature range.

The dose is calculated from the average light output for the five readings. Control badges are used to detect any unusual exposure to the badge which might occur during shipment. The LLD for environmental TLDs is 1 mrem/quarter.

SECTION 4
RESULTS AND DISCUSSION

4.1 AIR PARTICULATES AND AIRBORNE I-131

The gross beta particulate data obtained during 1983 remained at low levels. The levels in general were in the range to be expected from measurements of this type in this medium.

The average gross beta concentration for the year for all indicator and background locations was 0.02 pCi/m^3 . Data for analyses of individual filters is provided on pages 7-4 through 7-10.

Airborne Iodine-131 concentrations were less than 0.07 pCi/m^3 for all samples received.

The gamma spectrometry data for the quarterly composites of air particulates is presented on page 7-11.

4.2 AMBIENT RADIATION LEVELS (GAMMA DOSE BY TLD)

Gamma radiation dose was measured with Thermoluminescent Dosimeters (TLDs) on a quarterly schedule. Throughout the year, there was no statistically significant difference in dose rates between indicator and background locations, nor do they differ significantly from dose rates measured in previous years. The 1983 TLD data is presented on pages 7-12 to 7-14.

4.3 MILK

Milk samples were collected monthly and analyzed for Iodine-131 and gamma emitters. Iodine-131 and gamma isotopic concentrations for samples analyzed were below the LLD. This is generally consistent with data from previous years. The data is presented on page 7-15.

4.4 WATER

Environmental Surveillance Program personnel sampled cistern water, surface water and groundwater as required during 1983.

Analysis results were similar to those reported for previous years.

Cistern Water

Cistern water samples were collected from two locations and analyzed for gross beta, Iodine-131 and gamma-emitting radionuclides.

The gross beta concentrations for the indicator stations were in the range of 1 to 10 pCi/l with an average value of 4.2 pCi/l and for the background stations were in the range of 1 to 5 pCi/l with an average of 2.4 pCi/l. Measured levels were in the range to be expected from measurements of the type in the medium.

The I-131 and gamma-emitting radionuclides concentrations were below the LLD.

Tritium measurements were made on quarterly composites. Tritium levels were at or above the LLD and were in the range to be expected from measurement of this type in this medium.

All data collected for cistern water is provided page 7-16.

Surface Water

Surface water samples were collected monthly and analyzed for gamma-emitting radionuclides. Quarterly composites were analyzed for tritium.

Gamma isotopic concentrations were below the detectable level of the program for all samples analyzed.

Tritium levels were at or below the detectable level of the program.

Data is presented on page 7-17 and 7-18.

Groundwater

Groundwater samples were collected quarterly and analyzed for gamma-emitting radionuclides and tritium.

The gamma-emitting radionuclides and tritium levels were below the LLD. The data is presented on page 7.19.

4.5 VEGETATION

Fruits and vegetables were collected when available and analyzed for gamma-emitting radionuclides. Gamma isotopic concentrations measured were below the LLD. Results from previous years were also at very low to nondetectable levels. The data is given on pages 7.20 and 7-21.

4.6 SEDIMENT

Sediment samples were collected semiannually and analyzed for gamma-emitting radionuclides. The radioactivity observed in these samples was typical in type and concentration to that expected from natural fallout, and cosmogenic origins. Cesium-137 was detected in the range of 0.2 to 0.4 pCi/g (wet), in three out of five samples. The activity apparently originated from fallout origin and was not attributable to plant operations.

Previous samples collected during the Preoperational and Operational Environmental Surveillance Program have yielded similar results. The data is presented on page 7-22.

4.7 FISH

Fish samples were collected semiannually and analyzed for gamma-emitting radionuclides. The gamma isotopic levels were below the LLD, as has been the case in previous years. The data is presented on page 7-23.

4.8 SPECIAL AND OPTIONAL SAMPLES

Three special samples (one fish and two water samples) were collected during the year and analyzed for gamma-emitting radionuclides. All three samples were below the detectable limit for gamma-emitting radionuclides. The data is presented on page 7-24.

Two types of optional samples collected during 1983 are discussed below:

- o Meat - A venison sample collected on December 7, 1983, at the Buck Snort Hunting Camp (Sector N, 1.8 miles) was negative for gamma-emitting radionuclides. The data is presented on page 7-23.
- o Soil Samples - Soil samples were collected at three of GGNS's air sampling locations (AS-4, AS-10, AS-11), which had not been previously sampled. Gamma emitters were not present, but Cs-137 was present in the two samples collected at Louisiana locations. Cesium-137 concentration at the Louisiana locations was directly related to soil depth indicating radioactive fallout. The data is presented on page 7-25.

The fact that Cs-137 was not present in one of the soil samples is most likely related to the sampling location. This sample was collected from an old garden site where the soil had been disturbed as a result of cultivation. Erosion and mixing of the soil caused by cultivation had reduced the concentration of Cs-137 by mixing the upper layers contaminated by fallout with the unaffected lower layers.

4.9 LAND USE CENSUS

In order to obtain the most accurate population and land use information, a door-to-door survey was conducted in the 0-5-mile zone. This survey covered the entire 5-mile zone with the exception of Sector G inside the Port Gibson City Limits. Residents who were not home during the census were left a mail-in form. Those households which did not return the mail-in forms were projected to have one person in the 20-60 age group residing

there. This consisted of 5.3% of the total population. Supplemental information in the 0-2-mile zone was provided by the Claiborne County Civil Defense Office for use as a cross check. In the 5-10-mile zone the Mississippi and Louisiana Agricultural Extension Agents were contacted concerning the presence of milking animals and a survey of the area was conducted by automobile to locate any milking animals.

The results of the 1983 Land Use Census are outlined below:

Population Distribution

- o The door-to-door survey in the 0-5-mile zone indicated that there were 890 individuals residing in this area. Table 4-1 divides the population into age groups and sector location and Figure 4-1 outlines the results of the population survey on a 5 mile map.
- o The nearest resident remained the same as outlined in the 1982 Land Use Census at 982 meters in the East, Sector E.
- o Three expectant mothers were located in the 3-5-mile zone. None were located in the 0-2-mile zone.

Garden Survey

- o The number of gardens in the 0-2-mile zone doubled over the number identified in the 1982 Census.
- o A total of 96 gardens were located in the 0-5-mile zone. The distribution of these gardens is plotted on a 5-mile map (Figure 4-2).
- o Commercial production of green leafy vegetables remained the same as in the 1982 Census (Sector E at 6487 meters).
- o The nearest garden remained the same as in the 1982 Land Use Census at 1432 meters in the Southwest, Sector L.

Milking Animals

- o The milking animal identified in the 1982 Land Use Census located at 11,265 meters in the West, Sector N, is no longer available for sampling.

TABLE 4-1

RESIDENT POPULATION DISTRIBUTION

RADIAL DISTANCE	SECTOR AGES (YRS)	A	B	C	D	E	F	G	H
0 - 1	(MI.) <2	1	1	0	0	0	0	0	0
	2 - 12	1	1	0	0	1	0	0	0
	13 - 19	0	4	0	0	0	1	0	0
	20 - 60	5	3	2	0	7	0	0	0
	>60	1	0	0	0	5	1	0	0
1 - 2	<2	0	1	1	0	0	0	0	0
	2 - 12	5	1	1	0	1	0	1	0
	13 - 19	0	0	0	0	2	0	0	0
	20 - 60	7	2	2	0	8	0	3	2
	>60	4	0	1	0	3	0	3	1
2 - 3	<2	1	0	0	1	1	0	0	0
	2 - 12	0	0	0	6	17	0	0	0
	13 - 19	0	0	0	2	6	0	0	0
	20 - 60	11	2	0	5	14	0	0	0
	>60	2	0	0	1	1	0	0	0
3 - 4	<2	0	0	0	0	5	0	2	0
	2 - 12	0	0	0	1	8	0	15	3
	13 - 19	0	0	0	1	1	0	2	0
	20 - 60	0	0	3	1	54	0	25	3
	>60	0	0	0	2	16	0	9	0
4 - 5	<2	0	0	5	0	0	10	3	0
	2 - 12	0	0	15	1	0	56	18	6
	13 - 19	0	0	8	7	2	21	8	7
	20 - 60	0	0	17	15	61	164	30	20
	>60	0	0	11	7	2	42	12	13

TABLE 4-1 (cont'd)

RESIDENT POPULATION DISTRIBUTION

RADIAL DISTANCE	SECTOR AGES (YRS)	J	K	L	M	N	P	Q	R
0 - 1	<2	0	0	0	0	0	0	0	0
	2 - 12	0	0	1	0	0	0	0	0
	13 - 19	0	0	0	0	0	0	0	0
	20 - 60	0	0	2	0	0	0	0	0
	>60	0	0	2	0	0	0	0	0
1 - 2	<2	0	0	0	0	0	0	0	0
	2 - 12	0	0	0	0	0	0	0	2
	13 - 19	0	0	0	0	0	0	0	0
	20 - 60	0	0	0	0	0	0	0	3
	>60	0	0	0	0	0	0	0	1
2 - 3	<2	0	0	0	0	0	0	0	0
	2 - 12	3	0	0	0	0	0	0	0
	13 - 19	0	0	0	0	0	0	0	0
	20 - 60	4	0	0	0	0	0	0	0
	>60	0	0	0	0	0	0	0	0
3 - 4	<2	0	0	0	0	0	0	0	0
	2 - 12	0	0	0	0	0	0	0	0
	13 - 19	0	0	0	0	0	0	0	0
	20 - 60	0	0	0	0	0	0	0	0
	>60	2	0	0	0	0	0	0	0
4 - 5	<2	0	0	0	0	0	0	1	0
	2 - 12	0	0	0	0	0	0	2	0
	13 - 19	0	0	0	0	0	0	0	0
	20 - 60	0	0	0	0	0	0	2	0
	>60	0	0	0	0	0	0	0	0

