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April 5, 1996

U.S. Nuclear Regulatory Commission
Mail Station P1-37
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station
Docket No. 50-416
License No. NPF-29
Annual Radiological Environmental Operating Report for 1995

GNRO-96/00034

Gentlemen:

In accordance with the Grand Gulf Nuclear Station Unit 1 Technical Specification 5.6.2, attached is the Annual Radiological Environmental Operating Report for the period January 1, 1995 through December 31, 1995.

Yours truly,

C. R. Hutchinson

CRH/MJL/ams
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GRAND GULF NUCLEAR STATION

1995 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

Summary

The Annual Radiological Environmental Operating Report (AREOR) presents Grand Gulf Nuclear Station (GGNS) Environmental Surveillance Program (ESP) data obtained through analyses of environmental samples collected for the period January 1, 1995 through December 31, 1995. The AREOR fulfills the requirements of GGNS Technical Specifications 5.6.2.

During 1995 and as in previous years, GGNS detected plant-related radionuclides in the discharge basin surface water (Manganese-54, Cobalt-60 and Tritium) and barge slip sediment (Manganese-54, Cobalt-58, Cobalt-60 and Cesium-137). GGNS personnel routinely monitor results from these areas to note any trends. Their 1995 review of these areas over previous years indicates the following:

- Manganese-54 and Cobalt-60 levels in the discharge basin surface water are not demonstrating any increase above the required lower limits of detection values outlined in the Offsite Dose Calculation Manual (ODCM) Specifications.
- Tritium levels in the discharge basin surface water have increased due to increased levels in the reactor coolant and radioactive effluents caused by stress corrosion cracking of control blade absorber tubes. This has resulted in a pathway for the release of boron. Subsequently, tritium production results from the neutron activation. Reduction in tritium levels can be expected as control blades are gradually replaced and the number of blades above 20% depletion is reduced. No regulatory limits for radioactive effluents have been exceeded.

- Radionuclides in the barge slip sediment appear to be stabilizing as compared to previous years.

Section 2.0 of this report provides a discussion of these results.

GGNS personnel also made modifications to the ESP during 1995 as result of updating the atmospheric deposition rates and evaluation of historical data obtained from supplemental locations. These included:

- Relocating air sampling stations AS-6 RS (Sector C, Radius 0.5 miles) and AS-7 MT (Sector A, Radius 0.9 miles) to AS-6 BF (Sector K, Radius 0.4 miles) and AS-7 UH (Sector H, Radius 0.5 miles), respectively.
- Relocating Sector R garden to Sector H.
- Discontinuing supplemental air sampling stations AS-4 GJOE, AS-8 WR, AS-10 HR and AS-11 BB.

Environmental Surveillance Program

GGNS established the ESP in 1978 before the station became operational (1985) to provide data on background radiation and radioactivity normally present in the area. GGNS has continued to monitor the environment by sampling air, milk, water, vegetation, sediment and fish, as well as measuring radiation directly.

The ESP includes sampling indicator and control locations within an 18-mile radius of the plant. The ESP utilizes indicator locations near the site to show any increases or buildup of radioactivity that might occur due to station operation, and control locations farther away from the site to indicate the presence of only naturally occurring radioactivity. GGNS personnel compare indicator results with control and preoperational results to assess any impact GGNS operation might have had on the surrounding environment.

Excluding duplicate samples, GGNS personnel collected 1,028 environmental samples during 1995 and had them analyzed for radioactivity. They compared results of indicator locations with control locations and previous studies, and concluded that overall no significant relationship exists between GGNS operation and effect on the plant environs. Their review of 1995 data, in many cases, showed undetectable radiation levels in the environment and near background levels in significant pathways associated with GGNS, with exception of the tritium levels detected in the discharge basin surface water. Therefore, they concluded that GGNS operation has had no harmful effects or irreversible damage to the environment.

Attachments

Attachment I contains results of air, milk, water, vegetation, sediment and fish samples collected in 1995 and analyzed by Entergy Services, Inc., (ESI) System Chemistry Section. It also includes ESI System Chemistry's results in the Environmental Protection Agency (EPA) Interlaboratory Comparison Program.

Attachment II contains results of thermoluminescent dosimeters (TLDs) collected in 1995 and analyzed by Waterford3's Dosimetry Section.

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

SECTION 1.0

INTRODUCTION

1.1 Radiation

People are always subjected to natural radiation. This radiation exposure comes from the sun and naturally occurring radioactive materials present in the earth, structures we inhabit, and in the food and water we consume. There are radioactive gases in the air we breathe and our bodies are themselves radioactive. The levels of natural or background radiation vary greatly from location to location. The average United States resident receives approximately 300 millirem a year from natural background as shown in Table 1-1.

In addition, man-made sources of radiation, such as X-rays, radiation for medical purposes, fallout from nuclear explosives testing and radioactive materials from nuclear power plants contribute additional exposure. However, as shown in Table 1-1, an individual receives the major portion of dose from natural background and other sources with nuclear power plants contributing <1.0 millirem. This would also be the case for individuals living around or next to GGNS.

1.2 Benefits of Radiation

Nuclear power plays an important part in meeting today's electricity needs and will continue to serve as an important source of energy well into the future. In addition, other uses of radiation have brought tremendous benefits to our everyday lives during the past 20 or 30 years. Radioisotopes and controlled radiation are used, for example, to sterilize medical supplies, to improve the keeping qualities of foods, in industrial processes, in medical science, and in the study of environmental pollution, agriculture and hydrology. Medical diagnosis and treatment are the main sources of public exposure to man-made radiation, but the benefit in terms of human lives and health is enormous.

1.3 Radiation Perspectives

Although it is not generally realized, radioactive materials from nuclear power plants are strictly regulated, while naturally occurring radiation is to the most part, unregulated; however, as shown in Table 1-1, the public receives more exposure to naturally occurring radiation. For example, a person living near a 1000 MWe coal fired plant could receive 7.2 millirem in a year from naturally occurring radioactive materials contained in the coal that is burned. A person living adjacent to a similar sized nuclear plant is expected to receive <1.0 millirem in a year.

In addition, radioactive elements lose their radioactivity, and resulting toxicity, with time. In comparison, potentially toxic non-radioactive materials, such as lead and mercury, can present a danger to humans until properly treated, stabilized, and disposed.

1.4 Environmental Surveillance Program Purpose and Design Criteria

GGNS established the ESP to minimize any associated radiation endangerment to human health or the environment by ensuring that plant operating controls function properly. The ESP purpose involves:

- Evaluating environmental sampling procedures, equipment and techniques
- Measuring radiation levels and their variations in environmental media in the area surrounding the plant
- Determining average levels of radiation and radioactive material in various environmental media
- Detecting effects, if any, of GGNS operation on the environmental radiation levels and concentrations.

The ESP design criteria includes:

- Analyzing important pathways for anticipated types and quantities of radionuclides released into the environment
- Considering the possibility of a buildup of long-lived radionuclides in the environment and identifying physical and biological accumulations that may contribute to human exposures
- Considering the potential radiation exposure to plant and animal life in the environment surrounding GGNS
- Correlating levels of radiation and radioactivity in the environment with radioactive releases from station operation.

1.5 Dose Pathways Associated with GGNS

Figure 1-1 shows potential exposure pathways that could occur as a result of a nuclear power plant. However, direct dose from gaseous effluent and thyroid dose from ingesting milk involves the most significant environmental dose pathways from a nuclear power station. GGNS operations have little, if any, impact on these pathways due to very low levels of radiation released, remote location and absence of milking animals within five miles of GGNS. In addition, the GGNS Final Environmental Report lists the first use of drinking water from the Mississippi River as more than 200 miles downstream. Therefore, GGNS operations have little, if any, impact on this pathway.

1.6 Pathways Monitored

The ESP includes the sampling program for monitoring airborne, waterborne, ingestion and direct radiation pathways as required by Table 6.12.1-1 in the ODCM. GGNS supplements this program with additional

sampling in order to provide a comprehensive and well-balanced program. Tables 1-2 through 1-5 provide a description of the GGNS ESP sample locations. Only sample locations required by the ODCM are keyed to Figures 1-2 and 1-3 as shown in the Tables.

1.7 Previous Data Comparison

GGNS personnel observed only one significant change between 1995 results and those from previous years. Tritium levels in the discharge basin continue to be elevated due to stress corrosion cracking of the control blade absorber tubes. This has resulted in a pathway for the release of boron into the reactor water, thereby producing tritium. All other REMP results remained at levels similar to those of previous years. Such results confirm proper functioning of GGNS effluent controls and equipment.

TABLE 1-1

Radiation Risks

Radiation Risks In Perspective

Radiation Dose Comparisons

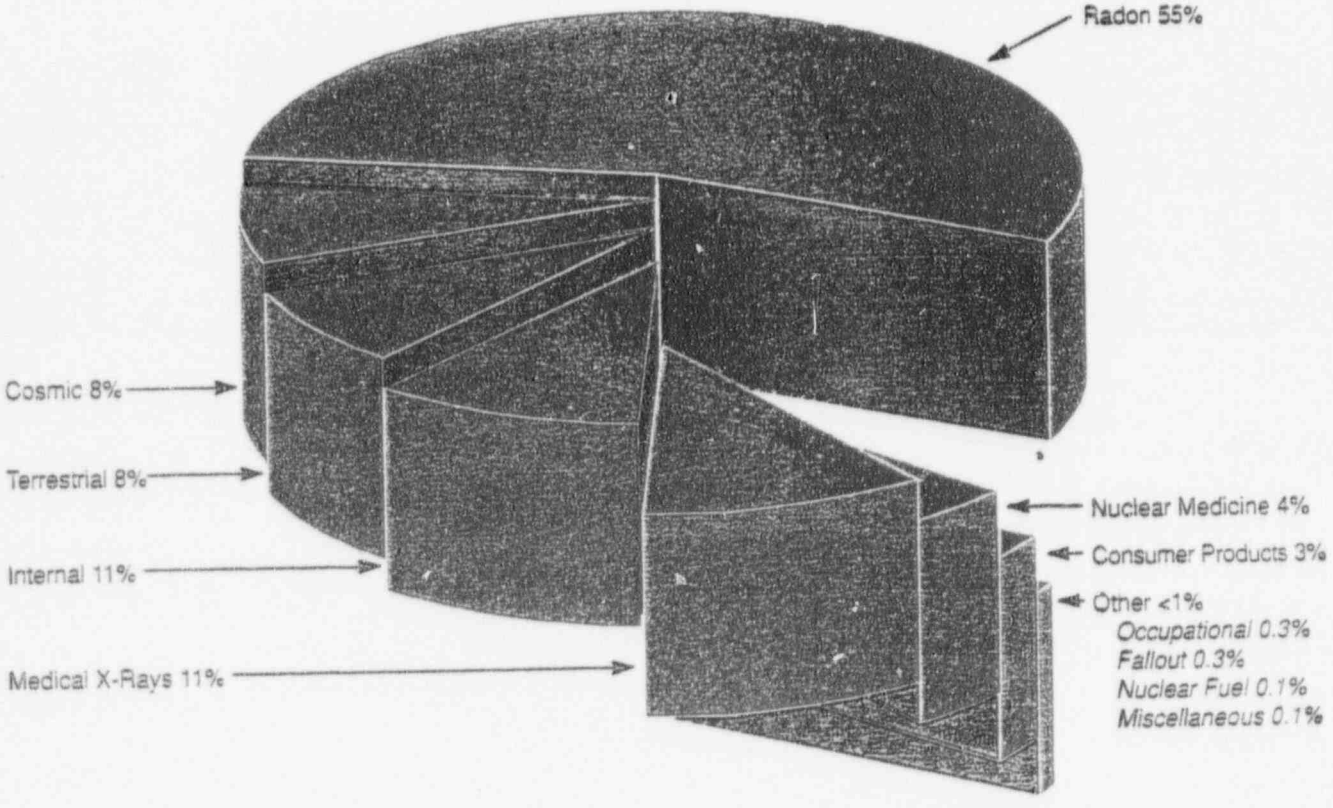
Natural Background	Approximate MREM/Year
Average U.S. Resident	300
Average Denver Resident	380
Radon in average households	
New York/New Jersey	360
Massachusetts	475
Medical Exposure	
Average U.S. Citizen	50
Typical Medical Examination	
Dental X-Rays *(Full Mouth)*	3,000 *(Skin)*
Chest X-Rays	10 *(Bone)*
Gastro-Intestinal Series *(Upper & Lower)*	1,400 *(Bone)*
Occupational Exposure	
Average Pilgrim Station Radiation Worker *(since 1980)*	600 MREM/Year

Estimated Loss of Average Life

Expectancy From Various Health Risks

Health Risk	Estimated Days of Life Expectancy Lost (average)
Smoking 20 Cigarettes/Day	2370 *(6.5 years)*
Overweight *(by 20%)*	985 *(2.7 Years)*
All Accidents Combined	435 *(1.2 Years)*
Auto Accidents	200
Alcohol Consumption *(U.S. Average)*	130
Home Accidents	95
Drowning	41
Natural Background Radiation	8
Medical Diagnostic X-Rays *(U.S. Average)*	6
All Catastrophes *(Earthquake, Etc.)*	3.5
One REM Radiation	1

Background Radiation Sources



The percentage contribution of various radiation sources to the total average effective dose equivalent in the U.S. population.

BOSTON EDISON

TABLE 1-2

Air Sample Locations

Air Sampler Number	Figure	Location
AS-1 PG	1-3	Southeast of GGNS at the Port Gibson City Barn (Sector G, Radius 5.5 miles)
AS-3 61VA	1-3	North-northeast of GGNS on Hwy 61, north of the Vicksburg Airport (Sector B, Radius 18 miles)
AS-4 GJOE	Not Shown	Southwest of GGNS, Glodjo property on Bald Hill Road (Sector L, Radius 0.9 miles)
AS-5 TC	1-2	South of GGNS at the former Training Center (Sector J, Radius 0.4 miles)
AS-6 RS	Not Shown	Northeast of GGNS, south side of Grand Gulf Road (Sector C, Radius 0.5 miles)
AS-6 BF	1-2	South-southwest of GGNS at the GGNS Ball Field (Sector K, Radius 0.4 miles)
AS-7 MT	Not Shown	North-northwest of GGNS, located next to the Meteorological Tower (Sector A, Radius 0.9 miles)
AS-7 UH	1-2	South-southeast of GGNS at the IBEW Union Hall (Sector H, Radius 0.5 miles)
AS-8 WR	Not Shown	East of GGNS, located on Bald Hill Road near the eastern SITE BOUNDARY (Sector E, Radius 0.6 miles)
AS-10 HR	Not Shown	Near County Road/Heavy Haul Road intersection (Sector P, Radius 0.8 miles)
AS-11 BB	Not Shown	Near influent end of Basin B (Sector M, Radius 0.3 miles)

TABLE 1-3

TLD Locations

TLD No.	Location	Figure	Sector	Mile
M-00	Maintained in lead shield during the exposure period	-	-	-
M-01	Across the road from Lake Claiborne entry gate	1-2	E	3.5
M-07	AS-1 PG, Port Gibson City Barn	1-3	G	5.5
M-09	Warner Tully Y-Camp	1-2	D	3.5
M-10	Grand Gulf Military Park	1-2	A	1.5
M-14 (Control)	AS-3-61VA, Hwy 61, north of Vicksburg Airport	1-3	B	18.0
M-16	Meteorological Tower	1-2	A	0.9
M-17	South side, Grand Gulf Road	1-2	C	0.5
M-19	Eastern SITE BOUNDARY property line, NNE of HWSA	1-2	E	0.5
M-20	Hazardous waste storage area (HWSA)	1-2	F	0.5
M-21	AS-5-TC, near former Training Center Building, on Bald Hill Road	1-2	J	0.4
M-22	Former RR entrance crossing on Bald Hill Road	1-2	G	0.5
M-23	Gin Lake Road 50 yards north of Heavy Haul Road on power pole	1-2	Q	0.5

TABLE 1-3

TLD Locations

TLD No.	Location	Figure	Sector	Mile
M-25	Radial Well Number 1	1-2	N	1.6
M-27	WSW near SITE BOUNDARY property line, (Near Bucksnort Road)	1-2	M	1.5
M-28	Former Glodjo residence	1-2	L	0.9
M-31	Duplicate TLD installed quarterly at varying locations	-	-	-
M-32	Duplicate TLD installed quarterly at varying locations	-	-	-
M-33 (Control)	Newellton, Louisiana, Water Tower	1-3	P	12.5
M-36	Curve on HW 608, point nearest GGNS at power pole	1-2	P	5.0
M-38	Lake Bruin State Park, entrance road	1-3	M	9.5
M-39	St. Joseph, Louisiana, Aux. Water Tank	1-3	M	13.0
M-40	International Paper Road, South of River Mile Marker	1-2	M	5.0
M-41	Radial Well Number 4	1-2	P	1.3
M-45	Old Visitor Center gate	1-2	D	0.5

TABLE 1-3

TLD Locations

TLD No.	Location	Figure	Sector	Mile
M-47	Bridge 0.6 miles west of Rodney-Westside Road/ Mont Gomer Road intersection, north side	1-3	L	5.2
M-48	0.4 miles South on Mont Gomer Road on west side	1-2	K	4.8
M-49	Fork in Bessie Weathers Road/ Shaifer Road	1-2	H	4.5
M-50	Panola Hunting Club entrance	1-3	B	5.3
M-51	Ingelside Karnac Ferry Road between Deer Camp Road and Y-Camp Road	1-2	C	4.2
M-55	Near Ingelside Karnac Ferry Road/ Ashland Road Intersection	1-2	D	5.0
M-56	H.W. Watson Elementary and Junior High School	1-2	G	4.2
M-57	Hwy 61, behind the Welcome to Port Gibson sign at Glensdale Subdivision	1-2	F	4.5
M-58	Hwy 61, Big Bayou Pierre bridge, southeast end	1-2	E	5.0
M-59	Off levee at Winter Quarters Hunting camp	1-3	N	5.1
M-60	Duplicate TLD installed quarterly at varying locations	-	-	-

TABLE 1-3

TLD Location

TLD No.	Location	Figure	Sector	Mile
M-61	Protected area fence	Not Shown	D	Onsite
M-62	Protected area fence	Not Shown	E	Onsite
M-63	Protected area fence	Not Shown	N	Onsite
M-64	Protected area fence	Not Shown	M	Onsite
M-65	Protected area fence	Not Shown	L	Onsite
M-66	Protected area fence	Not Shown	K	Onsite
M-67	Protected area fence	Not Shown	J	Onsite
M-68	Protected area fence	Not Shown	H	Onsite
M-69	Protected area fence	Not Shown	G	Onsite
M-70	Protected area fence	Not Shown	F	Onsite
M-71	Protected area fence	Not Shown	C	Onsite
M-72	Protected area fence	Not Shown	B	Onsite

TABLE 1-3

TLD Locations

TLD No.	Location	Figure	Sector	Mile
M-74	Protected area fence	Not Shown	P	Onsite
M-76	Protected area fence	Not Shown	A	Onsite
M-77	Protected area fence	Not Shown	R	Onsite
M-81	Administration Building	Not Shown	Q	Onsite
M-86	North Site Access Road entrance near SITE BOUNDARY	1-2	B	0.5
M-88	River mile marker 409.5	1-2	A	4.2
M-89	Middle Ground Island	1-2	R	4.4
M-90	Across from Middle Ground Island, near Louisiana State Line (Yucatan cutoff of 1929)	1-2	Q	3.5
M-91	Transmission line by pond (Off Shaifer Road near Widows Creek)	1-2	J	4.5
M-92	Fence behind orchard (Bald Hill Road)	1-2	K	0.4
M-93	Underground cable sign (Bald Hill Road)	1-2	H	0.4
M-94	Sector R near Meteorological Tower	1-2	R	0.8