FIGURE 4-1

Population Distribution

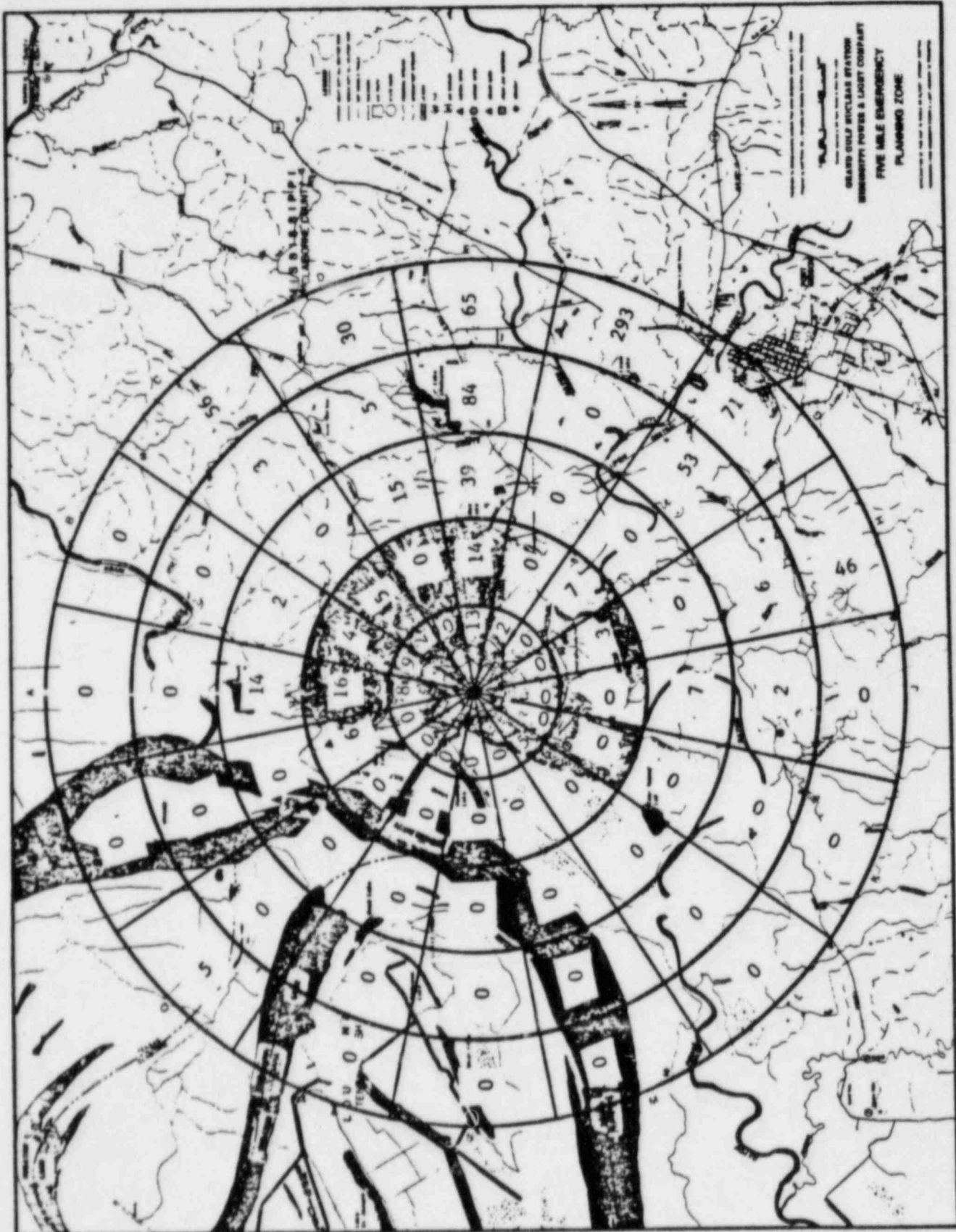
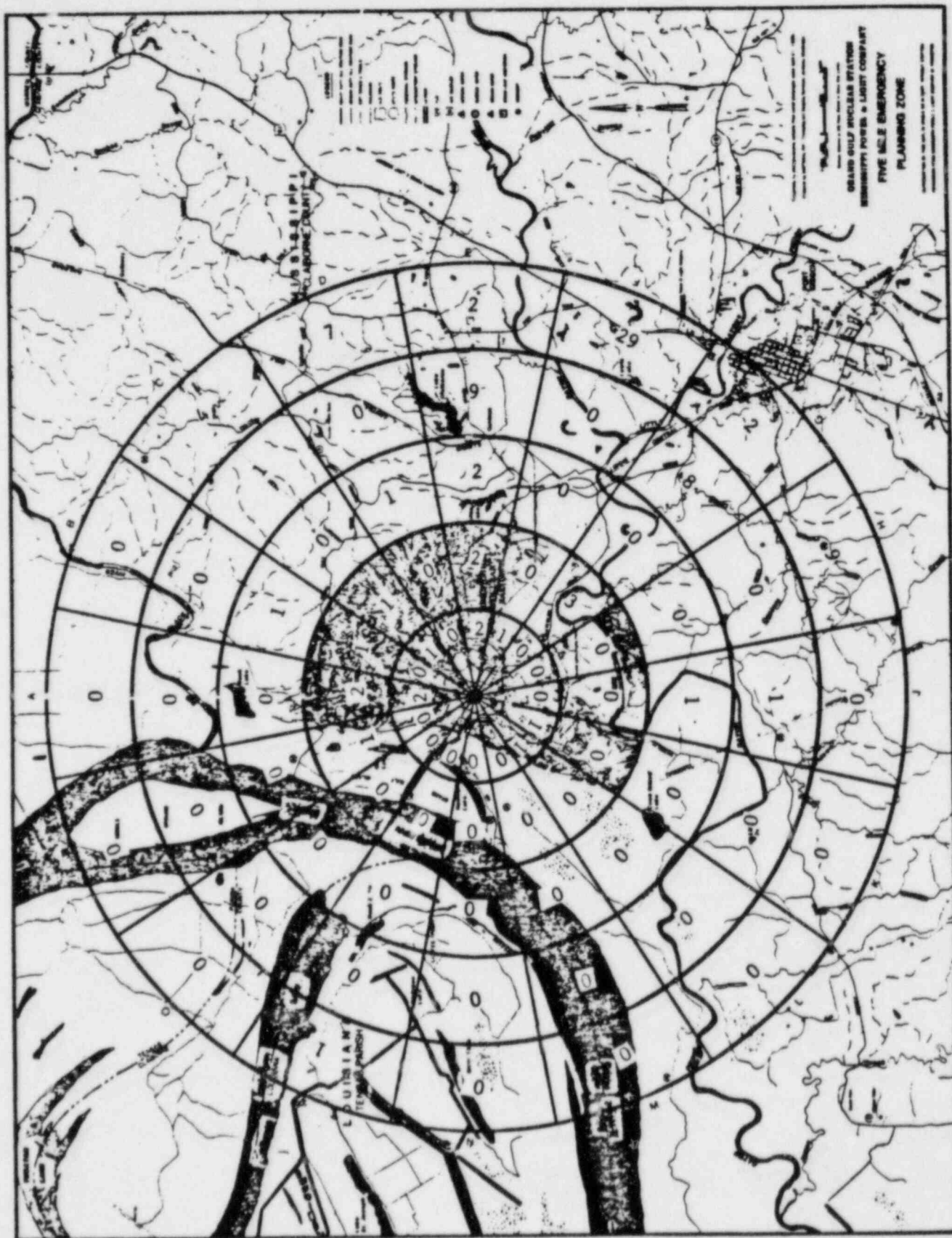


FIGURE 4-2

Garden Distribution



- o A new milking animal was identified at 12,903 meters in the East, Sector E (Mack Bell Farm). Samples are obtained when available since the animal is milked on a temporary basis.
- o The nearest milking animal milked on a permanent basis remained the same as in the 1982 Census at 13,629 meters in the Southeast, Sector G (Roscoe Johnson Farm).

Meat Production

- o A number of residents in the 0-10-mile zone raised chickens, quail and rabbits for human consumption on an individual basis.

In conclusion, the results of the 1983 Land Use Census indicated that the agricultural uses of land in the 0-10-mile zone surrounding GGNS have remained basically the same as those reported in the GGNS Final Environmental Report. Although some changes were identified in the types of crops grown, those areas which were utilized for agricultural production in the GGNS Final Environmental Report have remained as such. The population and garden use information provided in the 1983 Land Use Census indicated substantial changes in the information provided in the GGNS Final Environmental Report and the ODCM Table 2.2.3, "Controlling Receptors, Locations, and Pathways". A revised copy of this table is provided in Table 4-2 and the ODCM has been revised accordingly.

TABLE 4-2

CONTROLLING RECEPTORS, LOCATIONS, AND PATHWAYS

Sector	Distance (Meters)	Pathway	Age Group	Origin
N	1207	Vegetation	Infant	garden
NNE	1207	Inhal/Grd Plane	Infant	residence
NE	2414	Inhal/Grd Plane	Infant	residence
ENE	4023	Vegetation	Child	garden
E	4023	Vegetation	Infant	garden
ESE	1207	Inhal/Grd Plane	Teenager	residence
SE	2414	Vegetation	Child	garden
SSE	2414	Vegetation	Adult	garden
S	4023	Inhal/Grd Plane	Child	residence
SSW	3218	Inhal/Grd Plane	Infant	hypothetical
SW	1432	Vegetation	Child	garden
WSW	8047	Cow/Milk	Infant	hypothetical
W	8047	Cow/Milk	Infant	hypothetical
WNW	7242	Inhal/Grd Plane	Infant	residence
NW	8047	Cow/Milk	Infant	hypothetical
NNW	2414	Inhal/Grd Plane	Child	residence

Table based on 1983 Land Use Census

4.10 EXCEPTIONS TO THE ENVIRONMENTAL SURVEILLANCE PROGRAM

4.10.1 Discharge Basin (surface water)

- o The automatic composite sampling system capable of taking samples at one-hour intervals, as required by GGNS Technical Specification 3.12.1, was not available until February 7, 1983. Prior to February 7, 1983, grab samples were taken at 8-hour intervals.
- o The sampling pump lost prime on April 4, 1983. The pump was primed and sampling resumed on the same day.
- o A breaker tripped at 2300 hours on April 28, 1983, causing loss of power to a sampler. Approximately ten hours of sampling was missed. This problem was corrected and sampling resumed April 29, 1983, at approximately 0900 hours.
- o On December 21, 1983, the intake line clogged and samples could not be collected using the composite sampling system. Eight-hour grab sampling was resumed until January 25, 1984, when the composite sampling system became operable.
- o The Plant Service Water System was shut down on two occasions in 1983 for maintenance; therefore, for three days in June and three days in December no discharge nor composite samples were collected.

4.10.2 Milk

- o Semimonthly milk samples were not collected as required by Table 3.12.1-1 of GGNS Technical Specifications during the months of June, July, August, September and October, 1982. The Technical Specifications requirement for semimonthly milk sample collection was not immediately recognized when GGNS became operational in June, 1982. This requirement has been satisfied, with one exception, since November, 1982. Future problems of this nature are not anticipated.
- o The December, 1983, semimonthly sample from the Alcorn State University dairy was not collected during the school's Christmas holiday because of the irregular milking schedule and lack of student personnel. However, a sample was collected as soon as available on January 10, 1984.

The December 9, 1983, and January 10, 1984, milk samples fulfilled the semimonthly (twice in 31 days) requirement when the allowable collection deviation of 25% is considered. The routine sampling schedule will be resumed in April, 1984.

4.10.3 Required Air Sampling Locations

GGNS Technical Specifications require three of the air sample monitors to be located in areas of the highest calculated annual average ground-level X/Q. This includes the north, north-northwest and southwest sectors. Air samplers used to meet this requirement are AS-7 MT north, AS-9 GGMP north and AS-4 GJOE southwest. Although AS-9 is located in the north, it is only a few hundred feet from the north-northwest sector.

The Standard Radiological Effluent Technical Specifications for Boiling Water Reactors (BWRs) require three samplers to be located in areas of the highest calculated annual average ground-level D/Q. Air samplers 6, 7, and 8 (Table 2-1) satisfy this requirement.

Efforts are underway to revise GGNS Technical Specifications to more accurately reflect BWR Standard Technical Specifications. For purposes of the 1983 report, the following air sampling locations will be used to fulfill the three required offsite locations for the GGNS and Standard Technical Specifications:

- o AS 4 GJOE
- o AS 6 RS
- o AS 7 MT
- o AS 8 WR
- o AS 9 GGMP

4.10.4 Broadleaf Vegetation

Due to the unavailability of vegetation during the winter and summer months, some of the broadleaf vegetation samples were collected from sectors not having the highest calculated D/Q. Table 4-3 summarizes the 1983 vegetation sample collection.

A problem with interpretation of GGNS Technical Specifications was the cause of inadequate sampling and reporting in 1983. These deficiencies were noted during an NRC inspection in February, 1984.

In order to be consistent with Standard Technical Specifications, efforts have been begun to revise and clarify GGNS Technical Specifications. Efforts are also underway to improve the garden site in Sector J by providing topsoil and water to the area. This should improve the availability of vegetation samples for near site sampling. Radiological & Environmental Services personnel are working in conjunction with Alcorn State University's Agricultural Department to provide a permanent control vegetation plot at their Facility. This will ensure that control vegetation samples are available on a routine basis.

4.10.5 TLDs

During the 1983 reporting period, two areas of concern were noted in direct radiation surveillance. An explanation is provided in the following discussion:

- o The remoteness of the GGNS site presented difficulties in establishing the outer ring of TLDs required by GGNS Technical Specifications.

TABLE 4-3

1983 BROADLEAF VEGETATION SAMPLE COLLECTION

Month	Sector J	Other Sectors	Control Samples
January	Not Available	Not Available	2 Samples
February	Not Available	1 Sample	Not Available
March	Not Available	Not Available	Not Available
April	2 Samples	Not Available	Not Available
May	1 Sample	Not Available	Not Available
June	3 Samples	Not Available	Not Available
July	3 Samples	1 Sample	Not Available
August	Not Available	3 Samples	Not Available
September	Not Available	4 Samples	Not Available
October	Not Available	4 Samples	Not Available
November	1 Sample	1 Sample	Not Available
December	1 Sample	1 Sample	Not Available

This resulted in the following discrepancies during the reporting period:

- Sector A was inaccessible from 1-10 miles and beyond; consequently, the outer ring did not have a TLD badge in Sector A.
- Sectors Q, R, L, B and J were inaccessible in the 4 to 5 mile range. TLD badges were placed at the first convenient locations of 8.0, 8.0, 5.2, 5.5 and 3.5 miles respectively.
- o TLD badges collected during the 1983 reporting period averaged 21.4 mrem/quarter. This is a 2.8 mrem increase over the 1982 average of 18.6 mrem/quarter. The 1983 increase is directly attributable to the third quarter average exposure of 30.4 mrem.

Exposure of the 3rd Quarter 1983 Control TLD M-00 increased by approximately a factor of two over the previous quarters as did the remainder of the TLDs. Since no known release or exposure occurred during the 3rd Quarter 1983, improper TLD annealing or in-transit exposure was the likely cause of the abnormal readings. This hypothesis is supported by collocated Nuclear Regulatory Commission/MP&L TLDs averaging 16.2 mrem and 35.8 mrem respectively for the 3rd Quarter 1983.

4.10.6 Fish Samples

A catfish sample was not available in December, 1983 due to seasonal fluctuation of that species. A sample of buffalo fish was substituted in place of catfish. GGNS Technical Specifications are being revised to permit sampling of "commercially or recreationally important species" rather than "catfish".

SECTION 5

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE PROGRAM SUMMARY

5.1 PROGRAM RESULTS FOR 1983

The results of the Radiological Environmental Surveillance Program for 1983 are summarized in Table 5-1.

TABLE 5-1

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(\bar{f}) ^b Range	Location with Highest Annual Mean		Control Locations Mean(\bar{f}) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(\bar{f}) ^b Range		
Background Radiation (TLD) (mrem/Qtr) 0-2 miles	Gamma Dose 58	1.0	21.3 (58/58) (9.8-38.9)	Badge M-46, Grand Gulf/ Waterloo Road Intersection (Sector E, 1 mile)	24.6 (4/4) (16.9-38.9)	N/A	0
Control (Badge M-14)	Gamma Dose 4	1.0	N/A	N/A		20.6 (4/4) (15.8-29.7)	0
Population Centers	Gamma Dose 25	1.0	23.5 (25/25) (14.6-45.6)	Badge M-01 Lake Claiborne (Sector E, 3.5 miles)	27.5 (4/4) (17.4-45.6)	N/A	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (\bar{f})^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(\bar{f}) ^b Range	Location with Highest Annual Mean		Number of Nonroutine Reported Measurements ^c	
				Name Distance and Direction	Mean(\bar{f}) ^b Range		Control Locations Mean(\bar{f}) ^b Range
Air Particulates/ Airborne Iodine (pCi/m ³)(X/Q)	Gross B (264)	0.01	0.02 (258/264) (0.01-0.06)	AS9 GGMP (Sector A, 1.5 mile)	0.02 (52/52) (0.01-0.06)	0.02 (51/53) (0.01-0.07)	0
AS-1 PG	Iodine-131 (264)	0.07	LLD		N/A	LLD	0
AS-3 61VA							
AS-4 GJOE							
AS-7 MI	Gamma Isotopic (20)	0.01	LLD		N/A	LLD	0
AS-9 GGMP							

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1

^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (\bar{f})

^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(\bar{x}) ^b Range	Location with Highest Annual Mean		Control Locations Mean(\bar{x}) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(\bar{x}) ^b Range		
Air Particulates/ Airborne Iodine (pCi/m ³) (D/Q) AS-1 PG AS-3 61VA AS-6 RS AS-7 MT AS-8 WR	Gross B (263)	0.01	0.02 (257/263) (0.01-0.07)	AS 6 RS (Sector C, 0.5 mile)	0.02 (51/53) (0.01-0.06)	0.02 (51/53)	0
				AS 8 WR (Sector E, 0.5 mile)	0.02 (52/53) (0.01-0.07)		
	Iodine-131 (263)	0.07	LLD		N/A	LLD	0
	Gamma Isotopic (20)	0.01	LLD		N/A	LLD	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations ^b Mean(\bar{f}) Range	Location with Highest Annual Mean		Control Locations Mean(\bar{f}) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(\bar{f}) ^b Range		
Milk (pCi/l)							
Aicorn State Univ. (Sector K, 10.5 miles)	Iodine-131 23	1	N/A	N/A	N/A	LLD	0
	Gamma Isotopic 23	15	N/A	N/A	N/A	LLD	0
Johnson Farm, Claiborne County, MS (Sector G, 9.0 miles)	Iodine-131 12	1	N/A	N/A	N/A	LLD	0
	Gamma Isotopic 12	15	N/A	N/A	N/A	LLD	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (\bar{f})^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)

Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(\bar{f}) _b Range	Location with Highest Annual Mean		Control Locations Mean(\bar{f}) _b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(\bar{f}) _b Range		
Milk (pCi/l) Warren Farm, Tensas Parish, LA (Sector N, 8.5 miles)	Iodine-131 2	1	N/A	N/A	N/A	LLD	0
	Gamma Isotopic 2	15	N/A	N/A	N/A	LLD	0
Bell Farm, (Sector E, 8.0 miles)	Iodine-131 3	1	N/A	N/A	N/A	LLD	0
	Gamma Isotopic 3	15	N/A	N/A	N/A	LLD	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (\bar{f})^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(f) ^b Range	Location with Highest Annual Mean		Control Locations Mean(f) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(f) ^b Range		
Surface Water (pCi/l)							
Mississippi River Upstream	Gamma Isotopic 12	15	N/A	N/A	N/A	LLD	0
	Tritium 4	330	N/A	N/A	N/A	LLD	0
Mississippi River Downstream	Gamma Isotopic 12	15	LLD	N/A	N/A	N/A	0
	Tritium 4	330	LLD	N/A	N/A	N/A	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(f) ^b Range	Location with Highest Annual Mean		Control Locations Mean(f) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(f) ^b Range		
Surface Water (pCi/l)							
Discharge Basin	Gamma Isotopic 12	15	LLD	N/A	N/A	N/A	0
	Tritium 4	330	LLD	N/A	N/A	N/A	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1

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

^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(f) ^b Range	Location with Highest Annual Mean		Control Locations Mean(f) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(f) ^b Range		
Ground Water (pCi/l)							
TRIMWELL							
(Sector E, 0.7 miles)	Gamma	15	LLD	N/A	N/A	N/A	0
	Isotopic 4	330	LLD	N/A	N/A	N/A	0
Port Gibson Well (Sector G, 5.0 miles)	Gamma	15	LLD	N/A	N/A	N/A	0
	Isotopic 4	330	LLD	N/A	N/A	N/A	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1

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

^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(\bar{f}) ^b Range	Location with Highest Annual Mean		Control Locations Mean(\bar{f}) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(\bar{f}) ^b Range		
Cistern Water (pCi/l)							
Trimble Cistern (Sector E, 0.5 miles)	Gross B 12	1	4.2 (11/12) (1-10)	N/A	N/A	N/A	0
	Iodine-131 12	1	LLD	N/A	N/A	N/A	0
	Gamma Isotopic 12	15	LLD	N/A	N/A	N/A	0
	Tritium 4	330	220 (1/4) (220)	N/A	N/A	N/A	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(f) ^b Range	Location with Highest Annual Mean		Control Locations Mean(f) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(f) ^b Range		
Cistern Water (pCi/l)							
Willis Cistern (Sector D, 6 miles)	Gross B 12	1	2.4 (7/12) (1-5)	N/A	N/A	LLD	0
	Iodine-131 12	1	LLD	N/A	N/A	LLD	0
	Gamma Isotopic 12	15	LLD	N/A	N/A	LLD	0
	Tritium 4	330	LLD	N/A	N/A	LLD	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)

Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, Mississippi Reporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(\bar{f}) ^b Range	Location with Highest Annual Mean		Control Locations Mean(\bar{f}) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(\bar{f}) ^b Range		
(Broadleaf) Vegetation (pCi/g wet)							
MPL Garden Area (Sector J, 0.5 and 0.8 miles)	Gamma Isotopic 11	0.08	LLD	N/A	N/A	N/A	0
Control (Guider Farm) (Sector B, 18.7 miles)	Gamma Isotopic 2	0.08	N/A	N/A	N/A	LLD	0
Data Samples	Gamma Isotopic 15	0.08	N/A	N/A	N/A	LLD	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1

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

^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Clalborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(f) ^b Range	Location with Highest Annual Mean		Control Locations Mean(f) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(f) ^b Range		
Sediment (pCi/g dry) (Hamilton Lake Outfall and Barge Slip)	Gamma Isotopic 4	0.15	LLD	N/A	N/A	LLD	0
	Cs-137 4	0.18	0.3 (2/4) (0.2-0.4)	Barge Slip (Sector Q, 2 miles)	0.3 (2/2) (0.2-0.4)	0.2 (1/1) (0.2)	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(\bar{f}) _b Range	Location with Highest Annual Mean		Control Locations Mean(\bar{f}) _b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(\bar{f}) _b Range		
Fish (pCi/g wet)							
Mississippi River Upstream	Gamma Isotopic 2	0.13	N/A	N/A	N/A	LLD	0
Mississippi River Downstream	Gamma Isotopic 2	0.13	LLD	N/A	N/A	N/A	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (\bar{f})^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

TABLE 5-1 (cont'd)

RADIOLOGICAL SURVEILLANCE PROGRAM SUMMARY (1983)Name of Facility: Grand Gulf Nuclear Station Docket No.: 50-416Location of Facility: Claiborne, MississippiReporting Period: January 1, 1983 - December 31, 1983

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean(\bar{f}) ^b Range	Location with Highest Annual Mean		Control Locations Mean(\bar{f}) ^b Range	Number of Nonroutine Reported Measurements ^c
				Name Distance and Direction	Mean(\bar{f}) ^b Range		
Meat (pCi/g wet)	Gamma Isotopic (1)	0.13	LLD	N/A	N/A	N/A	0

^a Nominal Lower Limit of Detection (LLD) as defined in HASL-300 (Rev. 8/73), pp. D-08-01, 02, 03, and Tech Spec. Table 4.12.1-1^b Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (\bar{f})^c Nonroutine reported measurements are defined in Section 4

N/A Not Applicable

SECTION 6
QUALITY CONTROL DATA

6.1 QUALITY CONTROL ANALYSES SUMMARY

The analyses conducted for quality control purposes on GGNS environmental samples are summarized in Table 6-1.