TABLE 1-4

Milk and Water Locations

Milk (Control Location)	Figure	Location
ALCONT	1-3	Located south-southwest of GGNS at Alcorn State University (Sector K, Radius 10.5 miles)
Cistern Water		
McGee Cistern	1-2	Located north of GGNS at the McGee house on Frazier Road (Sector A, Radius 0.9 miles)
Willis Cistern	1-3	Located at the C. E. Willis house on Shiloh Road east-northeast of GGNS near the the Shiloh Baptist Church (Sector D, Radius 6.0 miles)
Grand Gulf Road (Alternate Location)	Not Shown	Located at Hiram Wells residence on Grand Gulf Road (Sector E, Radius 0.7 miles)
Surface Water		
Upstream	1-2	At least 4500 ft upstream of the GGNS discharge point into the Mississippi River to allow adequate mixing of the Mississippi and Big Black Rivers (Sector Q-R, 1.8 miles)

TABLE 1-4

Milk and Water Locations

Surface Water (cont'd)	**Figure**	**Location**
Downstream	1-2	At least 5000 ft downstream of the GGNS discharge point into the Mississippi River near Radial Well No. 1 (Sector N, 1.6 miles)
Discharge Basin	1-2	West-northwest of GGNS in parking lot, YRD-133-PKG-LOT A (Sector P, 0.2 miles)
Groundwater		
PGWELL	1-2	PORT GIBSON WELLS - Taken from distribution system or one of the five wells (Sector G, Radius 5.0 miles)
AAWELL	1-2	Arnold Acres Well (Sector J, Radius 1.1 miles)

TABLE 1-5

Vegetation, Sediment and Fish Locations

Vegetation	Figure	Location
Broadleaf Vegetation	1-2	South of GGNS near former Training Center on Bald Hill Road (Sector J, 0.4 miles)
	1-2	North-northwest of GGNS near the Meteorological Tower (Sector R, 1.0 miles)
	1-2	South-southeast of GGNS between the former training center and the IBEW Union Hall on Bald Hill Road (Sector H, 0.4 miles)
	1-3	Alcorn State University south-southwest of GGNS (Sector K, 10.5 miles) when available, otherwise a location 15-30 km distant
Sediment		
SEDHAM	1-2	Downstream of the GGNS discharge point in the Mississippi River near Hamilton Lake outlet (Sector N, 1.6 miles)
SEDBAR	Not Shown	Barge slip (Sector Q, 1.5 miles)
SEDCONT	Not Shown	Upstream from the GGNS discharge point into the Mississippi River in the vicinity of upper Grand Gulf Landing (Sector R, 2.0 miles)

TABLE 1-5

Vegetation, Sediment and Fish Locations

Fish	Figure	Location
Fish and Invertebrates	1-2	Downstream of the GGNS discharge point into the Mississippi River
	1-2	Upstream of the GGNS discharge point into the Mississippi River uninfluenced by plant operations

FIGURE 1-1

Exposure Pathways

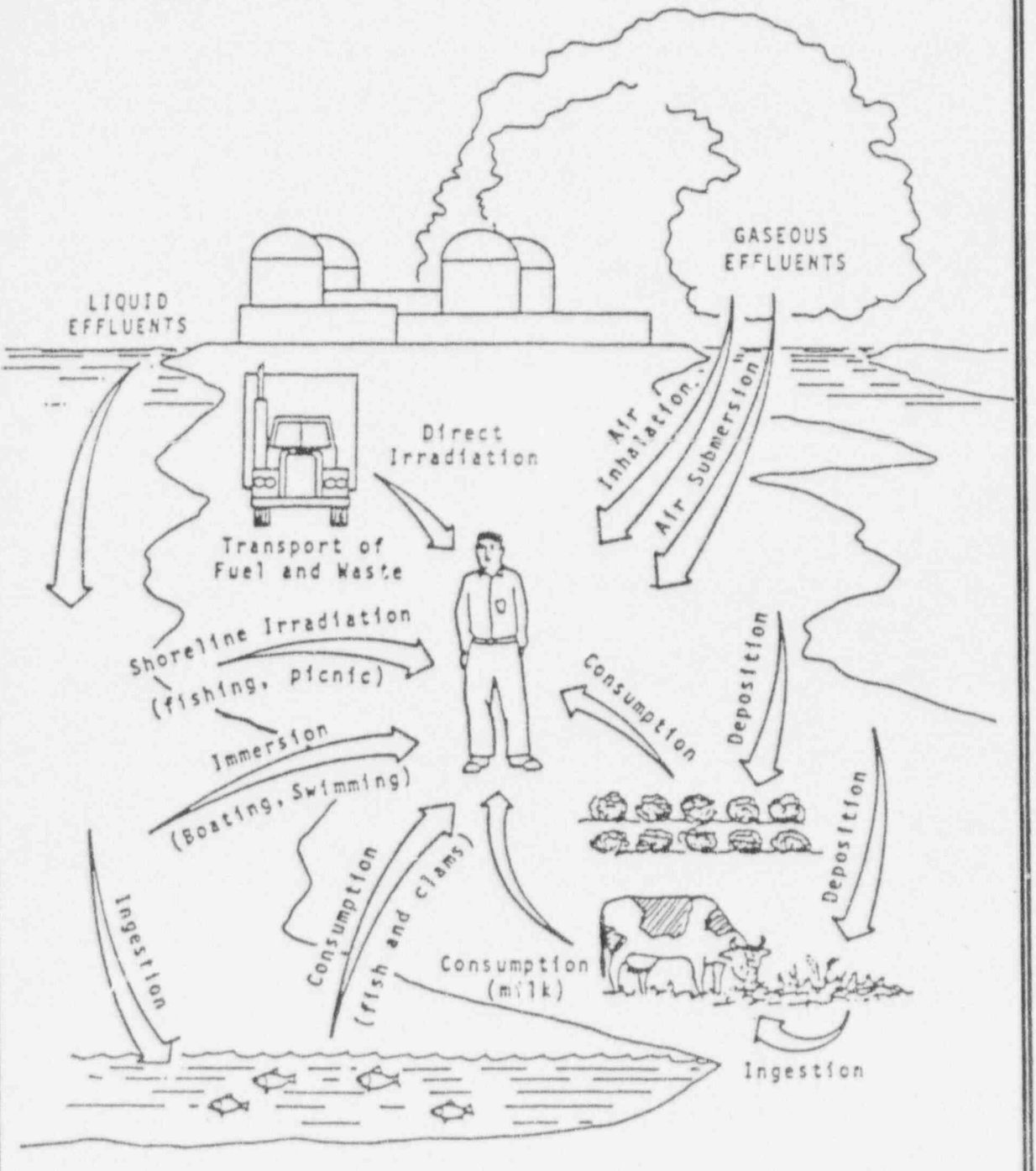


FIGURE 1-2

Sample Collection Sites - 5 Mile Map

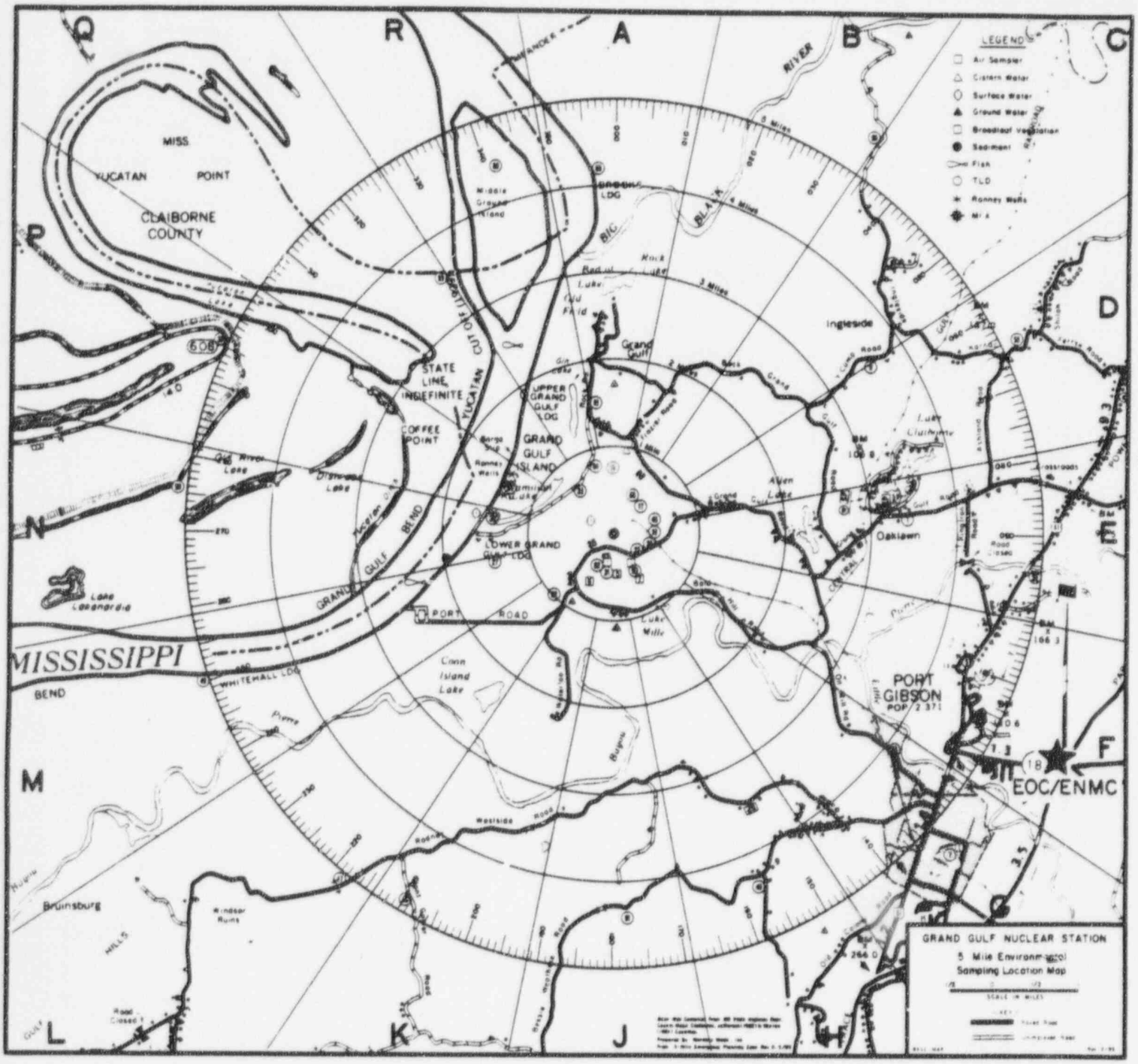
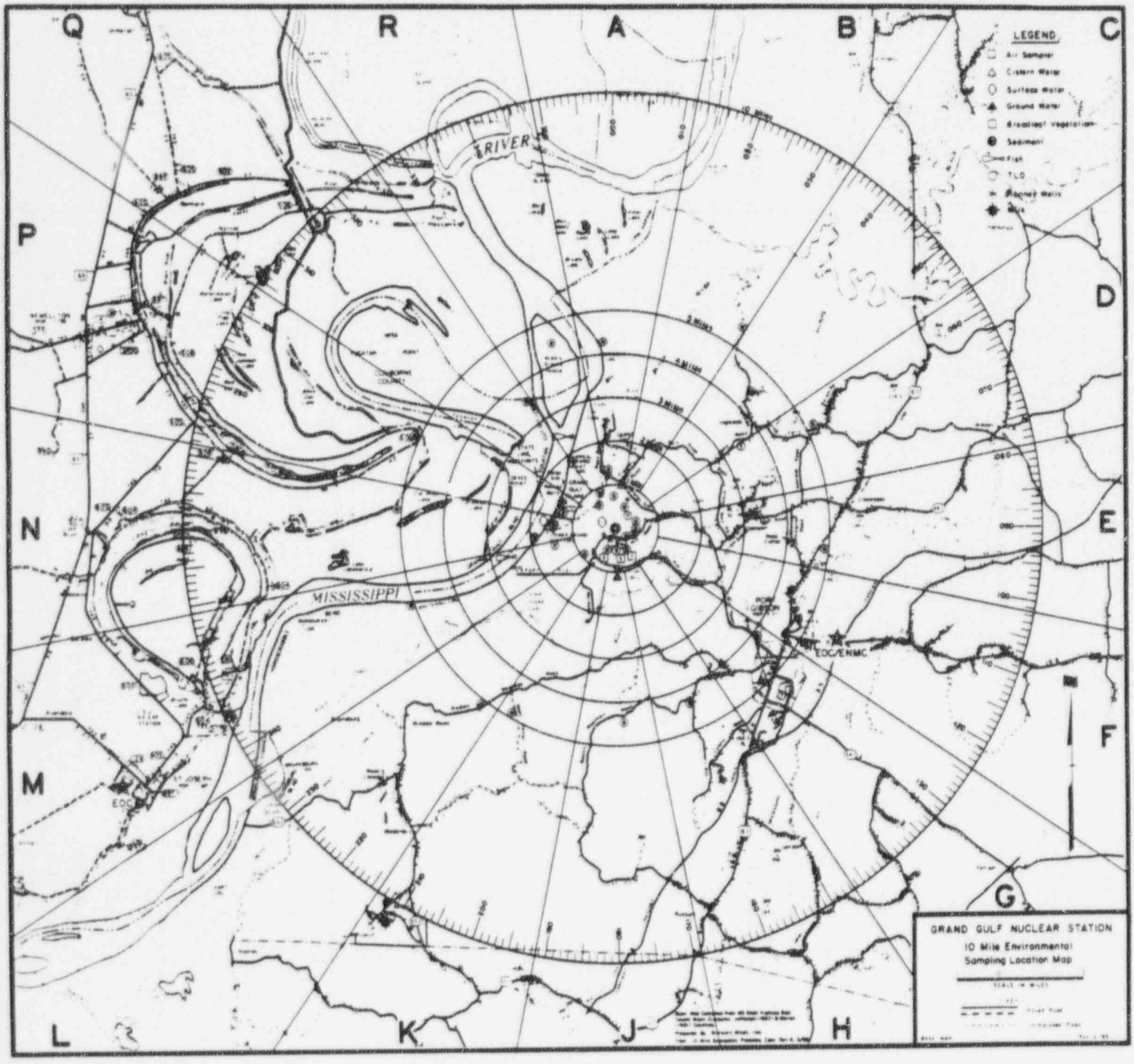


FIGURE 1-3

Sample Collection Sites - 10 Mile Map

18 MILES FROM GRAND GULF
TO VICKSBURG AIRPORT



SECTION 2.0

ENVIRONMENTAL SURVEILLANCE PROGRAM

- INTERPRETATIONS AND TRENDS OF RESULTS
- PROGRAM DESCRIPTION

2.1 AIR PARTICULATES AND RADIOIODINES

Note: Analytical results presented in Tables 1.1 through 1.13 of Attachment I and summarized in Section 4.0.

2.1.1 Interpretations and Trends of Results

Air particulate and Iodine-131 results for 1995 compare similarly to those obtained in previous years of the operational and preoperational ESP. Iodine-131 remained undetectable with gross beta concentrations for indicator locations ranging from 0.004 - 0.058 pCi/m^3 with a mean of 0.016 pCi/m^3 as compared to control locations which ranged from 0.006 - 0.039 pCi/m^3 with a mean of 0.018 pCi/m^3. These results indicate the airborne exposure pathway has not been affected by the operation of GGNS and that airborne concentrations continue to be at background levels.

Gross beta concentrations shown in Figure 2-1 further emphasize that GGNS has had no influence on ambient radiation levels. This figure shows 1995 monthly average results compared to preoperational results, and 1987 through 1995 annual average results for indicator locations compared to controls. Although GGNS personnel observed a small increase in activity for the month of September as compared to preoperational data, naturally occurring radionuclides present in the airborne pathway can vary due to climatic conditions and other factors, thereby affecting gross beta concentrations measured in the ambient air. Overall, values compare similarly over the period.

2.1.2 Program Description

At the beginning of 1995, the GGNS ESP utilized nine continuous air samplers to provide gross beta, gamma and radioiodine activity measurements by the airborne exposure pathway. However as a result of updating the atmospheric deposition rates and evaluation of historical data obtained from supplemental locations, GGNS personnel discontinued four air sampling locations during March 1995. The remaining five air samplers range in distance from 0.3 to 18 miles (Figures 1-2 and 1-3, and Table 1-2). These air samplers met the requirements of ODCM Specification 6.12.1, located as follows:

- Three near the SITE BOUNDARY in areas of the highest calculated annual average groundlevel D/Q values
- One in a community that has the highest calculated annual average groundlevel D/Q value (Port Gibson)
- One in a control location (Vicksburg, MS).

GGNS personnel placed air samplers one meter above the ground in weatherproof houses, with a 2-inch glass fiber filter in the intake line of the vacuum pump and a 2 x 1-inch charcoal cartridge located directly downstream. GGNS personnel maintained air flow at 1.25 cubic feet per minute. They changed filters and cartridges weekly and had them analyzed for gross beta radionuclides and radioiodine activity, respectively. The analytical contractor analyzed quarterly composites of air filters for gamma radionuclides.