TABLE 6-1

1983 Quality Control Analyses Summary

The table below summarizes results of samples run for process quality control purposes during the subject year. These listings are in addition to such measurements as detector backgrounds, check source values, radiometric-gravimetric comparisons or system calibrations.

Blank Samples

<u>Radionuclide Analyzed</u>	<u>Number of Determinations</u>	<u>Number of Analyses Exceeding the LLD for that Analysis</u>
Gross Alpha	49	0
Gross Beta	101	0
H-3	90	0
U-234	17	0
Th-230	19	0
Ra-226	37	0
Pb-210	29	0
I-131	*	0
Sr-89,90	81	0
Pu-239	32	0
Am-241	3	0

* Blank I-131 analyses are performed with each batch of samples processed. Results of these analyses were below the detection limit.

TABLE 6-1 (cont'd)

Spiked Samples

<u>Radionuclide Analyzed</u>	<u>Number of Det'ns</u>	<u>Within 2 sigma of known</u>	<u>Within 3 sigma of known</u>	<u>Differing from know by < 3 sigma</u>
Gross Alpha	49	49	-	-
Gross Beta	101	101	-	-
H-3	90	90	-	-
U-234	17	17	-	-
Th-230	19	19	-	-
Ra-226	37	37	-	-
Pb-210	29	29	-	-
Sr-90	81	81	-	-
Pu-239	32	32	-	-
Am-241	3	3	-	-

Split Samples

<u>Radionuclide Analyzed</u>	<u>Number of Det'ns</u>	<u>No. Agreeing Within 2 sigma</u>	<u>No. Agreeing Within 3 sigma</u>	<u>No. Differing by < 3 sigma</u>
Gross Alpha	47	47	-	-
Gross Beta	142	142	-	-
H-3	151	151	-	-
U-234	12	12	-	-
Th-230	10	10	-	-
Ra-226	21	20	1	-
Pb-210	19	19	-	-
Sr-89	47	47	-	-
Sr-90	54	54	-	-
Pu-239	12	12	-	-
Am-241	3	2	1	-
Gamma	13	13	-	-

6.2 U. S. ENVIRONMENTAL PROTECTION AGENCY-EBERLINE INTERCOMPARISON PROGRAM

To gauge the accuracy of environmental analyses, Eberline Instrument Corporation (analysis contractor for GGNS) participated in the Intercomparison Program in 1983, as in former years, the results of which are displayed in Table 6-2.

TABLE 6-2

1983 USEPA-EBERLINE INTERCOMPARISON PROGRAM

<u>Sample Type</u>	<u>Analysis</u>	<u>Value (EPA)</u>	<u>Value (EIC)</u>	<u>Units</u>
Air Filter	Alpha	26±11.2	19±2	pCi/Filter
Air Filter	Beta	68±8.7	72±7	pCi/Filter
Air Filter	Sr-90	20±2.6	26±8	pCi/Filter
Air Filter	Cs-137	27±8.7	42±6	pCi/Filter
Air Filter	Alpha	13±8.7	9±1	pCi/Filter
Air Filter	Beta	36±8.7	41±4	pCi/Filter
Air Filter	Sr-90	10±2.6	12±5	pCi/Filter
Air Filter	Cs-137	15±8.7	10±2	pCi/Filter
Food	Sr-89	35±8.7	31±19	pCi/kg
Food	Sr-90	28±8.7	42±9	pCi/kg
Food	I-131	37±10.4	<27	pCi/kg
Food	Cs-137	31±8.7	52±23	pCi/kg
Milk	Sr-89	37±8.7	19±9	pCi/l
Milk	Sr-90	18±2.6	11±4	pCi/l
Milk	I-131	55±10.4	66±7	pCi/l
Milk	Cs-137	26±8.7	28±3	pCi/l
Milk	K	1512±131	1850±190	pCi/l
Milk	Sr-89	15±8.7	14±6	pCi/l
Milk	Sr-90	14±2.6	16±3	pCi/l
Milk	I-131	40±10.4	54±4	pCi/l
Milk	Cs-137	33±8.7	36±20	pCi/l
Milk	K	1550±135	1550±210	mg/l
Water	Alpha	29±13	17±2	pCi/l
Water	Beta	31±8.7	44±6	pCi/l
Water	Alpha	11±8.7	17±3	pCi/l
Water	Beta	57±8.7	46±5	pCi/l
Water	Alpha	7±5.0	7±2	pCi/l
Water	Beta	22±5.0	24±2	pCi/l
Water	Alpha	14±8.7	13±2	pCi/l
Water	Beta	16±8.7	33±2	pCi/l
Water	U	31±10.4	27±5	pCi/l
Water	Sr-89	29.2±8.7	12±8	pCi/l
Water	Sr-90	17.2±2.6	22±4	pCi/l
Water	Sr-89	15±8.7	7±5	pCi/l
Water	Sr-90	10±2.6	5±2	pCi/l
Water	H-3	2560±612	3090±510	pCi/l
Water	H-3	1529±337	1600±600	pCi/l
Water	H-3	1210±570	1370±600	pCi/l
Water	Pu-239	8.6±1.5	9.0±0.5	pCi/l
Water	I-131	27±10.4	19±4	pCi/l
Water	I-131	14±6	16±2	pCi/l
Water	Cr-51	45±9	102±70	pCi/l

TABLE 6-2 (Cont'd)

<u>Sample Type</u>	<u>Analysis</u>	<u>Value (EPA)</u>	<u>Value (EIC)</u>	<u>Units</u>
Water	Co-60	22±9	23±3	pCi/l
Water	Zn-65	21±9	20±3	pCi/l
Water	Ru-106	48±9	49±13	pCi/l
Water	Cs-134	20±9	21±3	pCi/l
Water	Cs-137	19±9	20±3	pCi/l
Water	Cr-51	51±8.7	42±37	pCi/l
Water	Co-60	19±8.7	21±3	pCi/l
Water	Zn-65	40±8.7	28±5	pCi/l
Water	Ru-106	52±8.7	46±17	pCi/l
Water	Cs-134	15±8.7	13±3	pCi/l
Water	Cs-137	22±8.7	22±3	pCi/l
Water	Ra-226	12.7±3.3	6.6±2.0	pCi/l
Water	Ra-228	0	<6.0	pCi/l
Water	Ra-226	4.8±0.7	4.4±1.3	pCi/l
Water	Ra-228	0	<2	pCi/l
Water	Ra-226	3.1±0.81	2.5±0.8	pCi/l
Water	Ra-228	2.0±0.52	<5.3	pCi/l
Water	Alpha	46±19.9	87±39	pCi/l
Water	Beta	143±12.4	138±54	pCi/l
Water	Sr-89	24±8.7	25±4	pCi/l
Water	Sr-90	13±2.6	20±4	pCi/l
Water	Ra-226	8.5±2.25	6.8±2.0	pCi/l
Water	Ra-228	4.7±1.21	<46	pCi/l
Water	Co-60	30±8.7	29±2	pCi/l
Water	Cs-134	33±8.7	29±4	pCi/l
Water	Cs-137	27±8.7	25±4	pCi/l
Water	U	25±10.4	19±1	pCi/l

NOTE: Includes all data received for 1983 samples up to 02/10/84.

6.3 BATELLE NORTHWEST - EBERLINE TLD INTERCOMPARISON PROGRAM

The results of the TLD Intercomparison Program conducted between Batelle Northwest Laboratories and Eberline Instrument Corporation for 1983 are summarized in Table 6-3.

TABLE 6-3

TLD INTERCOMPARISON QC DATA
 (Eberline-Battelle Pacific Northwest Labs)
 1983

Total mrem \pm 2 Sigma

1st Quarter		2nd Quarter		3rd and 4th Quarter	
Actual	Measured	Actual	Measured	Actual	Measured
27	24 \pm 6	90	80 \pm 14	15	13 \pm 4
36	32 \pm 3	90	85 \pm 11	15	14 \pm 13
40	37 \pm 4	84	90 \pm 13	28	30 \pm 4
45	41 \pm 7	68	70 \pm 13	28	34 \pm 7
58	53 \pm 5	50	47 \pm 5	40	37 \pm 4
69	62 \pm 6	50	50 \pm 7	40	40 \pm 7
69	64 \pm 6	68	59 \pm 7	57	52 \pm 5
69	64 \pm 9	84	81 \pm 8	57	58 \pm 6
97	85 \pm 15	99	97 \pm 16	88	75 \pm 10
97	85 \pm 15	99	102 \pm 10	88	77 \pm 8

SECTION 7
SAMPLING AND ANALYSIS RESULTS FOR 1983

7.1 DATA FOR 1983

This section summarizes data obtained on samples analyzed from January 1, 1983 through December 31, 1983 in the Radiological Environmental Surveillance Program for GGNS.

The spectrum is computer scanned from -20 to -2000 KeV. Specifically included are Ce-144, Ba-La-140, Cs-134, Cs-137, Zr-Nb-95, Co-58, Co-60, Mn-54, Zn-65. Naturally occurring gamma-emitting radionuclides such as K-40 and Ra daughters was frequently detected but not listed here. Data listed as " " are at the 3 sigma level, others are 2 sigma. Unless otherwise noted, listed concentration is for Cs-137 and may be slightly more or less sensitive for other nuclides.

The analytical results are presented in Table 7-1.

7.2 NOTES ON DATA TABLES

<u>Wet Weight</u>	A reporting unit used with organic tissue samples such as vegetation and animal samples in which the sample weight is taken to be the weight as received from the field with no moisture removed.
<u>Dry Weight</u>	A reporting unit used with soil and sediment samples in which the sample weight is taken to be the weight of the sample after removal of moisture by drying in an oven at about 110°C for about 15 hours.
<u>pCi/m³</u>	A reporting unit used with air particulate and radiiodine data which refers to the radioactivity content present (expressed in picocuries) the volume of air (expressed in cubic meters) passed through the filter and/or the charcoal trap. The volumes are not corrected to standard conditions.
<u>Gamma Emitters</u> or <u>Gamma Isotopic</u>	Samples were analyzed by high resolution (GeLi) gamma spectrometry. The resulting spectrum is analyzed by a computer program which scans from about 50 to 200 KeV and lists the energy peaks of any radionuclides present in concentrations exceeding the sensitivity limits set for that particular analysis.

Error Terms

Figures following "±" are error terms based on counting uncertainties at the 2 sigma (95 percent confidence) level. Values preceded by the "<" symbol were below the stated concentration at the 4.666 sigma (99.99 percent confidence) level.

Sensitivity

In general, all analyses meet the sensitivity requirements of the program as given in Table 3. For the few samples that do not (because of inadequate sample quantities, analytical interference, or similar problems) the sensitivity actually obtained in the analysis is listed.

When all analyses of a particular type during the period resulted in concentrations below the sensitivity limits, a statement is made on the appropriate table rather than presenting a whole page of "<" data. If all but one or two data points are below the sensitivity limits, the convention described above is followed.

TABLE 7-1

1983 SAMPLING AND ANALYSES RESULTS

MISSISSIPPI POWER AND LIGHT

AIRBORNE I-131 AND GROSS BETA CONCENTRATIONS IN AIR PARTICULATE FILTERS

Collection Date	A/S- 01			A/S- 02			A/S- 03		
	Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³	
		Gross β	I-131		Gross β	I-131		Gross β	I-131
01/04/83	385	2±1	<7	330	2±1	<7	335	4±1	<7
01/11/83	330	2±1	<7	300 (a)	2±1	<7	300 (a)	1±1	<7
01/17/83	290	1±1	<7	325	2±1	<7	280	<1	<7
01/24/83	375 (b)	1±1	<7	335	1±1	<7	290	1±1	<7
02/01/83	335	4±1	<7	370	2±1	<7	370	1±1	<7
02/07/83	245	1±1	<7	250	1±1	<7	250	1±1	<7
02/14/83	325	2±1	<7	325	2±1	<7	325	1±1	<7
02/21/83	330	1±1	<7	335	2±1	<7	285	1±1	<7
03/01/83	380	2±1	<7	380	2±1	<7	325	1±1	<7
03/07/83	280	2±1	<7	285	2±1	<7	285	1±1	<7
03/14/83	335	1±1	<7	335	2±1	<7	310	1±1	<7
03/21/83	335	1±1	<7	380	1±1	<7	380	1±1	<7
03/28/83	335	1±1	<7	290	2±1	<7	215	<1	<7
04/04/83	330	1±1	<7	330	2±1	<7	40	3±2	<12*
04/11/83	330	1±1	<7	380(c)	1±1	<7	380(c)	1±1	<7
04/19/83	390	1±1	<7	330	2±1	<7	330	1±1	<7
04/25/83	280	2±1	<7	280	4±1	<7	280	1±1	<7
05/03/83	375	2±1	<7	380	4±1	<7	375	2±1	<7
05/09/83	285	1±1	<7	290	4±1	<7	290	4±1	<7
05/16/83	335	1±1	<7	325	1±1	<7	325	2±1	<7
05/23/83	330	2±1	<7	335	1±1	<7	335	1±1	<7
05/31/83	385	1±1	<7	375	2±1	<7	375	1±1	<7
06/07/83	330	1±1	<7	330	1±1	<7	330	1±1	<7
06/14/83	335	1±1	<7	(d)	(d)	(d)	335	2±1	<7
06/21/83	330	1±1	<7	330	1±1	<7	330	2±1	<7
06/28/83	335	<1	<7	335	1±1	<7	345	1±1	<7

* Insufficient sample volume for more sensitive analysis

(a) Collection date 01/10/83

(c) Collection date 04/12/83

(b) Collection date 01/25/83

(d) Sample not available. See list of missed samples.

MISSISSIPPI POWER AND LIGHT

AIRBORNE I-131 AND GROSS BETA CONCENTRATIONS IN AIR PARTICULATE FILTERS

Collection Date	A/S- 01			A/S- 02			A/S- 03		
	Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³	
		Gross β	I-131		Gross β	I-131		Gross β	I-131
07/05/83	355	1±1	<7	355	1±1	<7	345	1±1	<7
07/11/83	285	2±1	<7	330	2±1	<7	330	2±1	<7
07/19/83	380	1±1	<7	375	2±1	<7	375	2±1	<7
07/26/83	285	2±1	<7	315	4±1	<7	315	3±1	<7
08/01/83	300	2±1	<7	355	3±1	<7	370	2±1	<7
08/08/83	360	4±1	<7	350	1±1	<7	350	2±1	<7
08/15/83	400	1±1	<7	400	1±1	<7	400	1±1	<7
08/23/83	400	1±1	<7	400	1±1	<7	400	1±1	<7
08/30/83	380	4±1	<7	355	4±1	<7	355	5±1	<7
09/06/83	380	2±1	<7	355	2±1	<7	355	2±1	<7
09/13/83	385	1±1	<7	40(a)	<1	<7	355	1±1	<7
09/20/83	355	5±1	<7	355	4±1	<7	355	5±1	<7
09/27/83	360	1±1	<7	280	<1	<7	360	2±1	<7
10/04/83	365	6±1	<7	240	6±1	<7	360	7±1	<7
10/11/83	395(b)	4±1	<7	(c)	(c)	(c)	390	4±1	<7
10/18/83	320	1±1	<7	(c)	(c)	(c)	335	1±1	<7
10/25/83	350	1±1	<7	350	1±1	<7	350	1±1	<7
11/01/83	380	2±1	<7	355	2±1	<7	355	2±1	<7
11/08/83	360	1±1	<7	360	3±1	<7	340	2±1	<7
11/15/83	360	1±1	<7	360	1±1	<7	350	1±1	<7
11/22/83	360	1±1	<7	360	1±1	<7	355	1±1	<7
11/29/83	355	1±1	<7	355	1±1	<7	355	1±1	<7
12/06/83	355	1±1	<7	355	1±1	<7	355	2±1	<7
12/13/83	360	2±1	<7	360	2±1	<7	360	4±1	<7
12/20/83	350	1±1	<7	350	1±1	<7	355	3±1	<7
12/27/83	365	2±1	<7	360	3±1	<7	365	3±1	<7
01/03/84	365	1±1	<7	360	2±1	<7	360	1±1	<7

(a) Sampler problem

(b) Collection date was 10/12/83

(c) Sampler inoperative (see list of missed samples)

MISSISSIPPI POWER AND LIGHT

AIRBORNE I-131 AND GROSS BETA CONCENTRATIONS IN AIR PARTICULATE FILTERS

Collection Date	A/S-04			A/S-05			A/S-06		
	Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³	
		Gross β	I-131		Gross β	I-131		Gross β	I-131
01/04/83	330	1±1	<7	330	2±1	<7	330	2±1	<7
01/11/83	*	*	*	330	1±1	<7	330	2±1	<7
01/17/83	*	*	*	290	<1	<7	290	2±1	<7
01/24/83	315	1±1	<7	315	1±1	<7	380 (a)	1±1	<7
02/01/83	375	1±1	<7	375	1±1	<7	335	1±1	<7
02/07/83	195	1±1	<7	270	2±1	<7	290	1±1	<7
02/14/83	255	1±1	<7	275	1±1	<7	275	1±1	<7
02/21/83	315	<1	<7	330	1±1	<7	325	2±1	<7
03/01/83	380	1±1	<7	380	2±1	<7	380	2±1	<7
03/07/83	285	2±1	<7	285	2±1	<7	285	3±1	<7
03/14/83	335	1±1	<7	335	2±1	<7	335	2±1	<7
03/21/83	335	<1	<7	335	1±1	<7	335	1±1	<7
03/28/83	335	1±1	<7	315	1±1	<7	335	2±1	<7
04/04/83	330	1±1	<7	330	1±1	<7	330	1±1	<7
04/11/83	330	1±1	<7	330	1±1	<7	330	1±1	<7
04/19/83	390	1±1	<7	390	1±1	<7	390	2±1	<7
04/25/83	280	2±1	<7	280	2±1	<7	280	3±1	<7
05/03/83	380	4±1	<7	380	2±1	<7	380	3±1	<7
05/09/83	235	4±1	<7	240	1±1	<7	290	3±1	<7
05/16/83	320	1±1	<7	330	1±1	<7	330	2±1	<7
05/23/83	270	3±1	<7	270	3±1	<7	270	1±1	<7
05/31/83	380	2±1	<7	380	2±1	<7	380	1±1	<7
06/07/83	330	1±1	<7	330	2±1	<7	330	2±1	<7
06/14/83	345	2±1	<7	345	2±1	<7	340	2±1	<7
06/21/83	325	1±1	<7	325	1±1	<7	325	<1	<7
06/28/83	330	1±1	<7	330	1±1	<7	330	1±1	<7

* Sampler out of service. See list of missed samples.

(a) Collection date 01/25/83.

MISSISSIPPI POWER AND LIGHT

AIRBORNE I-131 AND GROSS BETA CONCENTRATIONS IN AIR PARTICULATE FILTERS

Collection Date	A/S- 04			A/S- 05			A/S- 06		
	Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³	
		Gross β	I-131		Gross β	I-131		Gross β	I-131
07/05/83	355	1±1	<7	355	1±1	<7	355	1±1	<7
07/11/83	320	1±1	<7	320	1±1	<7	320	1±1	<7
07/19/83	385	1±1	<7	385	2±1	<7	385	2±1	<7
07/26/83	320	2±1	<7	320	3±1	<7	315	3±1	<7
08/01/83	360	2±1	<7	360	3±1	<7	360	3±1	<7
08/08/83	345	2±1	<7	360	1±1	<7	360	2±1	<7
08/15/83	365	1±1	<7	410	1±1	<7	400	1±1	<7
08/23/83	365	1±1	<7	410	1±1	<7	400	2±1	<7
08/30/83	410	4±1	<7	360	4±1	<7	360	4±1	<7
09/06/83	355	2±1	<7	355	2±1	<7	355	2±1	<7
09/13/83	355	1±1	<7	355	1±1	<7	350	<1	<7
09/20/83	405	5±1	<7	355	5±1	<7	355	4±1	<7
09/27/83	360	1±1	<7	355	1±1	<7	355	1±1	<7
10/04/83	365	6±1	<7	365	7±1	<7	365	6±1	<7
10/11/83	370	5±1	<7	370	4±1	<7	370	4±1	<7
10/18/83	340	2±1	<7	340	1±1	<7	340	2±1	<7
10/25/83	355	1±1	<7	355	1±1	<7	360	1±1	<7
11/01/83	355	1±1	<7	355	2±1	<7	355	1±1	<7
11/08/83	360	1±1	<7	360	1±1	<7	360	1±1	<7
11/15/83	360	1±1	<7	360	1±1	<7	360	1±1	<7
11/22/83	360	1±1	<7	360	1±1	<7	355	1±1	<7
11/29/83	355	1±1	<7	355	1±1	<7	355	2±1	<7
12/06/83	335	1±1	<7	355	1±1	<7	355	1±1	<7
12/13/83	360	3±1	<7	360	2±1	<7	360	2±1	<7
12/20/83	350	1±1	<7	355	1±1	<7	355	1±1	<7
12/27/83	360	3±1	<7	360	3±1	<7	360	2±1	<7
01/03/84	395	1±1	<7	360	1±1	<7	355	1±1	<7

MISSISSIPPI POWER AND LIGHT

AIRBORNE I-131 AND GROSS BETA CONCENTRATIONS IN AIR PARTICULATE FILTERS

Collection Date	A/S-07 10 ⁻² pCi/m ³			A/S-08 10 ⁻² pCi/m ³			A/S-09 10 ⁻² pCi/m ³		
	Volume (m ³)	Gross β	I-131	Volume (m ³)	Gross β	I-131	Volume (m ³)	Gross β	I-131
01/04/83	330	1±1	<7	330	3±1	<7	330	2±1	<7
01/11/83	330	1±1	<7	330	3±1	<7	330	2±1	<7
01/17/83	290	1±1	<7	290	2±1	<7	*	*	*
01/24/83	380 (a)	1±1	<7	340	1±1	<7	380 (a)	1±1	<7
02/01/83	315	1±1	<7	375	2±1	<7	340	2±1	<7
02/07/83	245	1±1	<7	290	1±1	<7	240	2±1	<7
02/14/83	325	1±1	<7	275	1±1	<7	320	2±1	<7
02/21/83	280	1±1	<7	325	2±1	<7	325	1±1	<7
03/01/83	380	1±1	<7	380	1±1	<7	380	2±1	<7
03/07/83	285	2±1	<7	285	2±1	<7	280	2±1	<7
03/14/83	335	1±1	<7	335	2±1	<7	335	1±1	<7
03/21/83	335	<1	<7	335	1±1	<7	335	2±1	<7
03/28/83	245(b)	<1	<7	335	1±1	<7	335	2±1	<7
04/04/83	275	1±1	<7	275	1±1	<7	330	2±1	<7
04/11/83	335	1±1	<7	330	2±1	<7	330	1±1	<7
04/19/83	385	1±1	<7	385	2±1	<7	390	2±1	<7
04/25/83	280	3±1	<7	280	4±1	<7	280	3±1	<7
05/03/83	380	4±1	<7	380	4±1	<7	380	4±1	<7
05/09/83	290	3±1	<7	285	3±1	<7	290	3±1	<7
05/16/83	330	1±1	<7	330	2±1	<7	330	1±1	<7
05/23/83	270	1±1	<7	305	1±1	<7	295	1±1	<7
05/31/83	380	2±1	<7	380	2±1	<7	380	1±1	<7
06/07/83	330	1±1	<7	330	1±1	<7	335	1±1	<7
06/14/83	340	1±1	<7	345	1±1	<7	340	2±1	<7
06/21/83	325	1±1	<7	325	1±1	<7	325	1±1	<7
06/28/83	330	1±1	<7	330	1±1	<7	330	1±1	<7