Figure 2-1
Air Sample Gross Beta Concentrations

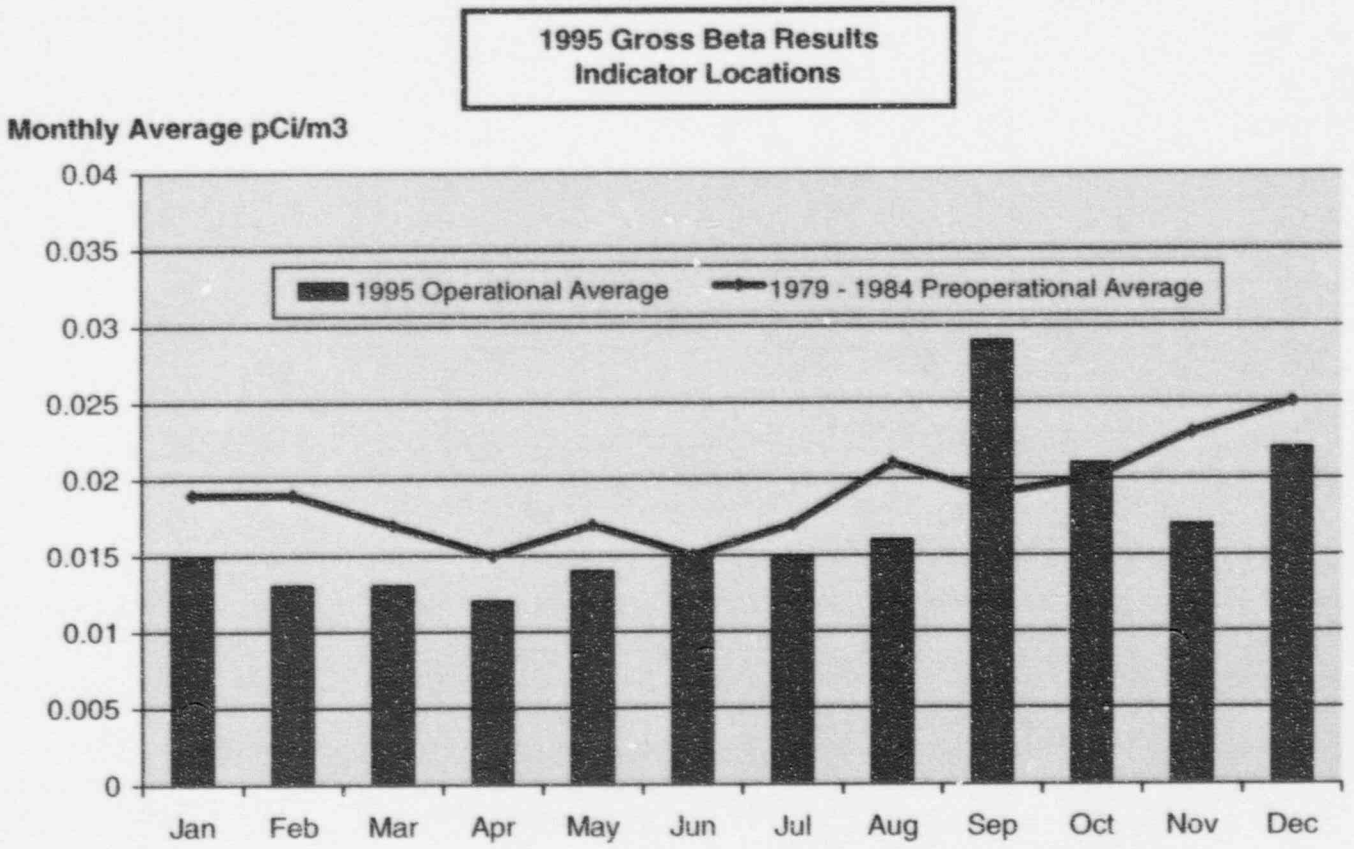
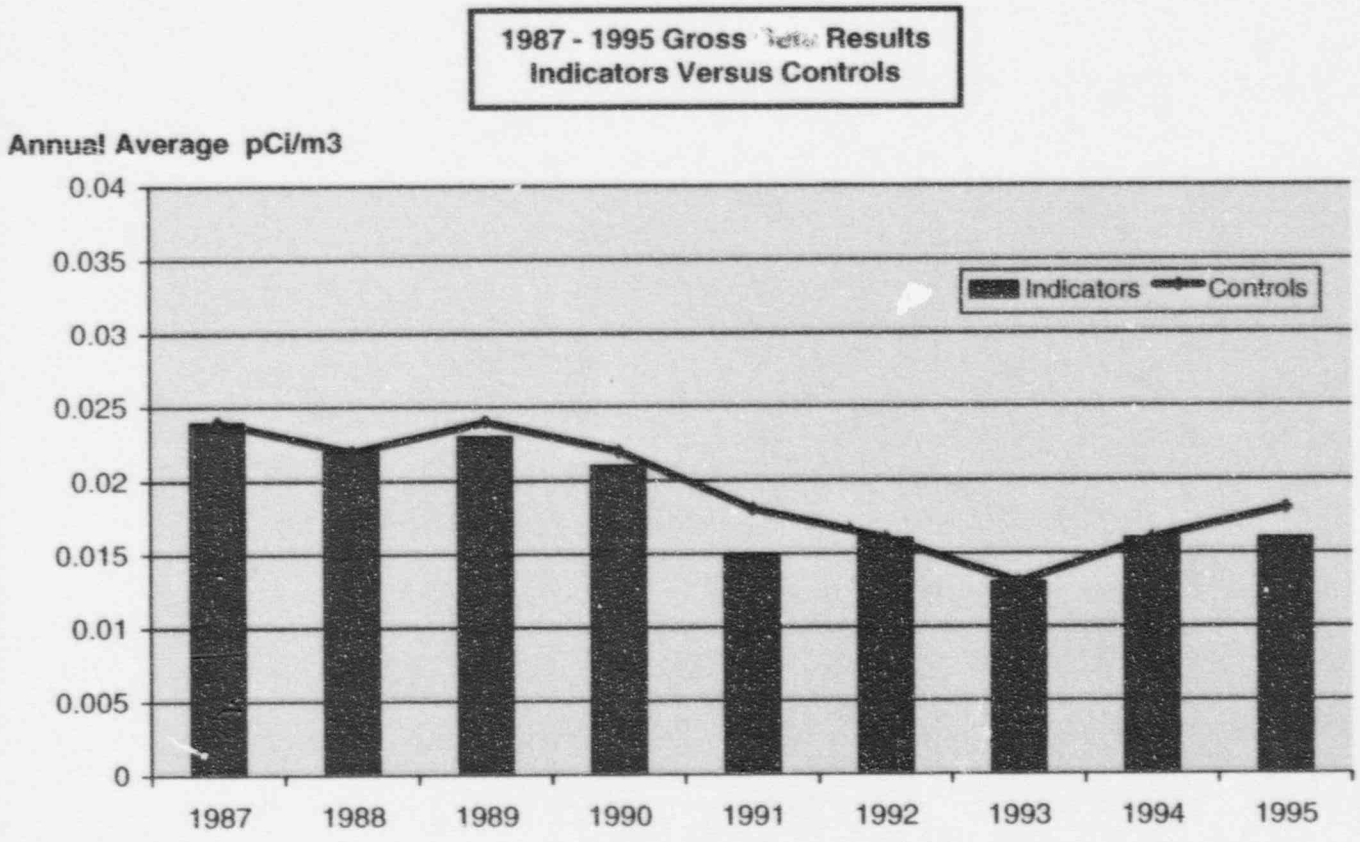


Figure 2-1
Air Sample Gross Beta Concentrations



2.2 THERMOLUMINESCENT DOSIMETRY

Note: Analytical results presented in Attachment II and summarized in Section 4.0.

2.2.1 Interpretations and Trends of Results

Even though gamma radiation dose in 1995 increased slightly when compared to previous years as illustrated in Table 2-1, this increase was noted at all monitored areas, including the control location. Therefore, this indicates that the ambient radiation levels continue to remain at or near background and have been uninfluenced by the operation of GGNS.

Figure 2-2, which further represents this conclusion, shows 1995 quarterly average results compared to 1979-1984 preoperational data, and 1987 - 1995 annual average results for indicator locations compared to the Vicksburg control. This figure indicates that ambient radiation levels have remained at or near background levels.

As in previous years, GGNS personnel performed an independent verification of the accuracy of GGNS TLD results through the use of NRC TLDs. Figure 2-3 presents these results through the third quarter of 1995. The ESP collects consistent, valid data based on the similarity of TLD results.

2.2.2 Program Description

The ESP measures ambient radiation in the environment surrounding GGNS with 59 TLDs to provide a quantitative measurement of the area radiation levels. GGNS personnel placed these environmental TLDs at distances from 0 to 18 miles (Figures 1-2 and 1-3, and Table 1-3). They collected dosimeters quarterly.

The ESP used the following criteria in establishing TLD locations:

- ODCM Specification 6.12.1 requires 40 TLDs, 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 approximately in the 3- to 5-mile range with one TLD in each meteorological sector
  - Eight TLDs located in special interest areas such as population centers and residences or utilized as controls.
- Sixteen permanent TLD stations at the protected area boundary.
- The remaining 3 TLDs utilized as duplicates at varying locations.

TABLE 2-1

Average TLD Dose Rates *

Year	Inner Ring (Within 2-Mile Radius)	Outer Ring (Within 6-Mile Radius)	Special Interest Areas	Control (M-14)	On-Site (Protected Area Boundary)
1987	18.3	17.7	17.9	18.8	21.8
1988	17.8	16.7	17.3	17.5	22.8
1989	18.0	17.6	18.5	18.2	20.9
1990	17.2	17.0	17.6	17.5	20.7
1991	18.1	17.9	17.8	18.0	23.7
1992	17.6	17.9	17.3	17.4	28.4
1993	17.8	17.9	18.5	19.8	25.3
1994	17.3	16.6	17.6	19.1	28.8
1995	19.8	19.1	19.3	20.8	29.0

* Units in millirem/quarter

Figure 2-2
TLD Radiation Dose

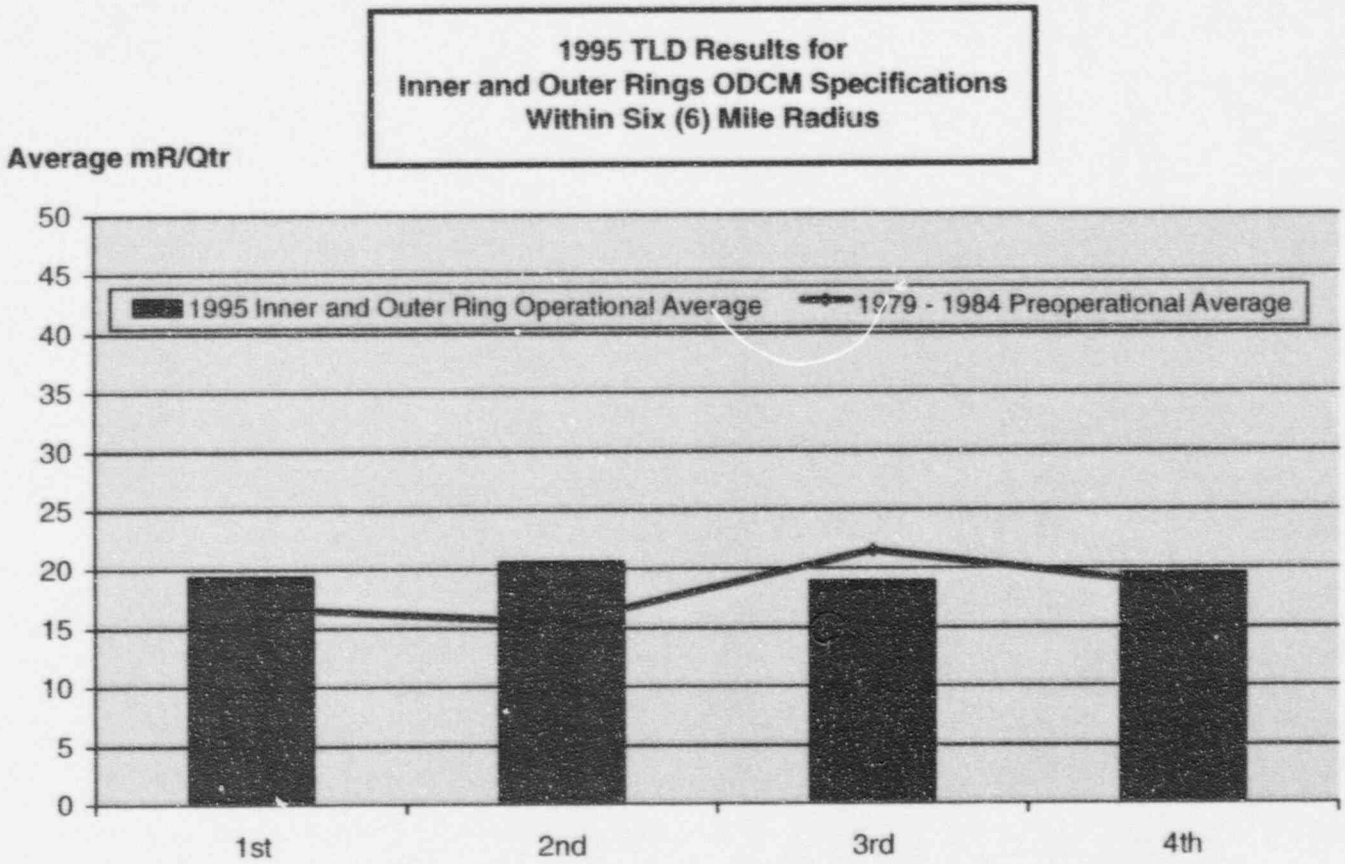


Figure 2-2
TLD Radiation Dose

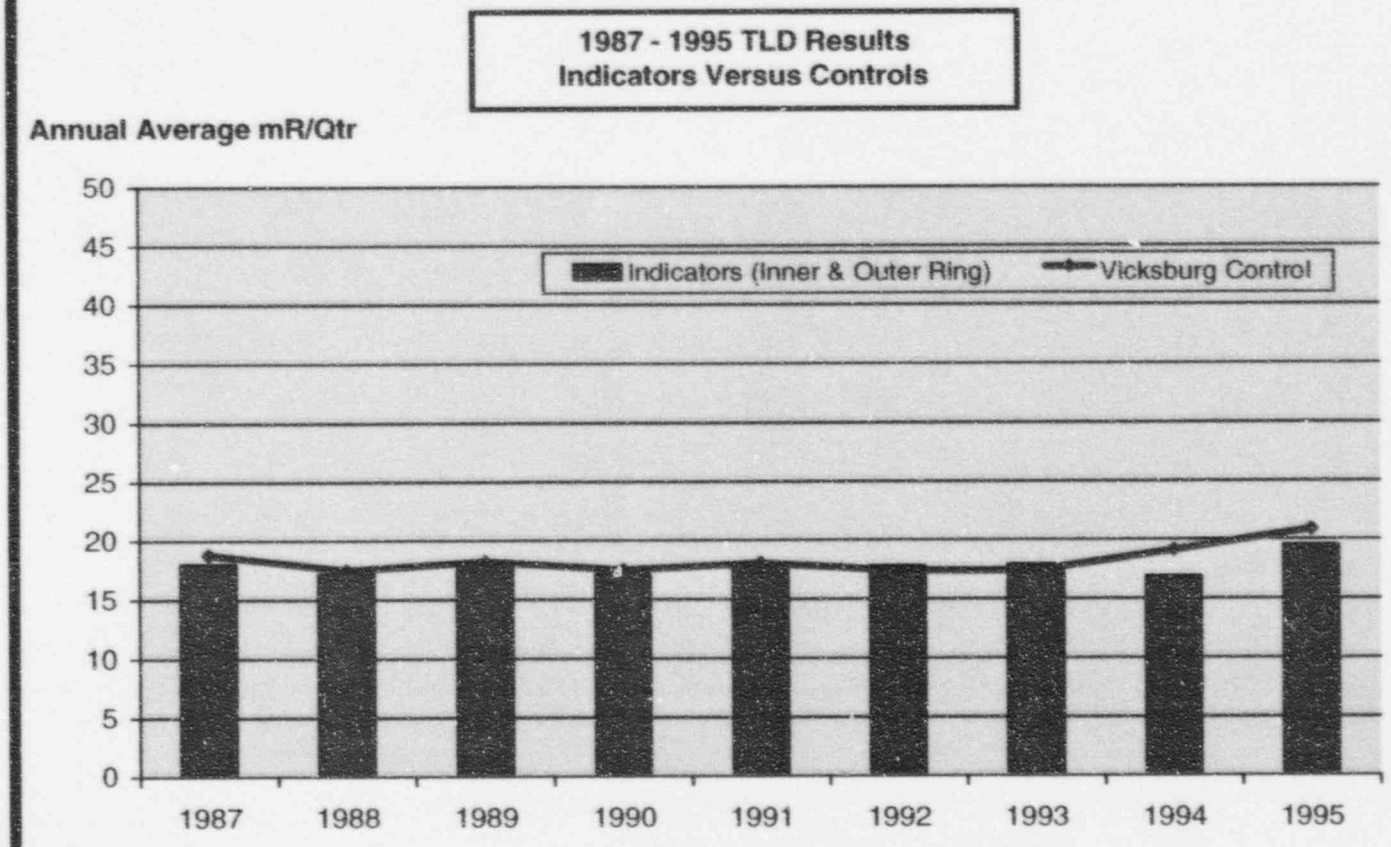
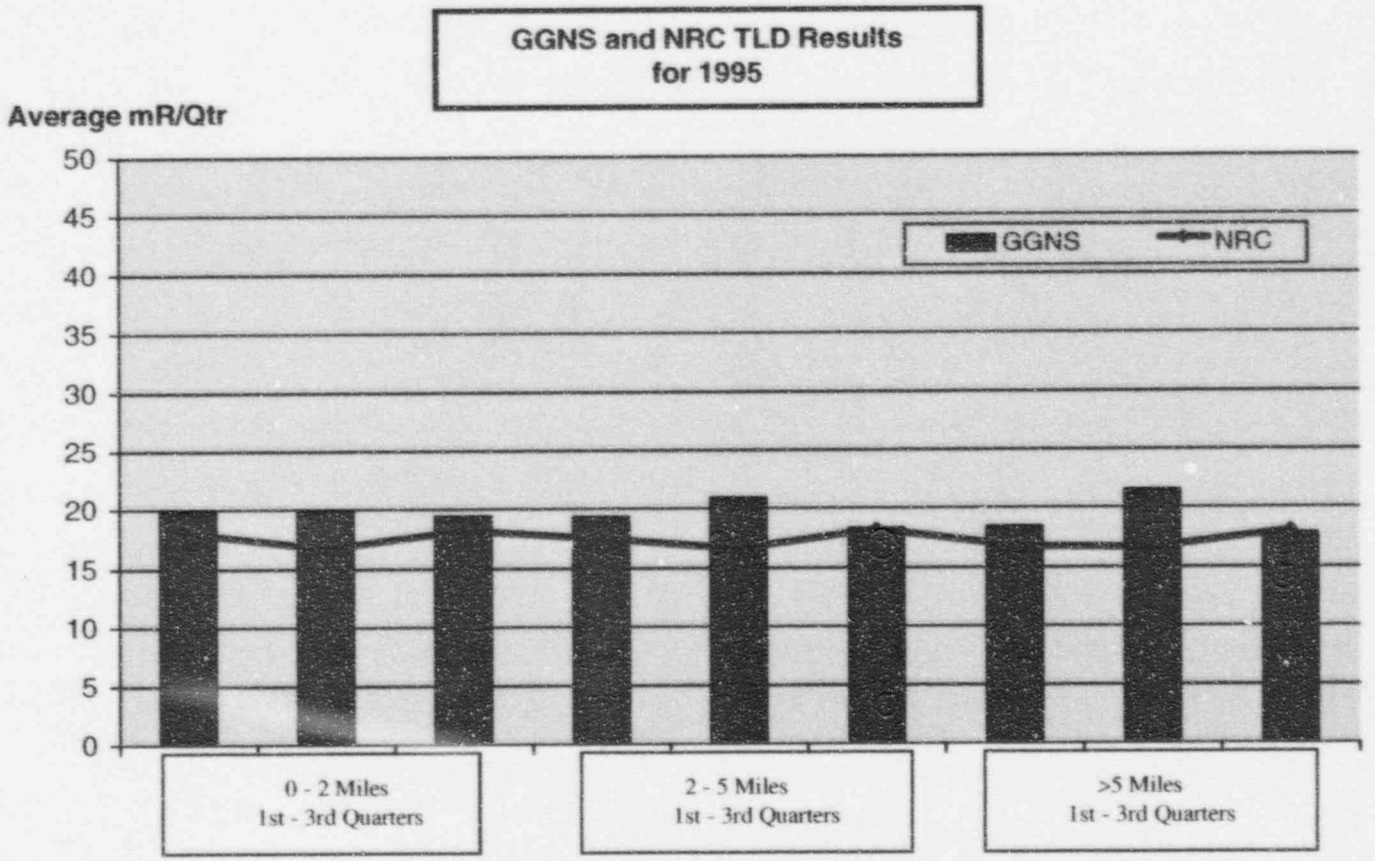


Figure 2-3
GGNS and NRC TLDs



2.3 MILK

Note: Analytical results presented in Table 6.1 of Attachment I and summarized in Section 4.0.

2.3.1 Interpretations and Trends of Results

GGNS personnel did not collect milk samples within five miles of the GGNS site in 1995 due to the absence of milking animals. However, they did collect milk samples from the Alcorn State University control location and had them analyzed for Iodine-131 and gamma radionuclides. As in preoperational and previous operational years, GGNS has not detected any radionuclides attributable to plant operations.

The ingestion pathway shown in ODCM Specification Table 6.12.1-1 specifies the frequency and location for obtaining milk samples. In addition, Table 6.12.1-1 provides for the use of a food product pathway as an alternative in instances of unavailable milk sampling locations. The ESP utilized this alternative in 1995.

2.3.2 Program Description

ODCM Specifications require sample collection from milking animals in three locations within a five km distance having the highest dose potential. If unavailable, ODCM Specifications require one sample from milking animals in each of three areas, between five to eight km, where calculated doses exceed 1.0 millirem per year. ODCM Specifications also require one control sample at a distance of 15-30 km.

GGNS personnel collect a control milk sample semiannually from the Alcorn State University Dairy (Figure 1-3 and Table 1-4) to establish background data. However, the ESP did not include milk animals in 1995 within eight km (five miles) of GGNS due to unavailability. Therefore, Section 2.5, Vegetation, addresses the unavailability of milk samples within the vicinity of GGNS.

2.4 WATER

Note: Analytical results presented in Tables 2.1 through 4.6 of Attachment I and summarized in Section 4.0.

2.4.1 Interpretations and Trends of Results

Cistern Water

GGNS personnel collected cistern water samples and had them analyzed for gross beta radionuclides, Iodine-131, tritium and gamma radionuclides. Iodine-131, tritium and gamma radionuclides during 1995, and as in preoperational and previous operational years, remained at or near background levels. Gross beta concentrations for indicator locations ranged from 1.5 - 22.1 pCi/l with a mean of 5.9 pCi/l as compared to the control which ranged from 1.5 - 4.1 pCi/l with a mean of 2.7 pCi/l. In addition, the 1995 gross beta indicator was similar to the average preoperational mean of 4.4 pCi/l. The elevated level of 22.1 pCi/l at the indicator location may have been attributable to sampling conditions and the presence of naturally occurring radionuclides or radionuclides from past atmospheric weapons testing that had become concentrated in the bottom of the holding tank over a period of time. Since water from this tank had leaked out due to damage incurred during inclement weather, GGNS personnel had to collect the sample from the holding tank floor, which was high in solids. GGNS noted that results from this location returned to levels indicative of past sampling after the water level in the tank increased. Overall, concentrations continue to remain at background levels.