* out of service. See list of missed samples
(a) Collection date 01/25/83.
(b) Estimated volume

MISSISSIPPI POWER AND LIGHT

AIRBORNE I-131 AND GROSS BETA CONCENTRATIONS IN AIR PARTICULATE FILTERS

Collection Date	A/S-07			A/S-08			A/S-09		
	Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³	
		Gross β	I-131		Gross β	I-131		Gross β	I-131
07/05/83	355	1±1	<7	355	1±1	<7	355	1±1	<7
07/11/83	320	2±1	<7	320	1±1	<7	315	1±1	<7
07/19/83	385	2±1	<7	385	2±1	<7	385	2±1	<7
07/26/83	315	3±1	<7	320	3±1	<7	315	3±1	<7
08/01/83	360	2±1	<7	270	2±1	<7	360	2±1	<7
08/08/83	360	2±1	<7	265	1±1	<7	360	1±1	<7
08/15/83	400	1±1	<7	410	1±1	<7	400	1±1	<7
08/23/83	400	1±1	<7	410	1±1	<7	400	1±1	<7
08/30/83	360	3±1	<7	360	4±1	<7	360	4±1	<7
09/06/83	355	2±1	<7	355	2±1	<7	355	2±1	<7
09/13/83	350	1±1	<7	350	1±1	<7	350	1±1	<7
09/20/83	355	4±1	<7	355	4±1	<7	355	4±1	<7
09/27/83	360	1±1	<7	355	1±1	<7	360	1±1	<7
10/04/83	365	6±1	<7	365	7±1	<7	355	6±1	<7
10/11/83	370	4±1	<7	370	4±1	<7	370	4±1	<7
10/18/83	340	1±1	<7	340	1±1	<7	340	2±1	<7
10/25/83	360	1±1	<7	360	1±1	<7	360	1±1	<7
11/01/83	355	2±1	<7	355	1±1	<7	355	1±1	<7
11/08/83	360	1±1	<7	360	1±1	<7	360	1±1	<7
11/15/83	355	1±1	<7	360	1±1	<7	335	1±1	<7
11/22/83	355	1±1	<7	360	1±1	<7	355	1±1	<7
11/29/83	350	1±1	<7	175	1±1	<7	355	1±1	<7
12/06/83	355	1±1	<7	355	1±1	<7	355	1±1	<7
12/13/83	360	2±1	<7	360	2±1	<7	360	2±1	<7
12/20/83	355	2±1	<7	355	1±1	<7	355	1±1	<7
12/27/83	360	2±1	<7	360	2±1	<7	360	2±1	<7
01/03/84	355	1±1	<7	355	1±1	<7	355	2±1	<7

MISSISSIPPI POWER AND LIGHT

AIRBORNE I-131 AND GROSS BETA CONCENTRATIONS IN AIR PARTICULATE FILTERS

Collection Date	A/S-10			A/S-11		
	Volume (m ³)	10 ⁻² pCi/m ³		Volume (m ³)	10 ⁻² pCi/m ³	
		Gross β	I-131		Gross β	I-131
07/05/83	370	1±1	<7	370	1±1	<7
07/12/83	340	2±1	<7	340	2±1	<7
07/19/83	370	3±1	<7	370	2±1	<7
07/26/83	370	2±1	<7	375	2±1	<7
08/02/83	370	2±1	<7	395	2±1	<7
08/09/83	370	1±1	<7	370	1±1	<7
08/16/83	370	1±1	<7	370	2±1	<7
08/23/83	370	2±1	<7	370	3±1	<7
08/30/83	370	<1	<7	370	3±1	<7
09/06/83	370	3±1	<7	370	3±1	<7
09/13/83	385	2±1	<7	340	3±1	<7
09/20/83	370	4±1	<7	370	<1	<7
09/27/83	45(a)	6±1	<7	355	3±1	<7
10/04/83	(b)	(b)	(b)	355	5±1	<7
10/11/83	70(a)	5±3	<7	355	4±1	<7
10/18/83	145(a)	6±2	<7	355	2±1	<7
10/25/83	305	2±1	<7	355	2±1	<7
11/01/83	385	4±1	<7	360	4±1	<7
11/08/83	360	2±1	<7	360	2±1	<7
11/15/83	355	2±1	<7	355	2±1	<7
11/22/83	355	1±1	<7	355	1±1	<7
11/29/83	355	1±1	<7	355	2±1	<7
12/06/83	355	5±1	<7	355	3±1	<7
12/13/83	360	4±1	<7	355	4±1	<7
12/20/83	355	6±1	<7	355	5±1	<7
12/27/83	355	6±1	<7	355	5±1	<7
01/03/84	355	6±1	<7	355	5±1	<7

(a) Low volume due to sampler problems

(b) Sampler inoperative (see list of missed samples)

MISSISSIPPI POWER AND LIGHT

RADIONUCLIDES IN AIR PARTICULATE SAMPLES
(Quarterly Analysis on Composite of Weekly Collections)

1983

<u>Collection Site</u>	<u>pCi/m³</u>	<u>pCi/m³</u>
	<u>Gamma Emitters</u>	<u>Gamma Emitters</u>
	<u>1st Quarter</u>	<u>2nd Quarter</u>
AS-01	<0.01	<0.01
AS-02	<0.01	<0.01
AS-03	<0.01	<0.01
AS-04	<0.01	<0.01
AS-05	<0.01	<0.01
AS-06	<0.01	<0.01
AS-07	<0.01	<0.01
AS-08	<0.01	<0.01
AS-09	<0.01	<0.01
AS-10	<0.01	<0.01
AS-11	<0.01	<0.01
	<u>3rd Quarter</u>	<u>4th Quarter</u>
AS-01	<0.01	<0.01
AS-02	<0.01	<0.01
AS-03	<0.01	<0.01
AS-04	<0.01	<0.01
AS-05	<0.01	<0.01
AS-06	<0.01	<0.01
AS-07	<0.01	<0.01
AS-08	<0.01	<0.01
AS-09	<0.01	<0.01
AS-10	<0.01	<0.01
AS-11	<0.01	<0.01

MISSISSIPPI POWER AND LIGHT

GAMMA RADIATION

AVERAGE mR/QTR. USING THERMOLUMINESCENT DOSIMETERS

1983

	<u>1st quarter</u>	<u>2nd quarter</u>	<u>3rd quarter</u>	<u>4th quarter</u>
Date Annealed:	12/27/82	03/30/83	06/20/83	09/21/83
Date Read:	04/20/83	07/21/83	10/28/83	01/20/84
<u>Location:</u>	<u>mrem/Quarter</u>			
M-00	9.4±0.9	8.7±1.0	17.2±3.7	10.8±1.6
M-01	21.6±3.8	17.4±1.8	45.6±4.6	25.4±2.9
M-02	21.0±6.1	18.9±1.9	33.3±5.8	26.2±2.9
M-03	18.1±4.7	14.7±1.5	37.7±5.8	21.5±2.2
M-04	20.0±2.0	15.9±3.0	45.4±4.5	23.9±3.6
M-05	17.3±4.2	16.4±1.6	40.7±4.9	21.8±2.8
M-06	21.7±2.5	19.1±2.5	41.2±6.5	26.8±2.1
M-07	24.1±2.4	17.1±1.7	42.3±4.5	25.3±3.7
M-08	19.2±8.2	19.0±2.3	26.2±5.3	26.4±3.1
M-09	15.8±2.2	16.1±1.6	26.3±2.9	21.8±2.2
M-10	16.8±3.3	Missing	28.0±2.9	Missing
M-11	19.7±4.0	16.7±1.7	Missing	20.3±3.9
M-12	18.2±6.4	16.5±2.0	31.5±3.2	25.0±3.2
M-13	19.6±3.4	16.0±2.5	29.0±4.8	20.9±2.6
M-14	18.0±1.8	15.8±3.1	29.7±5.9	21.4±2.4
M-15	14.7±1.5	8.9±1.3	37.0±6.0	19.4±1.9
M-16	19.5±5.0	14.9±2.0	25.0±2.7	19.9±2.2
M-17	18.8±4.4	17.6±1.8	28.9±7.0	21.4±1.7
M-18	21.7±6.2	19.1±2.1	Missing	23.8±1.7
M-19	18.1±3.2	16.2±2.9	39.1±3.7	22.4±1.9
M-20	20.9±5.0	18.4±2.7	37.2±3.7	24.0±2.6
M-21	21.1±3.4	17.2±2.4	37.3±3.7	20.3±4.2
M-22	20.7±2.2	17.3±1.8	43.4±4.3	23.1±2.2
M-23	16.5±4.8	12.3±2.6	36.0±3.6	23.9±2.4
M-24	Missing	22.2±3.4	35.2±3.7	20.6±3.1
M-25	17.0±2.6	11.5±2.1	26.0±3.5	23.0±2.7
M-26	17.3±1.7	10.5±1.6	29.1±2.9	24.3±3.3
M-27	18.3±4.9	12.0±1.2	27.9±2.8	24.3±2.9
M-28	16.6±3.9	16.7±1.7	32.2±3.8	22.3±2.8
M-29	20.7±3.0	17.4±4.0	29.9±3.8	24.5±3.7
M-30	18.9±4.1	16.2±2.6	26.6±2.7	20.9±3.0
M-31	18.9±2.1	16.7±2.5	28.7±2.9	19.1±1.9
M-32	17.6±3.8	16.9±2.0	30.9±3.1	22.7±3.0
M-33	18.4±2.3	17.5±1.8	42.0±4.2	24.4±1.5
M-34	Missing	20.0±2.0	45.7±4.9	Missing
M-35	15.0±2.3	11.6±1.7	42.3±4.2	23.1±1.8
M-36	18.7±1.9	17.5±2.8	38.2±3.8	22.8±2.4
M-37	17.5±2.5	16.3±2.6	28.1±2.8	24.5±2.5
M-38	17.9±3.2	16.4±2.0	28.5±3.1	Missing

MISSISSIPPI POWER AND LIGHT

GAMMA RADIATION

AVERAGE mR/QTR. USING THERMOLUMINESCENT DOSIMETERS

1983

	<u>1st quarter</u>	<u>2nd quarter</u>	<u>3rd quarter</u>	<u>4th quarter</u>
Date Annealed:	12/27/82	03/30/83	06/20/83	09/21/83
Date Read:	04/20/83	07/21/83	10/28/83	01/20/84
<u>Location:</u>	<u>mrem/Quarter</u>			
M-39	16.8±2.1	14.6±1.5	24.3±2.8	22.7±3.4
M-40	Missing	23.1±4.0	27.3±2.7	22.3±2.4
M-41	15.0±1.6	9.8±1.0	35.5±3.5	Missing
M-42	14.1±1.4	10.5±1.2	35.2±3.5	22.3±2.2
M-43	20.0±3.0	17.1±1.7	42.5±4.2	24.4±3.0
M-44	15.9±2.7	12.2±3.2	24.1±2.9	19.9±4.0
M-45	18.0±3.2	15.7±1.7	26.4±2.6	25.0±3.6
M-46	17.7±1.9	16.9±1.7	38.9±4.9	25.0±3.0
M-47	18.0±2.0	17.0±3.3	28.5±3.1	23.0±2.4
M-48	17.7±4.1	16.1±3.6	29.8±2.9	24.2±2.4
M-49	15.8±3.2	17.2±1.7	Missing	25.6±3.8
M-50	17.0±3.0	Missing	24.4±3.9	20.7±2.1
M-51	18.1±3.3	16.5±2.7	27.1±2.7	24.0±5.1
M-52	19.6±2.0	16.5±2.8	29.1±3.2	24.7±2.5
M-53	16.1±1.9	14.1±2.1	24.6±2.5	19.4±2.7
M-54	16.2±3.9	13.5±3.0	35.6±6.0	21.0±3.5
M-55	19.2±4.0	17.1±2.3	28.7±2.9	24.6±2.5
M-56	21.1±3.1	16.2±1.9	36.4±5.9	21.6±2.3
M-57	21.9±2.2	20.6±3.5	43.3±4.3	25.2±5.0
M-58	17.7±1.8	13.8±3.1	34.9±3.4	Missing
M-59	16.3±2.5	11.6±1.2	31.6±3.1	20.1±3.0
M-60	18.7±2.0	14.0±1.4	Missing	22.8±2.3
M-61	15.4±1.5	15.6±3.6	20.9±3.1	19.2±2.3
M-62	16.1±2.5	12.0±4.5	22.3±2.2	18.3±2.5
M-63	17.4±1.0	12.6±2.7	22.8±3.4	19.1±4.2
M-64	14.8±2.0	10.7±1.9	23.4±3.1	18.8±4.2
M-65	15.6±2.9	13.9±2.4	25.2±3.4	19.0±3.1
M-66	16.2±3.4	14.3±2.3	26.9±2.6	20.2±3.0
M-67	17.0±3.7	11.9±1.7	26.9±3.7	28.1±3.9
M-68	17.2±1.7	11.6±2.5	24.8±3.8	23.2±2.1
M-69	15.3±1.5	9.9±2.4	21.8±2.7	18.9±2.5
M-70	14.2±1.4	11.6±2.5	Missing	15.9±2.9

MISSISSIPPI POWER AND LIGHT

GAMMA RADIATION

AVERAGE mR/QTR. USING THERMOLUMINESCENT DOSIMETERS

1983

	<u>1st quarter</u>	<u>2nd quarter</u>	<u>3rd quarter</u>	<u>4th quarter</u>
Date Annealed:	12/27/82	03/30/83	06/20/83	09/21/83
Date Read:	04/20/83	07/21/83	10/28/83	01/20/84
<u>Location:</u>	<u>mrem/Quarter</u>			
M-71	13.1±1.8	10.0±2.8	14.6±1.5	18.3±2.8
M-72	11.6±1.3	9.5±2.6	13.4±2.9	17.7±2.5
M-73	17.0±1.7	13.1±1.4	20.2±3.5	20.3±1.6
M-74	16.4±4.2	13.6±2.1	19.9±2.5	20.4±2.7
M-75	13.6±1.4	12.0±1.8	18.4±1.8	17.8±2.5
M-76	15.2±2.3	18.1±2.9	21.5±2.0	19.9±1.9
M-77	14.9±1.5	12.9±1.3	20.0±2.5	18.1±1.8
M-78	16.3±2.0	16.3±1.6	24.6±2.6	19.1±1.7
M-79	18.4±4.2	17.2±1.7	25.1±2.9	20.6±3.2
M-80	22.9±2.3	23.2±3.5	30.3±3.0	24.6±3.2
M-81	23.6±2.4	22.7±2.3	30.2±3.5	26.5±3.8
M-82	22.3±4.0	22.7±4.0	29.6±4.1	26.0±2.6
M-83	21.8±2.2	19.0±3.5	27.7±2.2	21.8±2.2
M-84	13.8±1.4	12.6±1.9	22.6±2.3	16.9±1.7
M-85	17.2±1.7	18.1±3.7	35.0±4.9	24.6±2.7
M-86	16.8±1.7	18.7±2.7	38.6±4.1	23.3±2.3
M-87	19.3±2.2	19.0±2.9	38.8±3.8	24.0±3.5

MISSISSIPPI POWER AND LIGHT
 RADIOACTIVITY IN MILK SAMPLES
 (Monthly Collections)

Collection Period	Collection Site	pCi/l	
		I-131	Gamma Emitters
01/06/83	Warren-Farm	<1	<15
01/11/83	Alcont	<1	<15
02/11/83	Johnson Farm	<1	<15
01/25/83	Alcont	<1	<15
02/01/83	Alcont	<1	<15
02/02/83	Johnson Farm	<1	<15
02/02/83	Warren Farm	<1	<15
02/16/83	Alcont	<1	<15
03/01/83	Johnson Farm	<1	<15
03/03/83	Alcont	<1	<15
03/17/83	Alcont	<1	<15
04/11/83	Alcont	<1	<15
04/10/83	Johnson Farm	<1	<15
04/27/83	Alcont	<1	<15
05/08/83	Johnson Farm	<1	<15
05/10/83	Alcont	<1	<15
05/23/83	Alcont	<1	<15
06/06/83	Alcont	<1	<15
06/05/83	Johnson Farm	<1	<15
06/20/83	Alcont	<1	<15
07/08/83	Alcont	<1	<15
07/07/83	Johnson Farm	<1	<15
07/19/83	Alcont	<1	<15
08/07/83	Johnson Farm	<1	<15
08/08/83	Alcont	<1	<15
08/23/83	Alcont	<1	<15
09/05/83	Johnson Farm	<1	<15
09/06/83	Alcont	<1	<15
09/07/83	Bell Farm	<1	<15
09/20/83	Alcont	<1	<15
10/14/83	Johnson Farm	<1	<15
10/14/83	Bell Farm	<1	<15
10/17/83	Alcont	<1	<15
10/26/83	Alcont	<1	<15
11/08/83	Johnson Farm	<1	<15
11/09/83	Bell Farm	<1	<15
11/10/83	Alcont	<1	<15
11/22/83	Alcont	<1	<15
12/06/83	Alcont	<1	<15
12/09/83	Johnson Farm	<1	<15

MISSISSIPPI POWER AND LIGHT

RADIOACTIVITY IN CISTERN WATER SAMPLES
(Monthly Collections)

Date	Will Cist pCi/l			Collection Date	Trim Cist 2N pCi/l		
	Gross Beta	I-131	Gamma Emitters		Gross Beta	I-131	Gamma Emitters
01/11/83	<1	<1	<15	01/11/83	6±2	<1	<15
02/01/83	1±1	<1	<15	02/02/83	3±1	<1	<15
03/01/83	2±2	<1	<15	03/03/83	<1	<1	<15
04/09/83	2±2	<1	<15	04/11/83	2±1	<1	<15
05/01/83	<1	<1	<15	05/04/83	2±1	<1	<15
06/06/83	<1	<1	<15	06/06/83	4±2	<1	<15
07/01/83	<2	<1	<15	07/06/83	10±2	<1	<15
08/07/83	2±2	<1	<15	08/09/83	6±2	<1	<15
09/08/83	<1	<1	<15	09/08/83	4±2	<1	<15
10/12/83	5±1	<1	<15	10/12/83	5±2	<1	<15
11/07/83	2±1	<1	<15	11/07/83	1±1	<1	<15
12/12/83	2±1	<1	<15	12/12/83	3±1	<1	<15

TRITIUM CONCENTRATIONS IN CISTERN WATER SAMPLES
(Quarterly Collections)

Collection Period	pCi/l	
	Will Cist	Trim Cist 2N
1st Quarter, 83'	<330	<330
2nd Quarter, 83'	<330	<330
3rd Quarter, 83'	<330	<330
4th Quarter, 83'	<330	220±180

MISSISSIPPI POWER AND LIGHT

RADIONUCLIDES IN SURFACE WATER SAMPLES
(Monthly Collections)

<u>Collection Period</u>	GAMMA EMITTERS	
	pCi/l	
	<u>MRUP 1N</u>	<u>MRDOWN 2N</u>
01/18/83	<15	<15
02/17/83	<15	<15
03/17/83	<15	<15
04/21/83	<15	<15
05/19/83	<15	<15
06/23/83	<15	<15
07/21/83	<15	<15
08/18/83	<15	<15
09/22/83	<15	<15
10/20/83	<15	<15
11/17/83	<15	<15
12/15/83	<15	<15

1983

TRITIUM CONCENTRATION IN SURFACE WATER SAMPLES
(Quarterly Composites)

<u>Collection Period</u>	TRITIUM	
	pCi/l	
	<u>MRUP 1N</u>	<u>MRDOWN 2N</u>
1st Quarter	<330	<330
2nd Quarter	<330	<330
3rd Quarter	<330	<330
4th Quarter	190±190	<330

GAMMA EMITTERS in COMPOSITE DISCHARGE BASIN SAMPLES
 (Monthly Composites)
1983

<u>Composite Period</u>	<u>pCi/l</u> <u>Gamma Emitters</u>
January	<15
February	<15
March	<15
April	<15
May	<15
June	<15
July	<15
August	<15
September	<15
October	<15
November	<15
December	<15

TRITIUM in COMPOSITE DISCHARGE BASIN SAMPLES
 (Quarterly Composites)
1983

	<u>pCi/l</u>
1st Quarter	<330
2nd Quarter	<330
3rd Quarter	<330
4th Quarter	<330

MISSISSIPPI POWER AND LIGHT
 RADIONUCLIDES IN WELL WATER SAMPLES
 (Quarterly Collections)
 1983

Collection Period	pCi/l			
	TRIMWELL		PGWELL	
	<u>γ Emitters</u>	<u>Tritium</u>	<u>γ Emitters</u>	<u>Tritium</u>
1st Quarter	<15	<330	<15	<330
2nd Quarter	<15	<330	<15	<330
3rd Quarter	<15	<330	<15	<330
4th Quarter	<15	<330	<15	<330

	pCi/l			
	MPWELL		LAKE BRUIN STATE PARK	
	<u>γ Emitters</u>	<u>Tritium</u>	<u>γ Emitters</u>	<u>Tritium</u>
1st Quarter	<15	<330	<15	<330
2nd Quarter	<15	<330	<15	<330
3rd Quarter	<15	<330	<15	<330
4th Quarter	<15	<330	<15	<330

MISSISSIPPI POWER AND LIGHT

GAMMA EMITTERS in FRUIT and VEGETABLE SAMPLES
(Collected at Harvest)

<u>Collection ID</u>	<u>Collection Date</u>	<u>Sample Type</u>	<u>pCi/g wet Gamma Emitters</u>
B Sector 30 KM	01/17/83	Mustard Green/ Turnip Green	<0.08
B Sector 30 KM	01/17/83	Turnip Roots	<0.08
Lake Claiborne, E-35	02/10/83	Mustard Greens	<0.08
Sector J 0.5 mi (adjacent to MP&L Garden)	04/15/83	Skunk Cabbage	<0.08
Sector J 0.5 mi (adjacent to MP&L Garden)	04/15/83	Skunk Cabbage	<0.08
Sector J. 0.5 mi (MP& L Garden)	05/16/83	Turnips/Mustards	<0.08
Sector J Veg-01	06/09/83	Radish	<0.08
" Veg-02	"	Turnip Green	<0.08
" Veg-03	"	Mustard Green	<0.08
MP&L Garden Veg-01	07/06/83	Grape	<0.08
" Veg-02	"	Apple Leaves	<0.08
" Veg-03	"	Pear Leaves	<0.08
Datsam (Willis Lake Claiborne)	"	Cucumber Leaves	<0.08
MP&L Garden Veg-01	08/09/83	Peach Leaves	<0.08
Glodjo Garden Veg-02	08/09/83	Purple Hull Pea Leaves	<0.08
Bullen Garden Veg-03	08/09/83	Corn Leaves	<0.08
Glodjo Garden Veg-01	09/08/83	Pear Trees Leaves	<0.08
MP & L Garden Veg-02	09/08/83	Cottonwood Tree Leaves	<0.08
Glodjo Garden Veg-03	09/08/83	Pea Vine Leaves	<0.08
Nelson Farm Veg-Cont E-5	09/08/83	Collards	<0.08