Surface Water

GGNS personnel collected surface water samples and had them analyzed for tritium and gamma radionuclides. Gamma radionuclides remained undetectable in the downstream Mississippi River location which is consistent with preoperational and previous operational years. GGNS detected Cobalt-60 once in the upstream Mississippi River control location at a concentration of 2.0 pCi/l. Since this location is a control and the value is 87% below the required lower limits of detection (LLD) value of 15.0 pCi/l, there exists some

uncertainty on whether it is a true positive. Overall, gamma radionuclides at the upstream and downstream locations continue to remain at background levels.

Manganese-54 was detected once in the discharge basin location at a concentration of 3.0 pCi/l. Since this value is 80% below the required LLD value of 15.0 pCi/l, there exists some uncertainty on whether it is a true positive. In addition, Cobalt-60 was detected at concentrations which ranged from 3.0 - 14.0 pCi/l with a mean of 6.7 pCi/l. Since Cobalt-60 has consistently been detected during 1995, GGNS personnel have monitored this activity to note trends. Currently, all detected values have been below the required LLD value of 15.0 pCi/l.

Although GGNS detected tritium once in the downstream Mississippi River location at a concentration of 240.0 pCi/l, tritium activity at the upstream and downstream Mississippi River locations continue to be similar to background levels. Tritium levels for discharge basin surface water ranged from 5470.0 - 11430.0 pCi/l with a mean of 8815.0 pCi/l. Tritium levels continue to be elevated due to increased levels in the reactor coolant and radioactive effluents caused by stress corrosion cracking of control blade absorber tubes. This has resulted in a pathway for the release of boron. Subsequently, tritium production results from the neutron activation. Reduction in the tritium levels can be expected as control blades are gradually replaced and the number of blades above 20% depletion is reduced. No, regulatory limits for radioactive effluents have been exceeded. Figure 2-4 presents tritium results from 1985 through 1995 for this area.

Groundwater

GGNS personnel collected groundwater samples quarterly and had them analyzed for gamma radionuclides and tritium. As in preoperational and previous operational years, concentrations remained at background levels.

2.4.2 Program Description

ODCM Specifications require water sample collection in the vicinity of GGNS for the measurement of radioactivity by the waterborne exposure pathway.

GGNS personnel sampled **cistern water** monthly at two locations, an indicator near the site (McGee) and a control (Willis) (Figures 1-2 and 1-3, and Table 1-4). In addition, GGNS personnel sampled an alternate indicator location (Grand Gulf Road) in May 1995 while the McGee cistern was undergoing repair due to hail damage incurred during inclement weather. They collected samples in labeled containers and had them analyzed for gross beta radionuclides, Iodine-131, gamma radionuclides and a quarterly composite tritium.

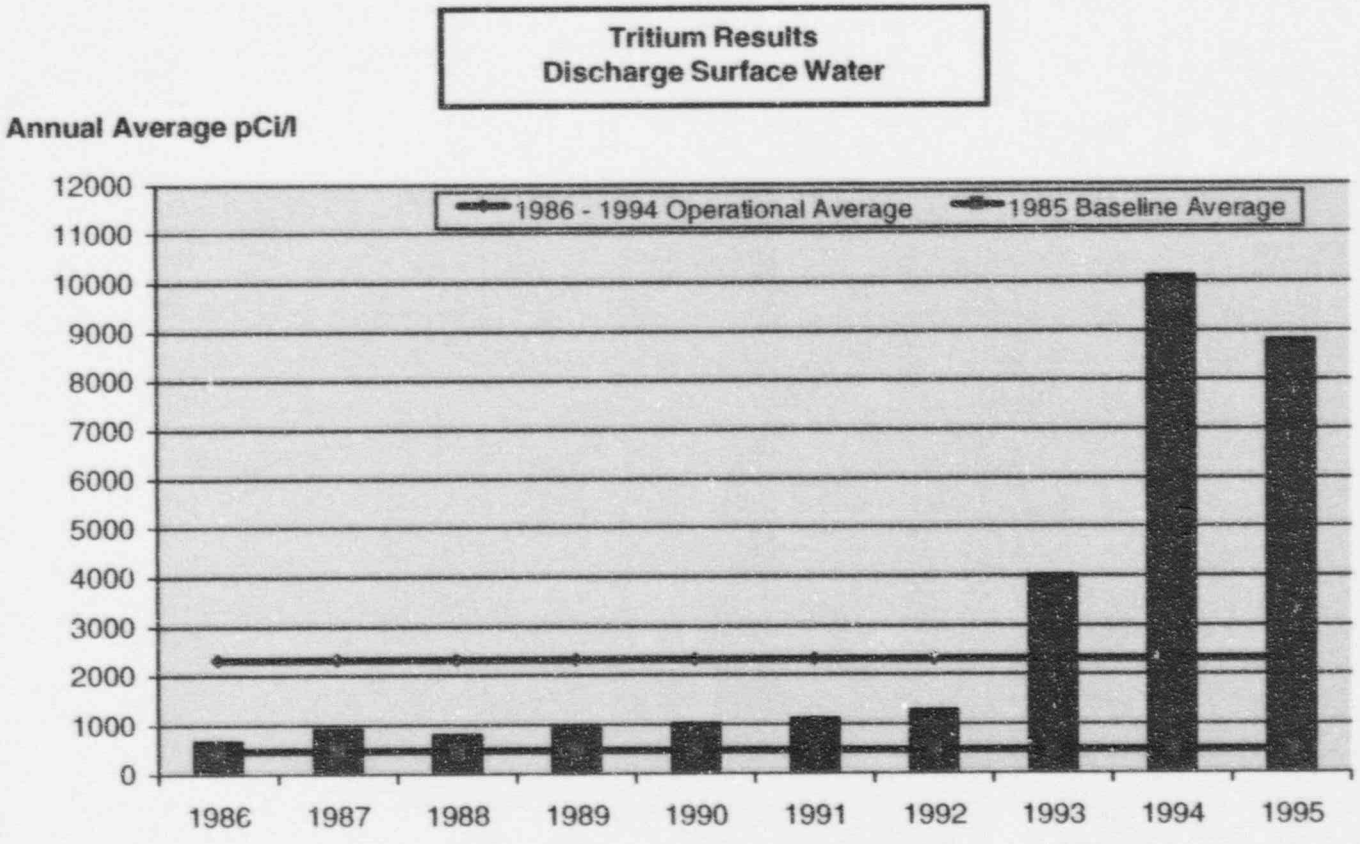
GGNS personnel sampled **surface water** from the Mississippi River monthly at points upstream (control) and downstream (indicator) of the plant discharge (Figure 1-2 and Table 1-4). They collected samples in labeled containers and had them analyzed for gamma radionuclides and a quarterly composite tritium.

GGNS personnel took an additional surface water sample from the **GGNS Discharge Basin**. They composited this sample monthly with an automatic sampler that collected a preset volume at hourly intervals. They

collected the sample in a labeled container and had it analyzed for gamma radionuclides and a quarterly composite tritium.

GGNS personnel sampled **groundwater** quarterly from two locations (Figure 1-2 and Table 1-4), Arnold Acres (indicator location) and Port Gibson City (control location). They collected samples in labeled containers and had them analyzed for gamma radionuclides and tritium.

Figure 2-4
Discharge Basin Tritium Results



2.5 VEGETATION

Note: Analytical results presented in Tables 5.1 through 5.4 of Attachment I and summarized in Section 4.0.

2.5.1 Interpretations and Trends of Results

GGNS personnel collected vegetation samples and had them analyzed for gamma radionuclides and Iodine-131. As in preoperational and previous operational years, GGNS detected no plant-related radionuclides during 1995.

2.5.2 Program Description

GGNS personnel collected broadleaf vegetation samples monthly for measurement of radioactivity by the ingestion exposure pathway, due to the unavailability of milk samples within five miles of GGNS. ODCM Specifications require samples of three different kinds of broadleaf vegetation grown nearest each of two different offsite locations with highest anticipated annual average groundlevel D/Q.

GGNS personnel met vegetation sampling requirements by maintaining two gardens inside the SITE BOUNDARY, Sectors J and R. Due to updating the atmospheric deposition rates , GGNS personnel relocated the Sector R garden to Sector H during 1995. These sampling locations (Figure 1-2 and Table 1-5) provided a more conservative assessment of doses due to the higher deposition rates (D/Qs) than would be measured at offsite sampling locations.

ODCM Specifications also require control samples of each of the similar types of onsite vegetation 15-30 km from the site. To fulfill this requirement, the ESP established a control vegetation sample location in Sector K at Alcorn State University (Figure 1-3 and Table 1-5).

The ESP prefers green-leafy vegetables suitable for human consumption as the primary source of broadleaf vegetation. At times, GGNS personnel took samples of any vegetation with relatively broad leaves on which airborne radioactive particulate material might be deposited, due to unavailability of green-leafy vegetables suitable for human consumption. They had the raw samples analyzed for gamma radionuclides and Iodine-131.

2.6 SEDIMENT

Note: Analytical results presented in Table 8.1 of Attachment I and summarized in Section 4.0.

2.6.1 Interpretations and Trends of Results

GGNS personnel collected sediment samples and had them analyzed for gamma radionuclides. The upstream Mississippi River location contained Cesium-137 during the preoperational years at a concentration of 200.0 pCi/kg and in previous operational years at an averaged concentration of 77.7 pCi/kg. In 1995, GGNS personnel also detected Cesium-137 once at a concentration of 8.0 pCi/kg. GGNS attributes the Cesium-137 detected during preoperational and operational years to past fallout from atmospheric weapons testing since this location is classified as a control and would not be affected by plant operations.

In 1995, the downstream Mississippi River location (Hamilton Lake) contained Cesium-137 at concentrations which ranged from 52.0 - 60.0 pCi/kg with a mean of 56.0 pCi/kg. This location also contained Cesium-137 during the preoperational and previous operational years at an average concentration of 2[illegible]g and 82.9 pCi/kg, respectively. GGNS attributes this activity to [illegible]ospheric weapons testing, since the probability of this location being affected by plant operations is remote due to the enormous dilution and sedimentation factors involved with the Mississippi River.

Table 2-2 provides an analytical results summary for 1987 through 1995 barge slip sediment samples. GGNS personnel attributes the presence of this radioactivity to buildup of very small amounts of particulates. This table shows a decrease in activity during 1995, and indicates that radionuclide concentrations in barge slip sediment are stabilizing. Although, previous sampling of the barge slip sediment revealed a wide range of activity, GGNS personnel have found no definite correlation between radionuclide concentrations and plant operating levels, effluent releases or river elevation.

2.6.2 Program Description

GGNS personnel collected sediment samples semiannually at the following locations (Figure 1-2 and Table 1-5):

- River shoreline in plant effluent discharge (Barge Slip)
- Downstream of the barge slip in the vicinity of the Hamilton Lake outfall (indicator location)
- Upstream from the GGNS discharge (Upper Grand Gulf Landing)

ODCM Specifications require only a sediment sample from the downstream location (indicator). However, the ESP utilized additional samples from an upstream location (control) and the barge slip (indicator).

GGNS personnel collected sediment samples near the shoreline from the top one-inch layer of sediment. They then discarded foreign objects and transferred the samples to clean, labeled containers for gamma radionuclide analyses.

TABLE 2-2

Barge Slip Sediment Analytical Summary *

Radionuclide	1987 Mean	1988 Mean	1989 Mean	1990 Mean	1991 Mean	1992 Mean	1993 Mean	1994 Mean	1995 Mean
Manganese-54	2205.0	480.0	734.0	258.0	1252.0	164.0	1202.0	396.0	148.5
Iron-59	ND**	ND**	ND**	ND**	ND**	ND**	53.0	ND**	ND**
Cobalt-58	103.0	82.0	56.0	39.0	59.0	ND**	143.0	ND**	42.0
Cobalt-60	799.0	628.0	736.0	424.0	1171.0	294.0	949.0	411.0	245.0
Chromium-51	1454.0	777.0	199.0	853.0	307.0	ND**	471.5	ND**	ND**
Cesium-134	87.0	109.0	104.0	ND**	ND**	ND**	ND**	ND**	ND**
Cesium-137	189.0	142.0	159.0	124.0	145.0	76.0	117.5	84.5	82.5

* Units in picocuries/kilogram

** None detected

2.7 FISH

Note: Analytical results presented in Tables 7.1 and 7.2 of Attachment I and summarized in Section 4.0.

2.7.1 Interpretations and Trends of Results

GGNS personnel collected fish samples semiannually from two locations and had them analyzed for gamma radionuclides. Analytical results for fish in 1995, and previous preoperational and operational years, have shown no data which was attributable to the operation of GGNS.

2.7.2 Program Description

GGNS personnel collected fish semiannually in the Mississippi River at the following locations (Figure 1-2 and Table 1-5):

- Downstream of the GGNS discharge point into the Mississippi River (indicator location)
- Upstream of the GGNS discharge point into the Mississippi River uninfluenced by plant operations (control location).

GGNS personnel collected fish by net, trotline, electroshock or purchased from commercial fishermen. They accompanied commercial fishermen, when purchasing samples, to ensure representative and valid samples from required locations.

GGNS personnel collected a sufficient amount from each location to provide a minimum of 1000 grams (wet weight) of eviscerated fish sample. They had the samples analyzed for gamma radionuclides.

2.8 SPECIAL SAMPLES

2.8.1 Interpretations and Trends of Results

In 1995, GGNS personnel collected six special samples and had them analyzed for gamma radionuclides and/or tritium. Discussion below provides descriptions of special samples collected and their results.

- Surface Water - One sample from Outfall 010 - Plant-related radionuclides not detected.
- Groundwater - One sample each from the North and South Construction Wells - Plant-related radionuclides not detected.
- Sediment - Two samples collected as follows:
  - One sample from Basin A - Cesium-137 detected at a concentration of 18.0 pCi/kg.
  - One sample from Basin B - Manganese-54 and Cesium-137 detected at a concentration of 7.0 and 8.0 pCi/kg, respectively.
- Venison - One sample from the GGNS property - Plant-related radionuclides not detected.

Results are summarized in Section 4.0.

2.8.2 Program Description

GGNS personnel collected special samples occasionally from nonroutine ESP locations to provide supplementary data and to address areas of special interests. Sample media may include sediment, water, milk, fish, meat and vegetation and may be analyzed for gamma radionuclides, Iodine-131, tritium or gross beta radionuclides, depending upon current interest.

2.9 ANNUAL LAND USE CENSUS

2.9.1 Interpretations and Trends of Results

GGNS did not modify the ESP as result of the census, even though some minor changes occurred from 1994 to 1995, as shown in Table 2-3. Also, the land use census identified no location which would yield a calculated dose or dose commitment greater than those currently being calculated.

The 1995 land use census results indicated land uses in the zero to 5-mile area surrounding GGNS have remained basically the same as those reported in previous land use census results. Table 2-4 presents the 1995 land use census data sheets.

2.9.2 Program Description

GGNS personnel conducted an annual land use census as required by ODCM Specification 6.12.2. This census identifies changes in uses of land in unrestricted areas surrounding GGNS which would require modifications to the ESP or ODCM. The land use census identified important criteria in each of the 16 meteorological sectors, such as nearest:

- Residence
- Animal milked for human consumption
- Garden of greater than 50 m^2 (500 ft^2) producing broadleaf vegetation.

GGNS personnel conducted the 1995 land use census by:

- Field surveys in each meteorological sector out to five miles in order to confirm:
  - Nearest permanent residence
  - Nearest unoccupied residence
  - Nearest garden and approximate size
  - Nearest milking animal.

- Identifying locations on map, measuring distances to GGNS and recording results on surveillance data sheets.
- Comparing 1995 census results to 1994 census results.
- Contacting the Claiborne County Agent for verification of nearest dairy animals.

TABLE 2-3

1994-1995 Land Use Census Changes

Sector	Parameter	1994 Data	1995 Data	Reason for Change
E	Nearest Occupied Residence	Johnnie Hadad 1.0 *	Hiram Wells 1.3 *	Relocated after storm event
H **	Nearest Broadleaf Garden	L. C. Jones 6.7 *	Nathan Nobles 6.0 *	New garden established
R	Nearest Broadleaf Garden	GGNS 1.6 *	None	Relocated garden to Sector H
P	Nearest Occupied Residence	Wallace Watson 7.7 *	None	Moved; house vacant
P	Nearest Broadleaf Garden	Wallace Watson 7.7 *	None	Moved; garden abandoned

*** Distances in kilometers.**

**** GGNS maintains a garden for vegetation sampling in this sector at 0.6 km.**

TABLE 2-4

1995 Land Use Census

Parameter		Sector A	Sector B	Sector C	Sector D
I. Nearest Occupied Residence	a. Distance (km) b. Name c. Address d. Number of occupants	1.5 Henry Gaines Rt 2 Box 391 Port Gibson,MS 1	1.2 Mary J. Dotson Rt 2 Box 391 Port Gibson,MS 4	1.1 Lanell Frazier P O. Box 33 Port Gibson,MS 3	4.3 Ethel M. Ryals Rt 2 Box 372B Port Gibson,MS 5
II. Nearest Unoccupied Residence	a. Distance (km)	None	None	None	None
III. Nearest Milk Animal	a. Distance b. Owner's Name	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (km) b. Owner's Name c. Address d. Garden size (m^2)	None	None	None	4.5 John L. Jackson Rt. 2 Box 371E Port Gibson,MS ≅ 200
V. Census Comparison	a. Is nearest occupied residence in same location as last census? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	Yes N/A N/A	Yes N/A N/A	Yes N/A N/A	Yes N/A Yes

TABLE 2-4

1995 Land Use Census

Parameter		Sector E	Sector F	Sector G	Sector H
I. Nearest Occupied Residence	a. Distance (km) b. Name c. Address d. Number of occupants	1.3* Hiram Wells Rt.2 Box 399A Port Gibson,MS 2	3.7 Jerrel Smith Rt.2 Box 216W Port Gibson,MS 1	3.4 David Buckner Rt.2 Box 416A Port Gibson,MS 4	1.8 David Dowell Rt.2 Box 414 Port Gibson,MS 5
II. Nearest Unoccupied Residence	a. Distance (km)	None	None	3.3 Hawthorne House	None
III. Nearest Milk Animal	a. Distance b. Owner's Name	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (km) b. Owner's Name c. Address d. Garden size (m^2)	1.3 Hiram Wells Rt.2 Box 399A Port Gibson,MS ≅ 100	None	None	6.0*(1) Nathan Nobles P.O. Box 811 Port Gibson,MS ≅ 380
V. Census Comparison	a. Is nearest occupied residence in same location as last census? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	No N/A Yes	Yes N/A N/A	Yes N/A N/A	Yes N/A No

* Denotes changes since 1994 Census

(1) GGNS maintains a garden in this sector for vegetation sampling at 0.6 km.

TABLE 2-4

1995 Land Use Census

Parameter		Sector J	Sector K	Sector L	Sector M
I. Nearest Occupied Residence	a. Distance (km) b. Name c. Address d. Number of occupants	5.0 Steve Price Rt.1 Box 412D Port Gibson,MS 2	3.5 Jim Cassell,Jr. Rt.2 Box 404 Port Gibson,MS 4	1.4 Buddy Roddey Rt.2 Box 401 Port Gibson,MS 4	None
II. Nearest Unoccupied Residence	a. Distance (km)	3.8 (Bill Cassell House)	None	None	None
III. Nearest Milk Animal	a. Distance b. Owner's Name	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (km) b. Owner's Name c. Address d. Garden size (m^2)	0.6 (1) GGNS P.O. Box 756 Port Gibson,MS ≅ 410	3.5 Jim Cassell,Jr. Rt.2 Box 404 Port Gibson,MS ≅ 400	1.4 Buddy Roddey Rt.2 Box 401 Port Gibson,MS ≅ 100	None
V. Census Comparison	a. Is nearest occupied residence in same location as last census? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	Yes N/A Yes	Yes N/A Yes	Yes N/A Yes	N/A N/A N/A

(1) GGNS maintains this garden for vegetation sampling. No other gardens were located in this sector.

TABLE 2-4

1995 Land Use Census

Parameter		Sector N	*Sector P*	*Sector Q*	Sector R
I. Nearest Occupied Residence	a. Distance (km) b. Name c. Address d. Number of occupants	None	*None**	*None*	1.7 C. Roddey Rt.2 Box 309 Port Gibson,MS 5
II. Nearest Unoccupied Residence	a. Distance (km)	2.6 (Bucksnort Camp)	6.9 *(Dr. Cobb Camp)*	5.6 *(Yucatan Camp)*	None
III. Nearest Milk Animal	a. Distance b. Owner's Name	None	*None*	*None*	None
IV. Nearest Broadleaf Garden	a. Distance (km) b. Owner's Name c. Address d. Garden size (m^2)	None	*None**	*None*	None*
V. Census Comparison	a. Is nearest occupied residence in same location as last census? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	N/A N/A N/A	*No* *N/A* *No*	*N/A* *N/A* *N/A*	Yes N/A No

*Denotes changes since 1994 Census

TABLE 2-4

1995 Land Use Census

VI. REMARKS: See attached, next page

Census conductd by: Craig Hulse
Signature / Date

VII. REVIEW:

a. Comparison of previous and present locations:

[ ] No differences

[X] Differences

[X] Significant

[ ] Insignificant

b. Calculations:

[X] Not required

[ ] Required

Reviewed/Approved by: Wlee 1-11-96
Signature / Date

TABLE 2-4

1995 Land Use Census

- Nearest residence in Sector E has changed from Johnny Hadad to Hiram Wells. The change in distance is ~0.3 km. Because the Well's residence is located farther away than the former Hadad residence, a calculated dose or dose commitment greater than the value currently calculated in accordance with the ODCM does not exist and new calculations are not necessary. The Well's residence has also been evaluated in previous Land Use Census data because it maintains the nearest broadleaf garden in Sector E.

- During 1995, a GGNS broadleaf garden, used to satisfy radiological sampling requirements, was relocated from Sector R to Sector H. This change was evaluated in GIN-95/00728. The L. C. Jones garden previously reported in Sector H, has been replaced by another garden 0.7 km closer to GGNS. The garden location currently used for dose calculations results in a higher dose commitment than either location in Sector H.

SECTION 3.0

ANALYTICAL PROGRAM TECHNICAL DESCRIPTION

3.1 Sample Handling and Treatment

The laboratory staff treats and stores samples upon receipt. Environmental samples frequently require treatment prior to analysis, depending on media and analyses type.

3.1.1 Water Samples

Generally, field personnel acidify one-gallon water samples with concentrated hydrochloric acid when collected, unless otherwise directed by the analytical laboratory. Tritium samples for analyses are not usually stored in polyethylene bottles for more than three or four months because water can evaporate through polyethylene.

3.1.2 Air Filters

The laboratory handled air filters with care during heavy dust loadings to avoid removing any particulate matter. They normally received air filters in plastic containers; the container as well as sample required analysis for some extremely low-level analyses.

3.1.3 Milk

The laboratory refrigerated milk samples until analyzed. They added a preservative (formaldehyde), if analyses delayed for more than a few days, to inhibit bacterial growth and retard spoilage. Unless frozen or shipped on ice, milk samples analyzed for Iodine-131 require addition of 100 ml of formaldehyde, of which field personnel normally add 40 ml prior to shipment, to avoid binding of the iodine that may occur with smaller levels of formaldehyde.

3.1.4 Soil and Bottom Sediment

The laboratory dried, pulverized and sieved soil and sediment samples before analysis. They then mixed the samples to ensure a homogeneous mixture.

3.1.5 Other Samples

The laboratory preserved perishable samples by refrigeration or freezing. Vegetation and other samples may require drying, pulverizing or ashing before or after analysis for long-term storage.

3.2 Gross Beta Air Sample Analysis

The laboratory counted air filters for 100 minutes, or until required LLDs shown in ODCM Specification Table 6.12.1-3 were achieved, in a low-background alpha-beta counter at least 24 hours after collection to allow for decay of short-lived materials such as radon and thoron.

3.3 Gross Beta Water Sample Analysis

This analysis measures overall beta radionuclides of water samples without identifying specific radioactive isotope present. This analysis involves evaporating a two hundred ml sample in a beaker and then drying beaker residue in a 2-inch stainless steel planchet at 100°C.

The laboratory counted the planchets for 100 minutes, or until required LLDs shown in GGNS ODCM Specification Table 6.12.1-3 were achieved, in a low-background alpha-beta counting system. Activity calculation includes a self-absorption correction factor for counter efficiency based on weight of residue on each planchet.

3.4 Tritium Water Sample Analysis

The laboratory added five ml of water to 15 ml of liquid scintillation solution in a 25 ml vial and then inserted the vial into a liquid scintillation spectrometer for a 300-500 minute count, or until required LLDs shown in GGNS ODCM Specification Table 6.12.1-3 were achieved.

3.5 Iodine-131 Sample Analysis

The laboratory mixed up four liters or more of the sample with a stable iodine carrier solution and passed the sample through an anion exchange resin column to remove iodine from the sample. The resin is then transferred to a 250 ml micro-Marinelli beaker and counted in a shielded intrinsic Germanium detector until the required LLDs shown in ODCM Specification Table 6.12.1-3 were achieved.

If the shielded intrinsic Germanium detectors are not available, they would then strip the iodine from the resin with a sodium hypochlorite solution, reduce with hydroxylamine hydrochloride and extract into carbon tetrachloride as free iodine. They then back-extract the free iodine into sodium bisulfite solution and precipitate as silver iodide. The laboratory mounted the precipitate on a stainless steel planchet and counted for 240 minutes, or until required LLDs shown in ODCM Specification Table 6.12.1-3 were achieved, in a low-background alpha-beta counting system.

3.6 Gamma Isotopic Sample Analysis

3.6.1 Milk and Water

The laboratory fills a 3.5-liter Marinelli beaker with a representative aliquot of the sample and counts for a minimum of 240 minutes, or until required LLDs shown in GGNS ODCM Specification Table 6.12.1-3 were achieved, in a shielded intrinsic Germanium detector coupled to a computer-based data acquisition system which performed a pulse height analysis.

A computer software program defines peaks by certain changes in slope of the spectrum. The program also compares energy of each peak with a library of peaks for radionuclide identification and then performs

calculation using appropriate fractional gamma ray abundance, half life, detector efficiency and net counts in the peak region.

3.6.2 Vegetation, Food and Garden Crops, and Fish

The laboratory loads a maximum quantity of undried vegetation, food or garden crop sample into a tared 3.5-liter Marinelli beaker and weighs. They then count the sample for 60 minutes, or until required LLDs shown in GGNS ODCM Specification Table 6.12.1-3 were achieved, in a shielded intrinsic Germanium detector as described in Section 3.6.1.

The laboratory loads as much as possible (up to the total sample) of the edible portion of a fish into a tared 1.0-liter or 3.5-liter Marinelli beaker, depending on fish quantity, and weighs. They diluted the sample with deionized water to weigh 3.5 kg and then counted for a minimum of 240 minutes in a shielded intrinsic Germanium detector as described in Section 3.6.1.

3.6.3 Soils and Sediments

The laboratory dries soils and sediments at a low temperature (less than 100°C), loads into a tared 1.0-liter Marinelli beaker and weighs. They then count the sample for 240 minutes, or until required LLDs shown in GGNS ODCM Specification Table 6.12.1-3 were achieved, in a shielded intrinsic Germanium detector as described in Section 3.6.1.

3.6.4 Charcoal Cartridges

The laboratory counts charcoal cartridges in a Marinelli beaker, with a maximum of six cartridges positioned on the side of a shielded intrinsic Germanium detector, for Iodine-131 screening purposes. They

calibrate each detector for both top and side positions and determine counting efficiency. They determine the Iodine-131 detection limit for each charcoal cartridge, assuming no positive results for Iodine-131, by utilizing smallest volume of air recorded for a cartridge within the Marinelli beaker.

The laboratory counts each charcoal separately, if Iodine-131 is observed in the screening count, by positioning on face of the detector.

3.6.5 Air Particulate

The laboratory stacks 12 to 14 (depending on calendar quarter) air particulate filters for a quarterly composite for each field station one on top of another. They then count the samples for at least one hour, or until required LLDs shown in GGNS ODCM Specification Table 6.12.1-3 were achieved, in a shielded intrinsic Germanium detector as described in Section 3.6.1.

3.7 Thermoluminescent Dosimetry

The GGNS ESP uses TLDs manufactured by Panasonic (Model UD-814). Although, these TLDs contain one lithium borate and three calcium sulfate phospor elements, only the calcium sulfate phospor element results are used for reporting purposes.

The laboratory anneals the TLDs prior to shipment. Upon arrival at GGNS, personnel sort and place designated TLDs in a plastic bag (two TLDs/bag) prior to placing in field. The laboratory reads the TLDs, upon return from the field, in a Panasonic Model UD-710 TLD reader.

3.8 Data Reporting Conventions

The laboratory calculated mean of analytical results as follows:

$$\overline{X} = Xi / n$$

where: $\overline{X}$ = Mean

Xi = Individual sample results

n = Number of sample results

They rounded calculated values by inspection of digits to the right of last reported digit, with values less than 5 rounded down and values greater than 5 rounded up. They rounded a reported value to an even number, when value equaled 5.

The laboratory reported analytical results less than the 2 sigma counting error as less than LLD calculated for that sample. They reported analytical results greater than the sigma counting error along with associated 2 sigma counting error as a plus or minus ($\pm$) term.

The laboratory considers calendar quarters as the following time periods:

1st Quarter = January - March

2nd Quarter = April - June

3rd Quarter = July - September

4th Quarter = October - December

SECTION 4.0

ENVIRONMENTAL SURVEILLANCE PROGRAM SUMMARY

4.1 1995 Program Results Summary

Table 4-1 summarizes required ODCM Specifications, supplemental and special ESP sample results for 1995. Table 4-2 lists indicator and control locations utilized to develop Table 4-1. GGNS personnel did not use values reported as less than (<) for determining indicator and control location ranges and means. With exception of the elevated tritium levels in the discharge basin surface water, 1995 results compare to that encountered in previous years.

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station Docket No. 50-416
Location of Facility Claiborne, Mississippi Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Air Particulate (pCi/m^3)	GB 310	0.01	0.016 (202 / 206) [0.004 - 0.058]	AS-7 UH (Sector H, 0.5 mi)	0.018 (41 / 41) [0.004 - 0.036]	0.018 (104 / 104) [0.006 - 0.039]	0
	GS 26						
	Cs-134	0.05	<LLD	N/A	N/A	<LLD	0
	Cs-137	0.06	<LLD	N/A	N/A	<LLD	0
Airborne Iodine (pCi/m^3)	I-131 310	0.07	<LLD	N/A	N/A	<LLD	0
Inner Ring TLDs (mR/Qtr)	Gamma 62	(f)	19.8 (61 / 62) [13.5 - 29.0]	M-16 (Sector A, 0.9 mi)	23.5 (3 / 3) [20.5 - 29.0]	N/A	0
Outer Ring TLDs (mR/Qtr)	Gamma 59	(f)	19.1 (59 / 59) [14.0 - 29.0]	M-40 (Sector M, 5.0 mi)	21.6 (4 / 4) [20.0 - 23.5]	N/A	0
Special Interest TLDs (mR/Qtr)	Gamma 26	(f)	19.3 (26 / 26) [17.0 - 22.5]	M-01 (Sector E, 3.5 mi)	21.3 (4 / 4) [20.0 - 22.5]	N/A	0
Control TLDs (mR/Qtr)	Gamma 4	(f)	N/A	N/A	N/A	20.8 (4 / 4) [20.0 - 21.5]	0
Protected Area TLDs (mR/Qtr)	Gamma 63	(f)	29.0 (63 / 63) [14.5 - 81.0]	M-69 (Sector G, Onsite)	60.8 (4 / 4) [28.0 - 81.0]	N/A	0

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station **Docket No.** 50-416
Location of Facility Claiborne, Mississippi **Reporting Period** January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Cistern Water (pCi/l)	GB 24	4	5.9 (7 / 12) [1.5 - 22.1]	Grand Gulf Road * (Sector E, 0.7 mi)	6.1 (1 / 1) [N/A]	2.7 (6 / 12) [1.5 - 4.1]	0
	I-131 24	1.0	<LLD	N/A	N/A	<LLD	0
	H-3 9	2000	<LLD	N/A	N/A	<LLD	0
	GS 24						
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	<LLD	N/A	N/A	<LLD	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	30	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	60	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0

*** Alternate location for McGee cistern during the month of May only.**

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station Docket No. 50-416
Location of Facility Claiborne, Mississippi Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Surface Water (pCi/l)	H-3 12	2000	7100.0 (5 / 8) [240.0 - 11430.0]	Discharge Basin (Sector P, 0.2 mi)	8815.0 (4 / 4) [5470.0 - 11430.0]	<LLD	4
	GS 36						
	Mn-54	15	3.0 (1 / 24) [N/A]	Discharge Basin (Sector P, 0.2 mi)	3.0 (1 / 12) [N/A]	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	6.7 (9 / 24) [3.0 - 14.0]	Discharge Basin (Sector P, 0.2 mi)	6.7 (9 / 12) [3.0 - 14.0]	2.0 (1 / 12) [N/A]	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	30	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	60	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station Docket No. 50-416
Location of Facility Claiborne, Mississippi Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Special Surface Water (pCi/l)	GS 1						
	Mn-54	15	<LLD	N/A	N/A	N/A	0
	Fe-59	30	<LLD	N/A	N/A	N/A	0
	Co-58	15	<LLD	N/A	N/A	N/A	0
	Co-60	15	<LLD	N/A	N/A	N/A	0
	Zn-65	30	<LLD	N/A	N/A	N/A	0
	Zr-95	30	<LLD	N/A	N/A	N/A	0
	Nb-95	15	<LLD	N/A	N/A	N/A	0
	Cs-134	15	<LLD	N/A	N/A	N/A	0
	Cs-137	18	<LLD	N/A	N/A	N/A	0
	Ba-140	60	<LLD	N/A	N/A	N/A	0
	La-140	15	<LLD	N/A	N/A	N/A	0

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station **Docket No.** 50-416
Location of Facility Claiborne, Mississippi **Reporting Period** January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Well Water (pCi/l)	H-3 8	2000	<LLD	N/A	N/A	<LLD	0
	GS 8						
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	<LLD	N/A	N/A	<LLD	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	30	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	60	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station Docket No. 50-416
Location of Facility Claiborne, Mississippi Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Special Well Water (pCi/l)	H-3 2	2000	<LLD	N/A	N/A	N/A	0
	GS 2						
	Mn-54	15	<LLD	N/A	N/A	N/A	0
	Fe-59	30	<LLD	N/A	N/A	N/A	0
	Co-58	15	<LLD	N/A	N/A	N/A	0
	Co-60	15	<LLD	N/A	N/A	N/A	0
	Zn-65	30	<LLD	N/A	N/A	N/A	0
	Zr-95	30	<LLD	N/A	N/A	N/A	0
	Nb-95	15	<LLD	N/A	N/A	N/A	0
	Cs-134	15	<LLD	N/A	N/A	N/A	0
	Cs-137	18	<LLD	N/A	N/A	N/A	0
	Ba-140	60	<LLD	N/A	N/A	N/A	0
	La-140	15	<LLD	N/A	N/A	N/A	0
Milk (pCi/l)	I-131 2	1.0	N/A	N/A	N/A	<LLD	0
	GS 2						
	Cs-134	15	N/A	N/A	N/A	<LLD	0
	Cs-137	18	N/A	N/A	N/A	<LLD	0
	Ba-140	60	N/A	N/A	N/A	<LLD	0
	La-140	15	N/A	N/A	N/A	<LLD	0

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station Docket No. 50-416
Location of Facility Claiborne, Mississippi Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Vegetation (pCi/kg wet)	I-131 108	60	<LLD	N/A	N/A	<LLD	0
	GS 108						
	Cs-134	60	<LLD	N/A	N/A	<LLD	0
	Cs-137	80	<LLD	N/A	N/A	<LLD	0
Fish (pCi/kg wet)	GS 4						
	Mn-54	130	<LLD	N/A	N/A	<LLD	0
	Fe-59	260	<LLD	N/A	N/A	<LLD	0
	Co-58	130	<LLD	N/A	N/A	<LLD	0
	Co-60	130	<LLD	N/A	N/A	<LLD	0
	Zn-65	260	<LLD	N/A	N/A	<LLD	0
	Cs-134	130	<LLD	N/A	N/A	<LLD	0
	Cs-137	150	<LLD	N/A	N/A	<LLD	0

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station Docket No. 50-416
Location of Facility Claiborne, Mississippi Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Bottom Sediment	GS 6						
(pCi/kg dry)	Mn-54	(f)	148.5 (2 / 4) [21.0 - 276.0]	Barge Slip (Sector Q, 1.5 mi)	148.5 (2 / 2) [21.0 - 276.0]	<LLD	2
	Fe-59	(f)	<LLD	N/A	N/A	<LLD	0
	Co-58	(f)	42.0 (1 / 4) [N/A]	Barge Slip (Sector Q, 1.5 mi)	42.0 (1 / 2) [N/A]	<LLD	0
	Co-60	(f)	245.0 (2 / 4) [17.0 - 473.0]	Barge Slip (Sector Q, 1.5 mi)	245.0 (2 / 2) [17.0 - 473.0]	<LLD	1
	Cr-51	(f)	<LLD	N/A	N/A	<LLD	0
	Cs-134	150	<LLD	N/A	N/A	<LLD	0
	Cs-137	180	69.3 (4 / 4) [39.0 - 126.0]	Barge Slip (Sector Q, 1.5 mi)	82.5 (2 / 2) [39.0 - 126.0]	8.0 (1 / 2) [N/A]	1

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station **Docket No.** 50-416
Location of Facility Claiborne, Mississippi **Reporting Period** January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Special Bottom Sediment (pCi/kg dry)	GS 2						
	Mn-54	(f)	7.0 (1 / 2) [N/A]	Basin B (Sector M, 0.3 mi)	7.0 (1 / 1) [N/A]	N/A	0
	Fe-59	(f)	<LLD	N/A	N/A	N/A	0
	Co-58	(f)	<LLD	N/A	N/A	N/A	0
	Co-60	(f)	<LLD	N/A	N/A	N/A	0
	Cr-51	(f)	<LLD	N/A	N/A	N/A	0
	Cs-134	150	<LLD	N/A	N/A	N/A	0
	Cs-137	180	13.0 (2 / 2) [8.0 - 18.0]	Basin A (Sector R, 0.3 mi)	18.0 (1 / 1) [N/A]	N/A	0
Special Venison (pCi/kg wet)	GS 1						
	Mn-54	130	<LLD	N/A	N/A	N/A	0
	Fe-59	260	<LLD	N/A	N/A	N/A	0
	Co-58	130	<LLD	N/A	N/A	N/A	0
	Co-60	130	<LLD	N/A	N/A	N/A	0
	Zn-65	260	<LLD	N/A	N/A	N/A	0
	Cs-134	130	<LLD	N/A	N/A	N/A	0
	Cs-137	150	<LLD	N/A	N/A	N/A	0

TABLE 4-1

Environmental Monitoring Program Summary

Name of Facility Grand Gulf Nuclear Station Docket No. 50-416
Location of Facility Claiborne, Mississippi Reporting Period January - December 1995
(County, State)

a GB = Gross beta; I-131 = Iodine-131; H-3 = Tritium; GS = Gamma scan.
b LLD = Required lower limit of detection based on Grand Gulf Nuclear Station ODCM Specification Table 6.12.1-3.
c Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (F).
d Locations are specified (1) by name and (2) sector relative to reactor site.
e Non-routine results are those which exceed ten times the control station value. If no control station value is available, the result is considered non-routine if it exceeds ten times the preoperational value for the location.
f LLD not defined in GGNS ODCM Specification Table 6.12.1-3.