MISSISSIPPI POWER AND LIGHT

GAMMA EMITTERS in FRUIT and VEGETABLE SAMPLES
(Collected at Harvest)

<u>Collection ID</u>	<u>Collection Date</u>	<u>Sample Type</u>	<u>pCi/g wet Gamma Emitters</u>
Glodjo Garden	10/14/83	Pear Tree Leaves	<0.08
MP & L Garden	10/14/83	Cottonwood Tree Leaves	<0.08
MP & L Orchard	10/14/83	Apple Tree Leaves	<0.08
Nelson Farm E-5	10/14/83	Collards	<0.08
MP & L Orchard	11/08/83	Skunk Cabbage	<0.08
Lake Claiborne	11/08/83	Mustard Greens	<0.08
MP & L Orchard	12/07/83	Skunk Cabbage	<0.08
Lake Claiborne	12/07/83	Mustard Greens	<0.08

MISSISSIPPI POWER AND LIGHT

GAMMA EMITTERS IN SEDIMENT SAMPLES
(Semiannual Collections)

<u>Collection Site</u>	<u>Collection Date</u>	<u>pCi/g dry</u>	
		<u>Cs-137</u>	<u>Gamma Emitters</u>
GGNS Barge Slip	04/21/83	0.2±0.1	<0.15
Hamilton Lake Outfall	04/21/83	<0.15	<0.15
Cont-01 1000 yds up Barge	11/17/83	0.2±0.1	<0.15
Bar-03 Barge slip south	11/17/83	0.4±0.1	<0.15
Ham-05 Ham lake outfall	11/17/83	<0.15	<0.15

MISSISSIPPI POWER AND LIGHT

GAMMA EMITTERS IN FISH SAMPLES
(Semi-Annual Collections)

<u>Collection Site</u>	<u>Collection Date</u>	<u>Species</u>	<u>pCi/g (wet) Gamma Emitters</u>
MR UP	05/11/83	Catfish	<0.13
MR DOWN	05/11/83	Catfish	<0.13
MR UP	12/15/83	Buffalo	<0.13
MR DOWN	12/15/83	Buffalo	<0.13

GAMMA EMITTERS IN MEAT SAMPLES
(Semi-Annual Collections)
1983

<u>Collection Site</u>	<u>Collection Date</u>	<u>Sample Type</u>	<u>pCi/g (wet)</u>	
			<u>Gamma Emitters</u>	<u>Fe-59 Zn-65</u>
Buck Snort Camp (sector N 1.8)	12/07/83	Venison	<0.13	<0.26

MISSISSIPPI POWER AND LIGHT

SPECIAL SAMPLES

<u>Sample Type</u>	<u>Collection Site</u>	<u>Collection Date</u>	<u>Analysis</u>	<u>Data</u>
Fish	MR UP	06/16/83	Gamma Emitters	<0.13 pCi/g wet
Water	Resin Pond	08/19/83	Gamma Emitters	<15 pCi/l
Water	Specs Am 02 Perched Aquifer Well M W-6	09/15/83	Gamma Emitters	<15 pCi/l

MISSISSIPPI POWER AND LIGHT

Gamma Emitters In Soil Samples

Collection Site	Collection Date	pCi/g dry	
		Cs-137	Gamma Emitters
Datsam 1 (0-2cm)	07/13/83	<0.15	<0.15
Datsam 1 (2-4cm)	07/13/83	<0.15	<0.15
Datsam 1 (4-6cm)	07/13/83	<0.15	<0.15
Datsam 2 (0-2cm)	07/13/83	0.6±0.2	<0.15
Datsam 2 (2-4cm)	07/13/83	0.2±0.1	<0.15
Datsam 2 (4-6cm)	07/13/83	0.3±0.1	<0.15
Datsam 3 (0-2cm)	07/13/83	1.1±0.2	<0.15
Datsam 3 (2-4cm)	07/13/83	0.6±0.2	<0.15
Datsam 3 (4-6cm)	07/13/83	0.3±0.1	<0.15

1983

MISSISSIPPI POWER AND LIGHT

LIST OF REPLICATE SAMPLES

<u>Sample Type</u>	<u>Location</u>	<u>Date Collected</u>	<u>Analysis</u>	<u>Data</u>
Milk	Alcont GG	03/03/83	Gamma Emitters	<15 pCi/l
Surface Water	MR DOWN GG	03/17/83	Gamma Emitters	<15 pCi/l
Surface Water	MR UP GG	03/17/83	Gamma Emitters	<15 pCi/l
Cistern Water	TRIM CIST GG	03/03/83	Gross Beta	<1 pCi/l
Cistern Water	WILL CIST GG	03/01/83	Gross Beta	2±1 pCi/l
Fish	MR UP GG	05/11/83	Gamma Emitters	<0.13 pCi/g
Fish	MR DOWN GG	05/11/83	Gamma Emitters	<0.13 pCi/g
Cistern Water	WILL CIST GG	06/06/83	Gross Beta	<1 pCi/l
Cistern Water	TRIM CIST GG	06/06/83	Gross Beta	3±2 pCi/l
Milk	Alcont GG	06/06/83	Iodine-131	<1 pCi/l
Surface Water	MR UP GG	06/23/83	Gamma Emitters	<15 pCi/l
Surface Water	MR DOWN GG	06/23/83	Gamma Emitters	<15 pCi/l
Milk	Alcont GG	09/06/83	Gamma Emitters	<15 pCi/l
Surface Water	MR UP GG	09/22/83	Gamma Emitters	<15 pCi/l
Surface Water	MR DOWN GG	09/22/83	Gamma Emitters	<15 pCi/l
Cistern Water	TRIM CIST GG	09/08/83	Gross Beta	5±2 pCi/l
Cistern Water	WILL CIST GG	09/06/83	Gross Beta	2±1 pCi/l
Ground Water	TRIMWELL GG	10/12/83	Gamma Emitters	<15 pCi/l
Ground Water	TRIMWELL GG	4th Qtr.	Tritium	<330 pCi/l
Ground Water	PG WELL GG	10/12/83	Gamma Emitters	<15 pCi/l
Ground Water	PG Well GG	4th Qtr.	Tritium	<330 pCi/l
Ground Water	Datsam GGMP	10/12/83	Gamma Emitters	<15 pCi/l
Ground Water	Datsam GGMP	4th. Qtr.	Tritium	<330 pCi/l
Milk	Alcont GG	10/26/83	Gamma Emitters	<15 pCi/l
Milk	Alcont GG	10/26/83	Iodine-131	<1 pCi/l
Sediment	1000 yds UP	11/17/83	Gamma Emitters	<0.15 pCi/g(a)
Sediment	Barge Slip Southside	11/17/83	Gamma Emitters	<0.15 pCi/g(b)
Sediment	Ham Lake outfall	11/17/83	Gamma Emitters	<0.15 pCi/g
Milk	Alcont GG	12/09/83	Gamma Emitters	<15 pCi/l
Milk	Alcont GG	12/09/83	Iodine-131	<1 pCi/l
Cistern Water	TRIM CIST GG	12/12/83	Gross Beta	
Cistern Water	WILL CIST GG	12/12/83	Gross Beta	
Surface Water	MR UP GG	12/15/83	Gamma Emitters	<15 pCi/l
Surface Water	MR DOWN GG	12/15/83	Gamma Emitters	<15 pCi/l
Fish	MR UP GG	12/15/83	Gamma Emitters	<0.13 pCi/g
Fish	MR DOWN GG	12/15/83	Gamma Emitters	<0.13 pCi/g
Cistern Water	TRIM CIST GG	12/12/83	Iodine-131	<1 pCi/l
Cistern Water	WILL CIST GG	12/12/83	Iodine-131	<1 pCi/l

(a) Cs-137 = 0.3±0.1 pCi/g (b) Cs-137 = 0.1±0.1 pCi/g

MISSISSIPPI POWER AND LIGHT

LISTING OF MISSED SAMPLES

1983

<u>Sample Type</u>	<u>Location</u>	<u>Expected Collection Date</u>	<u>Reason</u>
AP/CC	AS-04	01/11/83	Sampler out of service
AP/CC	AS-04	01/17/83	Sampler out of service
AP/CC	AS-09	01/17/83	Unit was not restarted
TLD	M-24	1st Quarter	Missing
TLD	M-34	1st Quarter	Missing
TLD	M-40	1st Quarter	Missing
AP/CC	AS-02	06/14/83	Out of service
TLD	M-10	2nd Quarter	Missing
TLD	M-50	2nd Quarter	Missing
AP/CC	AS-10	10/04/83	Sampler out of service
AP/CC	AS-02	10/11/83	Sampler out of service
AP/CC	AS-02	10/18/83	Sampler out of service
TLD	M-11	3rd Quarter	Missing
TLD	M-18	3rd Quarter	Missing
TLD	M-49	3rd Quarter	Missing
TLD	M-60	3rd Quarter	Missing
TLD	M-70	3rd Quarter	Missing
TLD	M-10	4th Quarter	Missing
TLD	M-34	4th Quarter	Missing
TLD	M-41	4th Quarter	Missing
TLD	M-58	4th Quarter	Missing
TLD	M-38	4th Quarter	Missing
Milk	Alcont	December (second sample)	School dairy was closed for holidays.
Broad Leafy Veg.	Sector J	January	Not Available
	Control	January	One sample was not available
	Sector J	February	Not Available
	Control	February	Not Available
	Sector J	March	Not Available
	Control	March	Not Available
	Sector J	April	One sample was not available
	Control	April	Not Available
	Sector J	May	2 samples were not available
	Control	May	Not Available
	Control	June	Not Available
	Control	July	Not Available
	Sector J	August	Not Available
	Control	August	Not Available



MISSISSIPPI POWER & LIGHT COMPANY
Helping Build Mississippi

P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

April 27, 1984

JAMES P. MCGAUGHY, JR.
VICE PRESIDENT

U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N.W., Suite 2900
Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly,
Regional Administrator

Dear Mr. O'Reilly:

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-13
File: 0292/15322
Annual Radiological
Environmental Operating
Report for 1983
AECM-84/0262

In accordance with Grand Gulf Nuclear Station's (GGNS) Unit 1
Technical Specifications, we are enclosing one copy of the Annual
Radiological Environmental Operating Report for the period January 1,
1983, through December 31, 1983.

Questions concerning the technical content of this report should be
referred to Dr. L. R. McKay, Manager of Radiological & Environmental
Services, at (601) 969-2432.

Yours truly,

JPM:aly
Attachments

cc: Mr. J. B. Richard (w/a)
Mr. R. B. McGehee (w/o)
Mr. N. S. Reynolds, (w/o)
Mr. G. B. Taylor (w/o)

Mr. Richard C. DeYoung, Director (w/a)
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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Mr. J. E. Cross (w/a)
Mr. S. M. Feith (w/a)
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Mr. M. D. Archdeacon (w/o)
Mr. W. E. Edge (w/2)
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Mr. L. F. Dale (w/a)
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Dr. L. R. McKay (w/a)
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File (Plant) (w/a)
File (Project) (w/a) [113]