TABLE 4-2

Indicator & Control Locations

Sample Type	Locations	Total Samples	Total & Type Analyses
Air	• **Indicators** - AS-4 GJOE *	12	12 ea. - Gross Beta, I-131; 1-Gamma
	AS-5 TC	52	52 ea. - Gross Beta, I-131; 4-Gamma
	AS-6 RS *	12	12 ea. - Gross Beta, I-131; 1-Gamma
	AS-6 BF	41	41 ea. - Gross Beta, I-131; 3-Gamma
	AS-7 MT *	12	12 ea. - Gross Beta, I-131; 1-Gamma
	AS-7 UH	41	41 ea. - Gross Beta, I-131; 3-Gamma
	AS-8 WR *	12	12 ea. - Gross Beta, I-131; 1-Gamma
	AS-10 HR *	12	12 ea. - Gross Beta, I-131; 1-Gamma
	AS-11 BB *	12	12 ea. - Gross Beta, I-131; 1-Gamma
	• **Controls** - AS-1 PG	52	52 ea. - Gross Beta, I-131; 4-Gamma
	AS-3 61VA	52	52 ea. - Gross Beta, I-131; 4-Gamma
TLDs	• **Indicators**		
	- Inner Ring M-16, 17, 19, 20, 21, 22, 23, 25, 27, 28, 41, 85, 86, 92, 93, 94	62	62-Gamma
	- Outer Ring M-36, 40, 47, 48, 49,50, 51, 55,56, 57, 58, 59, 88, 89, 90, 91	59	59-Gamma
	- Special Interest Areas M-01, 07, 09, 10, 33, 38, 39	26	26-Gamma
	• **Control** - M-14	4	4-Gamma
	• **Indicators**		
	- Protected Area * M-61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74, 76, 77, 81	63	63-Gamma

*** Not required by ODCM Specifications**

TABLE 4-2

Indicator & Control Locations

Sample Type	Locations	Total Samples	Total & Type Analyses
Water	**Cistern**		
	• **Indicators** - McGee	11	11 ea. - Gross Beta, I-131, Gamma; 4-Tritium
	Grand Gulf Road *	1	1 ea. - Gross Beta, I-131, Gamma; 1-Tritium
	• **Control** - Willis	12	12 ea. - Gross Beta, I-131, Gamma; 4-Tritium
	Surface		
	• **Indicators** - Downstream Ms. River	12	4-Tritium; 12-Gamma
	Discharge Basin	12	4-Tritium; 12-Gamma
	Outfall 010 *	1	1-Gamma
	• **Control** - Upstream Ms. River	12	4-Tritium; 12-Gamma
	Groundwater		
	• **Indicators** - Arnold Acres	4	4 ea. - Tritium, Gamma
	N. Construction Well *	1	1 ea. - Tritium, Gamma
	S. Construction Well *	1	1 ea. - Tritium, Gamma
	• **Control** - Port Gibson City	4	4 ea. - Tritium, Gamma
Milk	• **Indicator** - None	N/A	N/A
	• **Control** - Alcorn State University	2	2 ea. - I-131, Gamma
Vegetation	• **Indicators** - Sector H Garden	18	18 ea. - I-131, Gamma
	Sector J Garden	36	36 ea. - I-131, Gamma
	Sector R Garden	18	18 ea. - I-131, Gamma
	• **Control** - Sector K (Alcorn State University)	36	36 ea. - I-131, Gamma
Fish	• **Indicator** - Downstream Ms. River	2	2-Gamma
	• **Control** - Upstream Ms. River	2	2-Gamma

*** Not required by ODCM Specifications**

TABLE 4-2

Indicator & Control Locations

Sample Type	Locations	Total Samples	Total & Type Analyses
Sediment	• **Indicators** - Hamilton Lake (SEDHAM)	2	2-Gamma
	Barge Slip (SEDBAR) *	2	2-Gamma
	Basin A *	1	1-Gamma
	Basin B *	1	1-Gamma
	• **Control** - Upstream Ms. River (SEDCONT) *	2	2-Gamma
Venison	• **Indicator** - GGNS Property *	1	1-Gamma
	• **Control** - None	N/A	N/A

* Not required by ODCM Specifications

SECTION 5.0

QUALITY CONTROL DATA

5.1 Crosscheck Program Results

ESI System Chemistry analyzed EPA crosscheck samples for GGNS. Attachment I contains these results. ESI System Chemistry's analysis participation, shown in Figure 5-1, indicates that the laboratory achieved an 82% (18 of 22) acceptance on intercomparison sample analyses.

The laboratory determined that the four unacceptable analysis results, which involved Cobalt-60, Zinc-65, Cesium-137 and Barium-133 gamma radionuclides, was associated with a dilution error that occurred during sample preparation. Their conclusion was based on results being 14 - 33% higher than those reported by EPA and no appreciable differences in the detector efficiency curves during re-verification. This dilution error did not affect the validity of GGNS' 1995 gamma spectroscopy data. The EPA crosscheck table shown in Attachment I provides additional explanation.

GGNS personnel also included, as part of Figure 5-1, a corrected graph of ESI's intercomparison results that was reported in the 1994 AREOR. Although the percentage of acceptable analyses did not change, acceptable analyses should have been 19 instead of 18.

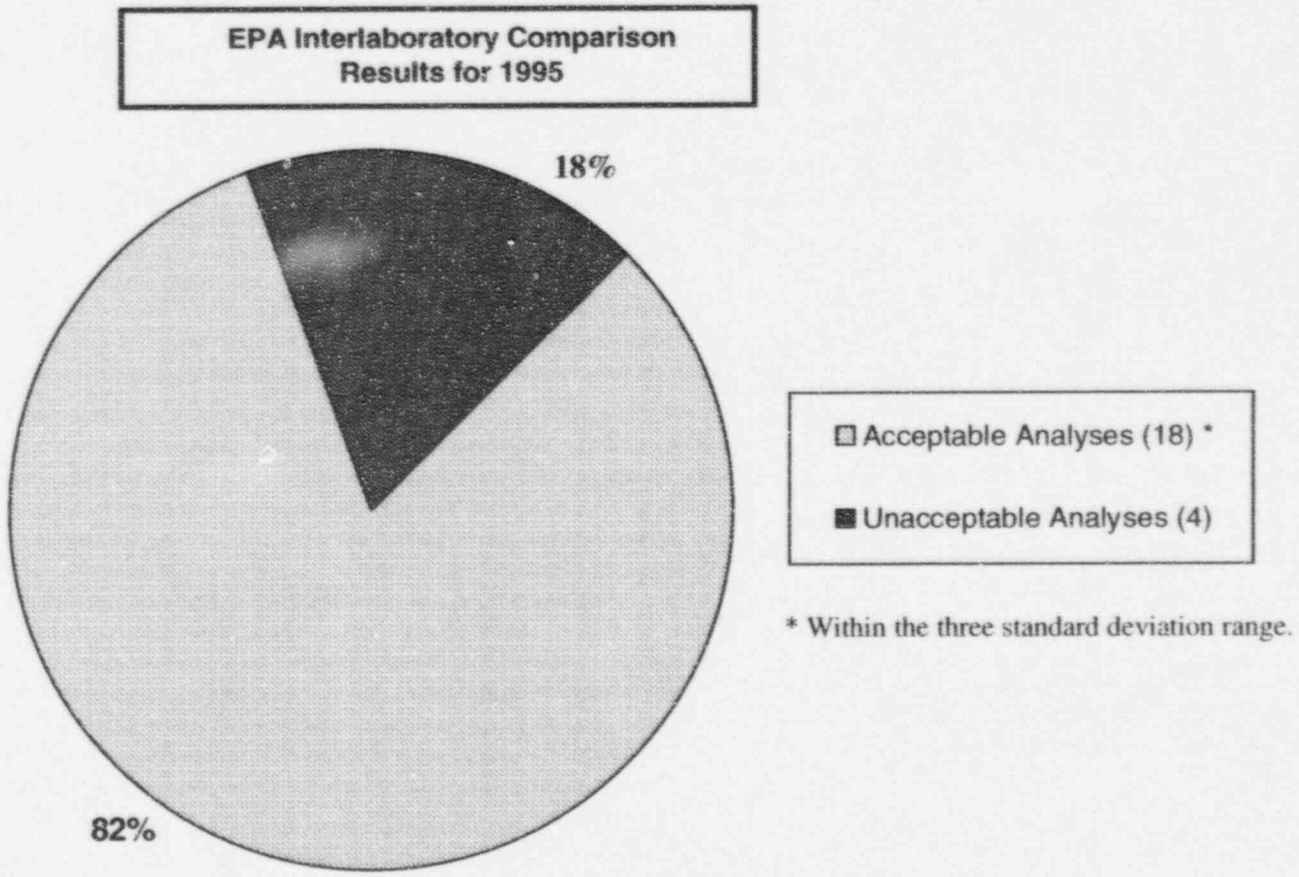
5.2 Duplicate Samples

Attachment I contains duplicate samples, identified by suffix "GG" accompanying the laboratory number, submitted by GGNS to ESI System Chemistry for analysis. Attachment II contains duplicate TLDs submitted to the Waterford3 Dosimetry Section. Summary below identifies sample media duplicated.

Sample Media	Samples Duplicated	Table No.
Cistern Water	6	2.1 - 2.6
Groundwater	2	3.1 & 3.2
Surface Water	11	4.1 - 4.6
Vegetation	12	5.1 - 5.4
Milk	1	6.1
Fish	2	7.1 & 7.2
Sediment	3	8.1
TLDs	11	4 (Attachment II)

GGNS personnel's review of duplicate sample results indicates that ESI and Waterford3 provide consistent and valid data based on similarity of results.

Figure 5-1
EPA Intercomparison Study

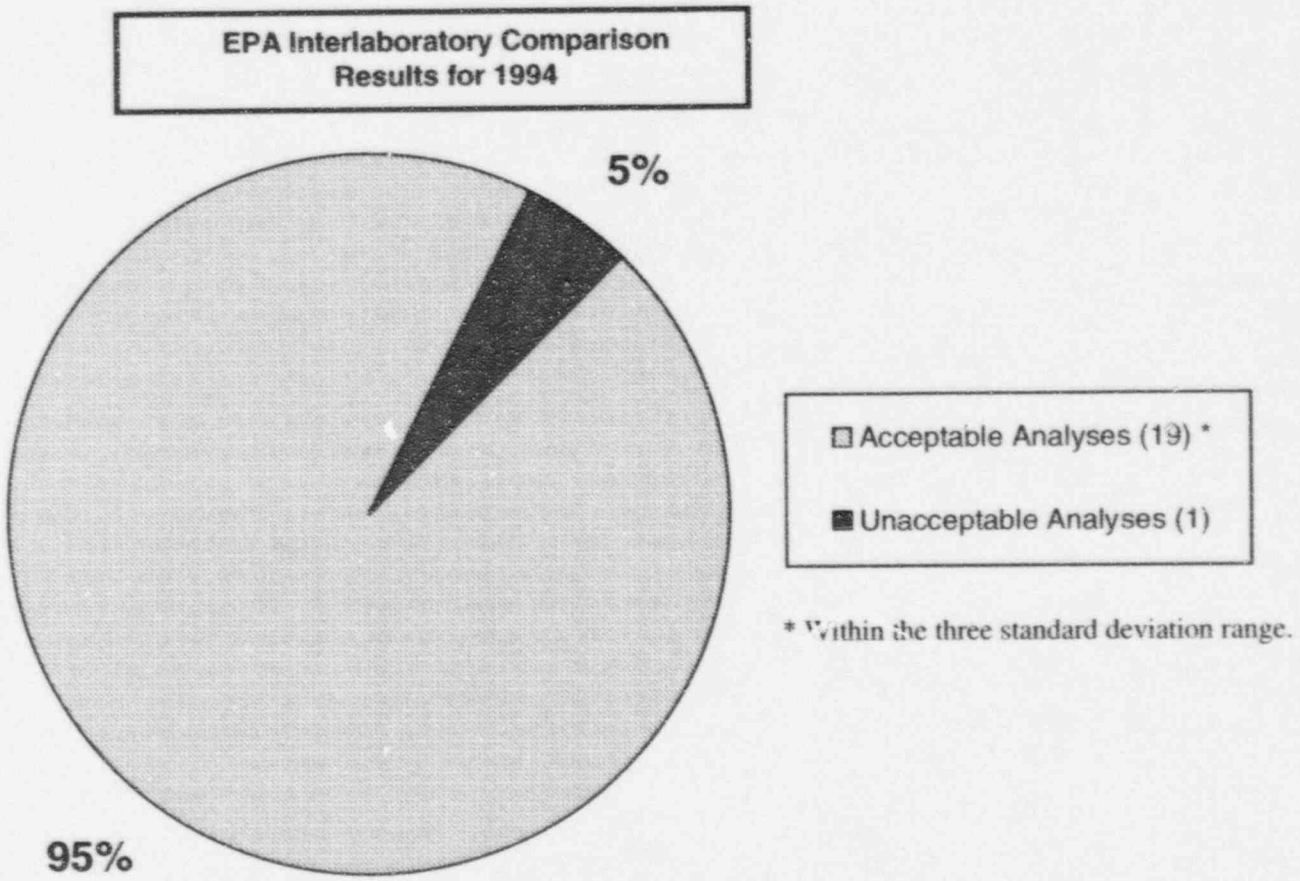


* Within the three standard deviation range.

Figure 5-1

EPA Intercomparison Study

(Corrected 1994 AREOR Graph)



* Within the three standard deviation range.

SECTION 6.0

1995 SAMPLING AND ANALYTICAL RESULTS

6.1 1995 Data

Attachments I and II present data obtained by ESI System Chemistry and Waterford3 Dosimetry Section on samples collected from January through December 1995. ESI System Chemistry provides data in monthly progress reports. Waterford-3 Dosimetry Section provides TLD data in quarterly reports. With exception of elevated tritium levels in the discharge basin surface water, data presented in Attachments I and II compare to that encountered in preoperational and previous operational years.

6.2 Lower Limit of Detection

ESI System Chemistry routinely counts lower than the maximum LLD required by ODCM Specification Table 6.12.1-3. Factors such as unavoidable small sample size, background fluctuations, presence of interfering radionuclides or other uncontrollable circumstances cause ODCM Specifications' LLDs to be unachievable in some instances. However, GGNS personnel's review of 1995 results indicates acceptable LLDs within required ODCM Specification limits.

6.3 Reporting Levels

GGNS' review indicates that no samples equaled or exceeded reporting levels for radioactivity concentration in environmental samples, as outlined in ODCM Specifications Table 6.12.1-2 when averaged over any calendar quarter, due to GGNS effluents. Therefore, 1995 results did not trigger any Radiological Monitoring Program Special Reports.

6.4 Sampling Deviations

The required ODCM Specification LLD value of 0.01 pCi/m3 was not achieved at air sampling station AS-5 TC during the sampling periods of December 28, 1994 - January 3, 1996, January 17, 1996 - January 24, 1996 and March 14 - 21, 1996, due to low sample volume caused by equipment

malfunctions. To prevent this incident from recurring, GGNS personnel increased visual observations for this sampler location to ensure that an operable unit was maintained at all times.

GGNS personnel did not collect a May 1995 cistern water sample at the McGee location due to a holding tank leak that developed as a result of hail damage. However to meet ODCM Specification requirements, they did sample an alternate location near the site. In addition, GGNS repaired the McGee cistern and sampling resumed at this location in June 1995.

The ESP lost nine TLDs required by ODCM Specifications during 1995, due to vandalism or flooding from the Mississippi River. Other TLD programs experience losses of this type. In 1995, GGNS personnel calculated a 94% (151 of 160) recovery rate for required ODCM Specification TLDs, which compares with other TLD programs. In addition, as a result of water damage, GGNS personnel noted that results from seven TLDs required by ODCM Specifications were not representative of historical readings or previous quarters. Water damage normally occurs during seasonal flood waters and/or humid conditions. Water damage is a typical problem incurred by other TLD programs located in similar geographical regions and climatic conditions.

The ESP did not include milk sampling within five miles (8 km) of GGNS in 1995 due to unavailability. Therefore, GGNS personnel continue to sample the Alcorn State University Control location semiannually until such time that milk samples become available within five miles (8 km) of GGNS. They collected vegetation samples to monitor the ingestion pathway, as specified in ODCM Specifications Table 6.12.1-1, because of milk unavailability.

GGNS personnel conducted all other ESP activities required by ODCM Specification without exception.

6.5 Radioactivity Not Attributable To GGNS

The GGNS ESP detected radioactivity attributable to other sources twice. These include the 25th Chinese nuclear test explosion in 1980, and the radioactive plume release due to reactor core degradation at Chernobyl Nuclear Power Plant in 1986.

6.6 Sampling Relocation

Although vegetation and milk sampling locations did not change in 1995 due to unavailability, GGNS did make modifications to the ESP as a result of updating the atmospheric deposition rates and evaluation of historical data from supplemental locations. These changes involved the following:

- Relocated air sampling stations AS-6 RS (Sector C, Radius 0.5 miles) and AS-7 MT (Sector A, Radius 0.9 miles) to AS-6 BF (Sector K, Radius 0.4 miles) and AS-7 UH (Sector H, Radius 0 5 miles), respectively.
- Relocated Sector R garden to Sector H.
- Discontinued supplemental air sampling stations AS-4 GJOE, AS-8 WR, AS-10 HR and AS-11 BB.

Since milk and vegetation samples continued to be available as required by the ODCM Specifications, GGNS personnel did not identify any new locations or report circumstances of unavailability in the Annual Radioactive Effluent Release Report.

6.7 Comparison To Federal and State Programs

GGNS personnel compared GGNS data to federal and state monitoring programs as results became available. The programs used for comparison include the U.S. Nuclear Regulatory Commission (NRC) TLD Direct Radiation

Monitoring Network and the Mississippi State Department of Health (MSDH), Division of Radiological Health.

The latest available NRC TLD Network results compare to those from the GGNS ESP. In addition, as shown in Section 2.2 of this report, GGNS and NRC TLDs produced similar results on the average.

The MSDH and the GGNS ESP entail similar radiological environmental monitoring program requirements. These programs include collocated air samples and splitting or sharing sample media such as vegetation, water, sediment, meat, fish and milk. Both programs have obtained similar results over previous years. In 1995, and as in previous years, the MSDH and GGNS detected radioactivity attributable to plant effluent in the barge slip.

6.8 Unavailable Results

GGNS received analytical contractor results in adequate time for inclusion in this report. In addition, GGNS' review identified no missing results.

6.9 Harmful Effects or Irreversible Damage

The ESP monitoring did not detect any harmful effects or evidence of irreversible damage in 1995. Therefore, GGNS personnel addressed no problems.

Attachment I

1995 Environmental Sampling and Analytical Report

GRAND GULF
RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT
DECEMBER 1995

PREPARED BY:

SYSTEM CHEMISTRY SECTION
ENTERGY SERVICES, INC.

GRAND GULF
RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE OF CONTENTS

Summary of Monitoring Results

Duplicate Samples

The term "GG" ending of a lab number denotes a duplicate sample.

Radionuclides Detected

Manganese-54, Cobalt-60 and Tritium were detected in the discharge basin surface water during this reporting period.

Manganese-54, Cobalt-58, Cobalt-60 and Cesium-137 were detected in the barge slip sediment during this reporting period.

Cesium-137 was detected in the Hamilton Lake outfall sediment during this reporting period.

Radiological Environmental Monitoring Program Modifications

Air sample locations AS-4 (GJOE), AS-6 (RS), AS-7 (MT), AS-8 (WR), AS-10 (HR) and AS-11 (BB) were discontinued after March 21, 1995.

The broadleaf vegetation garden located in Sector R at 1.2 kilometers was discontinued in June 1995 and replaced by a garden in Sector H at 0.64 kilometers.

Air sample locations AS-6 (BF) and AS-7 (UH) were added on March 14, 1995.

Sampling Deviations

The required lower limit of detection value of 0.01 pCi/m^3 was not achieved for the following air sample locations:

Location	Sample Period	Run Time (Hrs)	Comment
AS-5 (TC) *	12/28/94 - 01/03/95	16.25	Pump failure resulted in low sample volume
	01/17/95 - 01/24/95	30.8	Pump failure resulted in low sample volume
	03/14/95 - 03/21/95	5.92	Breaker tripped

* Required by ODCM Specifications.

Cistern water was not collected for the month of May at the McGee location due to a leak that developed in the holding tank from hail damage. The leak was repaired upon discovery and a sample was collected from it in June. To meet ODCM Specification requirements, an alternate location near the site was sampled for the month of May. The following air sample locations had short run times or no flow at collection due to equipment malfunctions or weather related incidences:

Location	Sample Period	Run Time (Hrs)	Comment
AS-3 (61VA) *	05/02/95 - 05/09/95	166.5	Inclement weather
	06/20/95 - 06/27/95	-----	No flow at collection
	11/21/95 - 11/28/95	165.67	Blown fuse
AS-5 (TC) *	02/28/95 - 03/07/95	163.53	Blown fuse
	03/07/95 - 03/14/95	134.22	Breaker tripped
	03/21/95 - 03/28/95	121.92	Breaker tripped
	04/18/95 - 04/25/95	53.8	Breaker tripped
	05/02/95 - 05/09/95	25.21	Breaker tripped
	05/16/95 - 05/23/95	75.14	Inclement weather
	05/23/95 - 05/31/95	-----	No flow at collection
	09/26/95 - 10/03/95	61.75	Mechanical failure
	10/17/95 - 10/24/95	112.38	Mechanical failure
AS-7 (MT) *	03/07/95 - 03/14/95	164.5	Mechanical failure
AS-10 (HR)	02/28/95 - 03/07/95	-----	No flow at collection
	03/07/95 - 03/14/95	163.92	Mechanical failure
AS-6 (BF) *	05/02/95 - 05/09/95	161.3	Inclement weather
	05/16/95 - 05/23/95	74.09	Inclement weather
	05/23/95 - 05/31/95	-----	No flow at collection
	07/05/95 - 07/11/95	90.45	Blown fuse
	07/18/95 - 07/25/95	110.31	Breaker tripped
	07/25/95 - 08/01/95	107.2	Breaker tripped
	08/08/95 - 08/15/95	127.32	Breaker tripped
	08/15/95 - 08/22/95	130.2	Breaker tripped
	08/22/95 - 08/29/95	149.10	Breaker tripped
	09/06/95 - 09/12/95	95.38	Breaker tripped
	09/19/95 - 09/26/95	154.42	Breaker tripped
	10/24/95 - 10/31/95	71.92	Mechanical failure
	11/07/95 - 11/14/95	113.75	Breaker tripped
	11/21/95 - 11/28/95	136.42	Breaker tripped
AS-7 (UH) *	05/02/95 - 05/09/95	161.3	Inclement weather
	05/16/95 - 05/23/95	55.3	Inclement weather
	05/23/95 - 05/31/95	-----	No flow at collection

* Required by ODCM Specifications.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.1
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-1, PG

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500002	12/28/94	01/03/95	0.025 +/-0.003	< 0.020
9500413	01/03/95	01/10/95	0.019 +/-0.002	< 0.018
9500914	01/10/95	01/17/95	0.014 +/-0.002	< 0.015
9501259	01/17/95	01/24/95	0.006 +/-0.002	< 0.014
9501675	01/24/95	01/31/95	0.013 +/-0.002	< 0.013
9502183	01/31/95	02/07/95	0.014 +/-0.002	< 0.011
9502863	02/07/95	02/14/95	0.015 +/-0.002	< 0.014
9503285	02/14/95	02/21/95	0.015 +/-0.002	< 0.011
9503658	02/21/95	02/28/95	0.012 +/-0.002	< 0.016
9504198	02/28/95	03/07/95	0.013 +/-0.002	< 0.027
9504506	03/07/95	03/14/95	0.015 +/-0.002	< 0.017
9505210	03/14/95	03/21/95	0.008 +/-0.002	< 0.015
9505626	03/21/95	03/28/95	0.014 +/-0.002	< 0.019
9506103	03/28/95	04/04/95	0.012 +/-0.002	< 0.017
9506785	04/04/95	04/11/95	0.011 +/-0.002	< 0.021
9507421	04/11/95	04/18/95	0.014 +/-0.002	< 0.019
9507983	04/18/95	04/25/95	0.012 +/-0.002	< 0.049
9508512	04/25/95	05/02/95	0.021 +/-0.002	< 0.017
9509207	05/02/95	05/09/95	0.015 +/-0.002	< 0.046
9509550	05/09/95	05/16/95	0.013 +/-0.002	< 0.012
9510168	05/16/95	05/23/95	0.013 +/-0.002	< 0.042
9510597	05/23/95	05/31/95	0.016 +/-0.002	< 0.025
9511049	05/31/95	06/06/95	0.016 +/-0.002	< 0.023
9511814	06/06/95	06/13/95	0.012 +/-0.002	< 0.016
9512537	06/13/95	06/20/95	0.020 +/-0.002	< 0.018
9513049	06/20/95	06/27/95	0.022 +/-0.002	< 0.011

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.1a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-1, PG

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9513686	06/27/95	07/05/95	0.018 +/-0.002	< 0.022
9514075	07/05/95	07/11/95	0.022 +/-0.003	< 0.024
9514627	07/11/95	07/18/95	0.024 +/-0.002	< 0.013
9515379	07/18/95	07/25/95	0.015 +/-0.002	< 0.027
9515917	07/25/95	08/01/95	0.013 +/-0.002	< 0.019
9516669	08/01/95	08/08/95	0.016 +/-0.002	< 0.010
9517356	08/08/95	08/15/95	0.021 +/-0.002	< 0.029
9518081	08/15/95	08/22/95	0.025 +/-0.002	< 0.026
9518662	08/22/95	08/29/95	0.021 +/-0.002	< 0.018
9519444	08/29/95	09/06/95	0.030 +/-0.002	< 0.015
9519919	09/06/95	09/12/95	0.039 +/-0.003	< 0.035
9520481	09/12/95	09/19/95	0.020 +/-0.002	< 0.019
9520920	09/19/95	09/26/95	0.024 +/-0.002	< 0.012
9521404	09/26/95	10/03/95	0.024 +/-0.002	< 0.049
9522101	10/03/95	10/10/95	0.019 +/-0.002	< 0.020
9522637	10/10/95	10/17/95	0.025 +/-0.002	< 0.027
9522986	10/17/95	10/24/95	0.023 +/-0.002	< 0.017
9523456	10/24/95	10/31/95	0.026 +/-0.002	< 0.037
9523726	10/31/95	11/07/95	0.019 +/-0.002	< 0.016
9524385	11/07/95	11/14/95	0.016 +/-0.002	< 0.036
9525020	11/14/95	11/21/95	0.030 +/-0.002	< 0.021
9525384	11/21/95	11/28/95	0.022 +/-0.003	< 0.022
9525530	11/28/95	12/05/95	0.026 +/-0.003	< 0.016
9525835	12/05/95	12/12/95	0.037 +/-0.003	< 0.015
9526498	12/12/95	12/19/95	0.013 +/-0.002	< 0.017
9526843	12/19/95	12/27/95	0.022 +/-0.002	< 0.012

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO : 1.2
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-3, 61VA

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500003	12/28/94	01/03/95	0.026 +/-0.003	< 0.020
9500414	01/03/95	01/10/95	0.020 +/-0.002	< 0.018
9500915	01/10/95	01/17/95	0.015 +/-0.002	< 0.015
9501260	01/17/95	01/24/95	0.011 +/-0.002	< 0.014
9501676	01/24/95	01/31/95	0.012 +/-0.002	< 0.013
9502184	01/31/95	02/07/95	0.018 +/-0.002	< 0.011
9502864	02/07/95	02/14/95	0.015 +/-0.002	< 0.014
9503286	02/14/95	02/21/95	0.014 +/-0.002	< 0.011
9503659	02/21/95	02/28/95	0.009 +/-0.002	< 0.016
9504199	02/28/95	03/07/95	0.018 +/-0.002	< 0.027
9504507	03/07/95	03/14/95	0.017 +/-0.002	< 0.017
9505211	03/14/95	03/21/95	0.009 +/-0.002	< 0.015
9505627	03/21/95	03/28/95	0.018 +/-0.002	< 0.019
9506104	03/28/95	04/04/95	0.016 +/-0.002	< 0.017
9506786	04/04/95	04/11/95	0.013 +/-0.002	< 0.021
9507422	04/11/95	04/18/95	0.016 +/-0.002	< 0.019
9507984	04/18/95	04/25/95	0.010 +/-0.002	< 0.049
9508513	04/25/95	05/02/95	0.021 +/-0.002	< 0.017
9509208	05/02/95	05/09/95 *	0.012 +/-0.002	< 0.046
9509551	05/09/95	05/16/95	0.014 +/-0.002	< 0.012
9510169	05/16/95	05/23/95	0.015 +/-0.002	< 0.042
9510598	05/23/95	05/31/95	0.017 +/-0.002	< 0.025
9511050	05/31/95	06/06/95	0.011 +/-0.002	< 0.023
9511815	06/06/95	06/13/95	0.019 +/-0.003	< 0.016
9512538	06/13/95	06/20/95	0.018 +/-0.002	< 0.018
9513050	06/20/95	06/27/95 *	0.013 +/-0.002	< 0.011

* See Summary of Monitoring Results, Page 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.2a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-3, 61VA

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9513687	06/27/95	07/05/95	0.014 +/-0.002	< 0.022
9514076	07/05/95	07/11/95	0.016 +/-0.002	< 0.024
9514628	07/11/95	07/18/95	0.017 +/-0.002	< 0.013
9515380	07/18/95	07/25/95	0.015 +/-0.002	< 0.027
9515918	07/25/95	08/01/95	0.012 +/-0.002	< 0.019
9516670	08/01/95	08/08/95	0.010 +/-0.002	< 0.010
9517357	08/08/95	08/15/95	0.015 +/-0.002	< 0.029
9518082	08/15/95	08/22/95	0.019 +/-0.002	< 0.026
9518663	08/22/95	08/29/95	0.023 +/-0.002	< 0.018
9519445	08/29/95	09/06/95	0.023 +/-0.002	< 0.015
9519920	09/06/95	09/12/95	0.028 +/-0.003	< 0.035
9520482	09/12/95	09/19/95	0.027 +/-0.002	< 0.019
9520921	09/19/95	09/26/95	0.021 +/-0.002	< 0.012
9521405	09/26/95	10/03/95	0.020 +/-0.002	< 0.049
9522102	10/03/95	10/10/95	0.015 +/-0.002	< 0.020
9522638	10/10/95	10/17/95	0.023 +/-0.002	< 0.027
9522987	10/17/95	10/24/95	0.017 +/-0.002	< 0.017
9523457	10/24/95	10/31/95	0.020 +/-0.002	< 0.037
9523727	10/31/95	11/07/95	0.014 +/-0.002	< 0.016
9524386	11/07/95	11/14/95	0.013 +/-0.002	< 0.036
9525021	11/14/95	11/21/95	0.025 +/-0.002	< 0.021
9525385	11/21/95	11/28/95 *	0.015 +/-0.003	< 0.022
9525531	11/28/95	12/05/95	0.018 +/-0.002	< 0.016
9525836	12/05/95	12/12/95	0.032 +/-0.003	< 0.015
9526499	12/12/95	12/19/95	0.012 +/-0.002	< 0.017
9526844	12/19/95	12/27/95	0.023 +/-0.002	< 0.012

* See Summary of Monitoring Results, Page 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. 1.3
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-4, GJOE *

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500004	12/28/94	01/03/95	0.022 +/-0.003	< 0.020
9500415	01/03/95	01/10/95	0.018 +/-0.002	< 0.018
9500916	01/10/95	01/17/95	0.012 +/-0.002	< 0.015
9501261	01/17/95	01/24/95	0.010 +/-0.002	< 0.014
9501677	01/24/95	01/31/95	0.010 +/-0.002	< 0.013
9502185	01/31/95	02/07/95	0.014 +/-0.002	< 0.011
9502865	02/07/95	02/14/95	0.012 +/-0.002	< 0.014
9503287	02/14/95	02/21/95	0.013 +/-0.002	< 0.011
9503660	02/21/95	02/28/95	0.010 +/-0.002	< 0.016
9504200	02/28/95	03/07/95	0.015 +/-0.002	< 0.027
9504508	03/07/95	03/14/95	0.013 +/-0.002	< 0.017
9505212	03/14/95	03/21/95	0.008 +/-0.002	< 0.015

* See Summary of Monitoring Results, Page 1.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1 4
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-5, TC

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500005	12/28/94	01/03/95 *	< 0.027	< 0.020
9500416	01/03/95	01/10/95	0.023 +/-0.004	< 0.018
9500917	01/10/95	01/17/95	0.014 +/-0.002	< 0.015
9501262	01/17/95	01/24/95 *	< 0.017	< 0.014
9501675	01/24/95	01/31/95	0.010 +/-0.002	< 0.013
9502186	01/31/95	02/07/95	0.014 +/-0.002	< 0.011
9502866	02/07/95	02/14/95	0.013 +/-0.002	< 0.014
9503288	02/14/95	02/21/95	0.012 +/-0.002	< 0.011
9503661	02/21/95	02/28/95	0.010 +/-0.002	< 0.016
9504201	02/28/95	03/07/95 *	0.012 +/-0.002	< 0.027
9504509	03/07/95	03/14/95 *	0.020 +/-0.003	< 0.017
9505213	03/14/95	03/21/95 *	< 0.080	< 0.015
9505628	03/21/95	03/28/95 *	0.018 +/-0.003	< 0.019
9506105	03/28/95	04/04/95	0.016 +/-0.002	< 0.017
9506787	04/04/95	04/11/95	0.012 +/-0.002	< 0.021
9507423	04/11/95	04/18/95	0.011 +/-0.002	< 0.019
9507985	04/18/95	04/25/95 *	< 0.010	< 0.049
9508514	04/25/95	05/02/95	0.015 +/-0.002	< 0.017
9509209	05/02/95	05/09/95 *	0.011 +/-0.011	< 0.046
9509552	05/09/95	05/16/95	0.012 +/-0.002	< 0.012
9510179	05/16/95	05/23/95 *	0.014 +/-0.004	< 0.042
9510599	05/23/95	05/31/95 *	0.016 +/-0.002	< 0.025
9511051	05/31/95	06/06/95	0.012 +/-0.002	< 0.023
9511816	06/06/95	06/13/95	0.012 +/-0.002	< 0.016
9512539	06/13/95	06/20/95	0.017 +/-0.002	< 0.018
9513051	06/20/95	06/27/95	0.019 +/-0.002	< 0.011

* See Summary of Monitoring Results, Pages 1 and 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.4a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-5, TC

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9513688	06/27/95	07/05/95	0.013 +/-0.002	< 0.022
9514077	07/05/95	07/11/95	0.017 +/-0.002	< 0.024
9514629	07/11/95	07/18/95	0.017 +/-0.002	< 0.013
9515381	07/18/95	07/25/95	0.014 +/-0.002	< 0.027
9515919	07/25/95	08/01/95	0.011 +/-0.002	< 0.019
9516671	08/01/95	08/08/95	0.010 +/-0.002	< 0.010
9517358	08/08/95	08/15/95	0.016 +/-0.002	< 0.029
9518083	08/15/95	08/22/95	0.018 +/-0.002	< 0.026
9518664	08/22/95	08/29/95	0.024 +/-0.002	< 0.018
9519446	08/29/95	09/06/95	0.026 +/-0.002	< 0.015
9519921	09/06/95	09/12/95	0.032 +/-0.003	< 0.035
9520483	09/12/95	09/19/95	0.021 +/-0.002	< 0.019
9520922	09/19/95	09/26/95	0.022 +/-0.002	< 0.012
9521406	09/26/95	10/03/95 *	0.028 +/-0.005	< 0.049
9522103	10/03/95	10/10/95	0.013 +/-0.002	< 0.020
9522639	10/10/95	10/17/95	0.021 +/-0.002	< 0.027
9522988	10/17/95	10/24/95 *	0.017 +/-0.003	< 0.017
9523458	10/24/95	10/31/95	0.017 +/-0.002	< 0.037
9523728	10/31/95	11/07/95	0.014 +/-0.002	< 0.016
9524387	11/07/95	11/14/95	0.013 +/-0.002	< 0.036
9525022	11/14/95	11/21/95	0.026 +/-0.002	< 0.021
9525386	11/21/95	11/28/95	0.018 +/-0.003	< 0.022
9525532	11/28/95	12/05/95	0.020 +/-0.002	< 0.016
9525837	12/05/95	12/12/95	0.033 +/-0.003	< 0.015
9526500	12/12/95	12/19/95	0.012 +/-0.002	< 0.017
9526845	12/19/95	12/27/95	0.026 +/-0.002	< 0.012

* See Summary of Monitoring Results, Page 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.5
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-6, RS *

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500006	12/28/94	01/03/95	0.028 +/-0.003	< 0.020
9500417	01/03/95	01/10/95	0.013 +/-0.002	< 0.018
9500918	01/10/95	01/17/95	0.014 +/-0.002	< 0.015
9501263	01/17/95	01/24/95	0.010 +/-0.002	< 0.014
9501679	01/24/95	01/31/95	0.011 +/-0.002	< 0.013
9502187	01/31/95	02/07/95	0.015 +/-0.002	< 0.011
9502867	02/07/95	02/14/95	0.015 +/-0.002	< 0.014
9503289	02/14/95	02/21/95	0.015 +/-0.002	< 0.011
9503662	02/21/95	02/28/95	0.010 +/-0.002	< 0.016
9504202	02/28/95	03/07/95	0.017 +/-0.002	< 0.027
9504510	03/07/95	03/14/95	0.017 +/-0.002	< 0.017
9505214	03/14/95	03/21/95	0.008 +/-0.002	< 0.015

* See Summary of Monitoring Results, Page 1.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. 1 6
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-7, MT *

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0 01	0 07
9500907	12/28/94	01/03/95	0 027 +/-0 003	< 0 020
9500418	01/03/95	01/10/95	0 023 +/-0 002	< 0 018
9500919	01/10/95	01/17/95	0 013 +/-0 002	< 0 015
9501264	01/17/95	01/24/95	0 013 +/-0 002	< 0 014
9501680	01/24/95	01/31/95	0 012 +/-0 002	< 0 013
9502188	01/31/95	02/07/95	0 017 +/-0 002	< 0 011
9502868	02/07/95	02/14/95	0 013 +/-0 002	< 0 014
9503290	02/14/95	02/21/95	0 014 +/-0 002	< 0 011
9503663	02/21/95	02/28/95	0 010 +/-0 002	< 0 016
9504203	02/28/95	03/07/95	0 016 +/-0 002	< 0 027
9504511	03/07/95	03/14/95 *	0 015 +/-0 002	< 0 017
9505215	03/14/95	03/21/95	0 008 +/-0 002	< 0 015

* See Summary of Monitoring Results, Pages 1 and 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.7
SAMPLE: AIR SAMPLES, (GEA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-8, WR *

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500008	12/28/94	01/03/95	0.024 +/-0.003	< 0.020
9500419	01/03/95	01/10/95	0.018 +/-0.002	< 0.019
9500920	01/10/95	01/17/95	0.006 +/-0.002	< 0.015
9501265	01/17/95	01/24/95	0.007 +/-0.002	< 0.014
9501681	01/24/95	01/31/95	0.009 +/-0.002	< 0.013
9502189	01/31/95	02/07/95	0.012 +/-0.002	< 0.011
9502869	02/07/95	02/14/95	0.013 +/-0.002	< 0.014
9503291	02/14/95	02/21/95	0.012 +/-0.002	< 0.011
9503664	02/21/95	02/28/95	0.007 +/-0.002	< 0.016
9504204	02/28/95	03/07/95	0.011 +/-0.002	< 0.027
9504512	03/07/95	03/14/95	0.013 +/-0.002	< 0.017
9505216	03/14/95	03/21/95	0.009 +/-0.002	< 0.015

* See Summary of Monitoring Results, Page 1.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO.: 1.8
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-10, HR *

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500009	12/28/94	01/03/95	0.026 +/-0.003	< 0.020
9500420	01/03/95	01/10/95	0.010 +/-0.002	< 0.018
9500921	01/10/95	01/17/95	0.014 +/-0.002	< 0.015
9501266	01/17/95	01/24/95	0.009 +/-0.002	< 0.014
9501682	01/24/95	01/31/95	0.013 +/-0.002	< 0.013
9502190	01/31/95	02/07/95	0.016 +/-0.002	< 0.011
9502870	02/07/95	02/14/95	0.014 +/-0.002	< 0.014
9503292	02/14/95	02/21/95	0.013 +/-0.002	< 0.011
9503665	02/21/95	02/28/95	0.011 +/-0.002	< 0.016
9504205	02/28/95	03/07/95 *	0.018 +/-0.002	< 0.027
9504513	03/07/95	03/14/95 *	0.015 +/-0.002	< 0.017
9505217	03/14/95	03/21/95	0.007 +/-0.002	< 0.015

* See Summary of Monitoring Results, Pages 1 and 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO : 1.9
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-11, BB *

LAB NO	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500010	12/28/94	01/03/95	0.028 +/-0.003	< 0.020
9500421	01/03/95	01/10/95	0.021 +/-0.002	< 0.018
9500922	01/10/95	01/17/95	0.013 +/-0.002	< 0.015
9501267	01/17/95	01/24/95	0.009 +/-0.002	< 0.014
9501683	01/24/95	01/31/95	0.012 +/-0.002	< 0.013
9502191	01/31/95	02/07/95	0.015 +/-0.002	< 0.011
9502871	02/07/95	02/14/95	0.015 +/-0.002	< 0.014
9503293	02/14/95	02/21/95	0.013 +/-0.002	< 0.011
9503666	02/21/95	02/28/95	0.010 +/-0.002	< 0.016
9504206	02/28/95	03/07/95	0.014 +/-0.002	< 0.027
9504514	03/07/95	03/14/95	0.017 +/-0.002	< 0.017
9505218	03/14/95	03/21/95	0.008 +/-0.002	< 0.015

* See Summary of Monitoring Results, Page 1.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.10
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-6, BF *

LAB NO.	BEGIN DATE	END DATE		GROSS BETA	I-131
REQ'D LLD				0.01	0.07
9505231	03/14/95	03/21/95		0.008 +/-0.002	< 0.015
9505629	03/21/95	03/28/95		0.012 +/-0.002	< 0.019
9506106	03/28/95	04/04/95		0.014 +/-0.002	< 0.017
9506788	04/04/95	04/11/95		0.012 +/-0.002	< 0.021
9507424	04/11/95	04/18/95		0.011 +/-0.002	< 0.019
9507986	04/18/95	04/25/95		0.007 +/-0.002	< 0.049
9508515	04/25/95	05/02/95		0.020 +/-0.002	< 0.017
9509210	05/02/95	05/09/95	*	0.011 +/-0.002	< 0.046
9509553	05/09/95	05/16/95		0.010 +/-0.002	< 0.012
9510171	05/16/95	05/23/95	*	0.018 +/-0.004	< 0.042
9510600	05/23/95	05/31/95	*	0.015 +/-0.002	< 0.025
9511052	05/31/95	06/06/95		0.012 +/-0.002	< 0.023
9511817	06/06/95	06/13/95		0.012 +/-0.002	< 0.016
9512540	06/13/95	06/20/95		0.017 +/-0.002	< 0.018
9513052	06/20/95	06/27/95		0.019 +/-0.002	< 0.011
9513689	06/27/95	07/05/95		0.012 +/-0.003	< 0.022
9514078	07/05/95	07/11/95	*	0.012 +/-0.003	< 0.024
9514630	07/11/95	07/18/95		0.019 +/-0.002	< 0.013
9515382	07/18/95	07/25/95	*	0.012 +/-0.003	< 0.027
9515920	07/25/95	08/01/95	*	0.013 +/-0.003	< 0.019
9516672	08/01/95	08/08/95		0.014 +/-0.002	< 0.010
9517359	08/08/95	08/15/95	*	0.016 +/-0.003	< 0.029
9518084	08/15/95	08/22/95	*	0.019 +/-0.003	< 0.026
9518665	08/22/95	08/29/95	*	0.024 +/-0.003	< 0.018
9519447	08/29/95	09/06/95		0.025 +/-0.002	< 0.015
9519922	09/06/95	09/12/95	*	0.058 +/-0.007	< 0.035
9520484	09/12/95	09/19/95		0.024 +/-0.002	< 0.019
9520923	09/19/95	09/26/95	*	0.024 +/-0.002	< 0.012

* See Summary of Monitoring Results, Pages 1 and 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.10a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-6, BF *

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9521407	09/26/95	10/03/95	0.025 +/-0.002	< 0.049
9522104	10/03/95	10/10/95	0.013 +/-0.002	< 0.020
9522640	10/10/95	10/17/95	0.027 +/-0.003	< 0.027
9522989	10/17/95	10/24/95	0.015 +/-0.002	< 0.017
9523459	10/24/95	10/31/95 *	0.026 +/-0.005	< 0.037
9523729	10/31/95	11/07/95	0.016 +/-0.002	< 0.016
9524388	11/07/95	11/14/95 *	0.012 +/-0.003	< 0.036
9525023	11/14/95	11/21/95	0.023 +/-0.002	< 0.021
9525387	11/21/95	11/28/95 *	0.013 +/-0.003	< 0.022
9525533	11/28/95	12/05/95	0.019 +/-0.002	< 0.016
9525838	12/05/95	12/12/95	0.026 +/-0.003	< 0.015
9526501	12/12/95	12/19/95	0.008 +/-0.002	< 0.017
9526846	12/19/95	12/27/95	0.023 +/-0.002	< 0.012

* See Summary of Monitoring Results, Pages 1 and 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO : 1.11
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-7, UH ★

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9505232	03/14/95	03/21/95	0.007 +/-0.002	< 0.015
9505630	03/21/95	03/28/95	0.015 +/-0.002	< 0.019
9506107	03/28/95	04/04/95	0.016 +/-0.002	< 0.017
9506789	04/04/95	04/11/95	0.013 +/-0.002	< 0.021
9507425	04/11/95	04/18/95	0.012 +/-0.002	< 0.019
9507987	04/18/95	04/25/95	0.004 +/-0.002	< 0.049
9508516	04/25/95	05/02/95	0.018 +/-0.002	< 0.017
9509211	05/02/95	05/09/95 ★	0.011 +/-0.002	< 0.046
9509554	05/09/95	05/16/95	0.012 +/-0.002	< 0.012
9510172	05/16/95	05/23/95 ★	0.013 +/-0.005	< 0.042
9510601	05/23/95	05/31/95 ★	0.014 +/-0.002	< 0.025
9511053	05/31/95	06/06/95	0.012 +/-0.002	< 0.023
9511818	06/06/95	06/13/95	0.013 +/-0.002	< 0.016
9512541	06/13/95	06/20/95	0.018 +/-0.002	< 0.018
9513053	06/20/95	06/27/95	0.019 +/-0.002	< 0.011
9513690	06/27/95	07/05/95	0.014 +/-0.002	< 0.022
9514079	07/05/95	07/11/95	0.019 +/-0.002	< 0.024
9514631	07/11/95	07/18/95	0.018 +/-0.002	< 0.013
9515383	07/18/95	07/25/95	0.014 +/-0.002	< 0.027
9515921	07/25/95	08/01/95	0.013 +/-0.002	< 0.019
9516673	08/01/95	08/08/95	0.013 +/-0.002	< 0.010
9517360	08/08/95	08/15/95	0.016 +/-0.002	< 0.029
9518085	08/15/95	08/22/95	0.015 +/-0.004	< 0.026
9518666	08/22/95	08/29/95	0.023 +/-0.002	< 0.018
9519448	08/29/95	09/06/95	0.029 +/-0.002	< 0.015
9519923	09/06/95	09/12/95	0.036 +/-0.003	< 0.035
9520485	09/12/95	09/19/95	0.025 +/-0.002	< 0.019
9520924	09/19/95	09/26/95	0.027 +/-0.002	< 0.012

* See Summary of Monitoring Results, Pages 1 and 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.11a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: AS-7, UH *

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9521408	09/26/95	10/03/95	0.028 +/-0.002	< 0.049
9522105	10/03/95	10/10/95	0.016 +/-0.002	< 0.020
9522641	10/10/95	10/17/95	0.024 +/-0.002	< 0.027
9522990	10/17/95	10/24/95	0.020 +/-0.002	< 0.017
9523460	10/24/95	10/31/95	0.018 +/-0.002	< 0.037
9523730	10/31/95	11/07/95	0.016 +/-0.002	< 0.016
9524389	11/07/95	11/14/95	0.012 +/-0.002	< 0.036
9525024	11/14/95	11/21/95	0.027 +/-0.002	< 0.021
9525388	11/21/95	11/28/95	0.018 +/-0.003	< 0.022
9525534	11/28/95	12/05/95	0.021 +/-0.002	< 0.016
9525839	12/05/95	12/12/95	0.030 +/-0.003	< 0.015
9526502	12/12/95	12/19/95	0.013 +/-0.002	< 0.017
9526847	12/19/95	12/27/95	0.029 +/-0.002	< 0.012

* See Summary of Monitoring Results, Page 1.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO.: 1.12
SAMPLE: AIR SAMPLES, (GAMMA)
COLLECTION: QUARTERLY COMPOSITE OF WEEKLY SAMPLES
UNITS: pCi/m^3

	LOCATION	LAB NO.	BEGIN DATE	END DATE	Cs-134	Cs-137
		REQ'D LLD			0.05	0.06
	AS-1, PG	9506185	12/28/94	03/28/95	< 0.0012	< 0.0012
	AS-1, PG	9513529	03/28/95	06/27/95	< 0.0008	< 0.0007
	AS-1, PG	9521996	06/27/95	09/26/95	< 0.0007	< 0.0006
	AS-1, PG	9600209	09/26/95	12/27/95	< 0.0007	< 0.0006
	AS-3, 61VA	9506186	12/28/94	03/28/95	< 0.0010	< 0.0008
	AS-3, 61VA	9513530	03/28/95	06/27/95	< 0.0008	< 0.0006
	AS-3, 61VA	9521997	06/27/95	09/26/95	< 0.0008	< 0.0006
	AS-3, 61VA	9600210	09/26/95	12/27/95	< 0.0009	< 0.0010
	AS-5, TC	9506187	12/28/94	03/28/95	< 0.0011	< 0.0009
	AS-5, TC	9513531	03/28/95	06/27/95	< 0.0008	< 0.0007
	AS-5, TC	9521998	06/27/95	09/26/95	< 0.0008	< 0.0008
	AS-5, TC	9600211	09/26/95	12/27/95	< 0.0010	< 0.0009
*	AS-6, BF	9506188	03/14/95	03/28/95	< 0.0062	< 0.0052
	AS-6, BF	9513532	03/28/95	06/27/95	< 0.0013	< 0.0010
	AS-6, BF	9521999	06/27/95	09/26/95	< 0.0012	< 0.0010
	AS-6, BF	9600212	09/26/95	12/27/95	< 0.0007	< 0.0006
*	AS-7, UH	9506189	03/14/95	03/28/95	< 0.0063	< 0.0053
	AS-7, UH	9513533	03/28/95	06/27/95	< 0.0008	< 0.0006
	AS-7, UH	9522000	06/27/95	09/26/95	< 0.0008	< 0.0006
	AS-7, UH	9600213	09/26/95	12/27/95	< 0.0008	< 0.0010

* See Summary of Monitoring Results, Page 1.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.13
SAMPLE: AIR SAMPLES, (GAMMA)
COLLECTION: QUARTERLY COMPOSITE OF WEEKLY SAMPLES (DISCONTINUED LOCATIONS) *
UNITS: pCi/m^3

LOCATION	LAB NO.	BEGIN DATE	END DATE	Cs-134	Cs-137
	REQ'D LLD			0.05	0.06
AS-4, GJOE	9505577	12/28/94	03/21/95	< 0.0010	< 0.0008
AS-6, RS	9505581	12/28/94	03/21/95	< 0.0013	< 0.0012
AS-7, MT	9505582	12/28/94	03/21/95	< 0.0011	< 0.0008
AS-8, WR	9505578	12/28/94	03/21/95	< 0.0009	< 0.0009
AS-10, HR	9505579	12/28/94	03/21/95	< 0.0010	< 0.0010
AS-11, BB	9505580	12/28/94	03/21/95	< 0.0011	< 0.0009

* See Summary of Monitoring Results, Page 1.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 2.1
SAMPLE: CISTERN WATER, (BETA, I-131, GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: WILLIS CISTERN

LAB NO.	COLLECTION DATE	BETA	I-131	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		4.0	1.0	15	30	15	15	30	30	15	15	18	60	15
9500765	01/16/95	< 2.6	< 0.6	< 5	< 7	< 5	< 7	< 11	< 13	< 6	< 6	< 6	< 30	< 7
9500766GG	01/16/95	< 2.7	< 0.6	< 5	< 6	< 5	< 4	< 10	< 11	< 5	< 5	< 5	< 25	< 5
9503024	02/16/95	4.1 +/- 1.4	< 0.4	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 14	< 3
9503025GG	02/16/95	5.0 +/- 1.5	< 0.5	< 4	< 6	< 4	< 5	< 10	< 10	< 5	< 4	< 5	< 24	< 8
9505220	03/17/95	< 2.0	< 0.7	< 4	< 6	< 4	< 3	< 9	< 10	< 4	< 4	< 4	< 18	< 5
9507819	04/20/95	2.1 +/- 1.8	< 0.8	< 3	< 5	< 3	< 4	< 8	< 8	< 4	< 4	< 4	< 16	< 5
9509989	05/22/95	3.5 +/- 1.5	< 0.6	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9512210	06/15/95	2.3 +/- 1.8	< 0.4	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9514588	07/17/95	< 2.4	< 0.8	< 2	< 2	< 2	< 2	< 3	< 4	< 2	< 2	< 2	< 7	< 2
9517367	08/16/95	< 2.3	< 0.5	< 3	< 4	< 3	< 2	< 6	< 6	< 3	< 3	< 3	< 13	< 3
9520455	09/19/95	1.5 +/- 1.3	< 0.7	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 9	< 2
9522663	10/18/95	< 1.7	< 0.7	< 3	< 5	< 3	< 4	< 7	< 8	< 3	< 4	< 3	< 15	< 5
9524612	11/16/95	< 2.1	< 0.6	< 2	< 4	< 3	< 3	< 6	< 6	< 3	< 3	< 3	< 13	< 4
9526520	12/19/95	2.5 +/- 1.3	< 0.5	< 3	< 6	< 3	< 3	< 7	< 5	< 3	< 3	< 3	< 15	< 4

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 2.2
SAMPLE: CISTERN WATER, (H-3)
COLLECTION: QUARTERLY COMPOSITE
UNITS: pCi/L

LOCATION: WILLIS CISTERN

LAB NO.	BEGIN DATE	END DATE	H-3
REQ'D LLD			2000
9505222	01/16/95	03/17/95	< 300
9505223GG	01/16/95	03/17/95	< 300
9512212	04/20/95	06/15/95	< 320
9520457	07/17/95	09/19/95	< 320
9526522	10/18/95	12/19/95	< 290

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 2.3
SAMPLE: CISTERN WATER, (BETA, I-131, GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: MCGEE CISTERN *

LAB NO.	COLLECTION DATE	BETA	I-131	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		4.0	1.0	15	30	15	15	30	30	15	15	18	60	15
9500767	01/16/95	< 2.4	< 0.9	< 5	< 6	< 5	< 5	< 11	< 11	< 5	< 6	< 5	< 25	< 8
9500768GG	01/16/95	< 2.4	< 0.6	< 4	< 6	< 4	< 4	< 9	< 10	< 5	< 5	< 4	< 24	< 6
9503026	02/16/95	2.6 +/- 1.2	< 0.7	< 3	< 5	< 3	< 4	< 7	< 8	< 4	< 3	< 3	< 19	< 6
9503027GG	02/16/95	3.7 +/- 1.3	< 0.7	< 2	< 4	< 3	< 3	< 6	< 6	< 3	< 3	< 3	< 17	< 4
9505221	03/17/95	< 1.8	< 0.7	< 4	< 6	< 4	< 4	< 9	< 10	< 4	< 4	< 4	< 19	< 5
9507820	04/20/95	1.5 +/- 1.4	< 0.6	< 3	< 5	< 3	< 3	< 7	< 8	< 4	< 3	< 3	< 16	< 6
9512211	06/15/95	22.1 +/- 2.6	< 0.3	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 10	< 3
9514589	07/17/95	5.5 +/- 1.6	< 0.6	< 3	< 3	< 3	< 3	< 5	< 6	< 3	< 3	< 3	< 12	< 2
9517368	08/16/95	1.7 +/- 1.2	< 0.6	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 11	< 4
9520456	09/19/95	2.0 +/- 1.1	< 0.6	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9522664	10/18/95	< 2.1	< 0.6	< 2	< 2	< 2	< 2	< 3	< 4	< 2	< 2	< 2	< 7	< 3
9524613	11/16/95	< 1.9	< 0.6	< 3	< 6	< 3	< 3	< 6	< 5	< 3	< 3	< 3	< 15	< 5
9526521	12/19/95	< 1.7	< 0.6	< 3	< 5	< 3	< 3	< 6	< 5	< 3	< 3	< 3	< 14	< 3

* See Summary of Monitoring Results, Page 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. 2.4
SAMPLE: CISTERN WATER, (H-3)
COLLECTION: QUARTERLY COMPOSITE
UNITS: pCi/L

LOCATION: McGEE CISTERN *

LAB NO.	BEGIN DATE	END DATE	H-3
REQ'D LLD			2000
9505224	01/16/95	03/17/95	< 300
9505225GG	01/16/95	03/17/95	< 300
9512213 *	04/20/95	06/15/95	< 320
9520458	07/17/95	09/19/95	< 320
9526523	10/18/95	12/19/95	< 290

* See Summary of Monitoring Results, Page 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 2.5
SAMPLE: CISTERN WATER, (BETA, I-131, GAMMA)
COLLECTION: AS NEEDED
UNITS: pCi/L

LOCATION: GRAND GULF ROAD CISTERN (ALTERNATE LOCATION) *

LAB NO.	COLLECTION DATE	BETA	I-131	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		4.0	1.0	15	30	15	15	30	30	15	15	18	60	15
9510357	05/23/95	6.1 +/-1.9	< 0.6	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 7	< 2

* See Summary of Monitoring Results, Page 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 2 6
SAMPLE: CISTERN WATER, (H-3)
COLLECTION: QUARTERLY COMPOSITE
UNITS: pCi/L

LOCATION: GRAND GULF ROAD CISTERN (ALTERNATE LOCATION) *

LAB NO.	BEGIN DATE	END DATE	H-3
REQ'D LLD			2000
9512337	05/23/95	05/23/95	< 330

* See Summary of Monitoring Results, Page 1a.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 3.1
SAMPLE: GROUND WATER, (H-3, GAMMA)
COLLECTION: QUARTERLY
UNITS: pCi/L

LOCATION: PGWELL PORT GIBSON

LAB NO.	COLLECTION DATE	H-3	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		2000	15	30	15	15	30	30	15	15	18	60	15
9500327	01/03/95	< 310	< 4	< 6	< 4	< 4	< 9	< 9	< 4	< 5	< 4	< 24	< 7
9500328GG	01/03/95	< 310	< 3	< 4	< 3	< 3	< 6	< 7	< 4	< 4	< 3	< 21	< 4
9506507	04/04/95	< 300	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 11	< 3
9513695	07/05/95	< 320	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 9	< 3
9522180	10/04/95	< 290	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 10	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 3.2
SAMPLE: GROUND WATER, (H-3, GAMMA)
COLLECTION: QUARTERLY
UNITS: pCi/L

LOCATION: AAWELL, ARNOLD ACRES

LAB NO.	COLLECTION DATE	H-3	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		2000	15	30	15	15	30	30	15	15	18	60	15
9500329	01/03/95	< 310	< 3	< 4	< 3	< 3	< 6	< 7	< 4	< 4	< 3	< 19	< 4
9500330GG	01/03/95	< 310	< 3	< 4	< 3	< 3	< 6	< 6	< 3	< 3	< 3	< 17	< 5
9506508	04/04/95	< 300	< 3	< 4	< 3	< 3	< 6	< 6	< 3	< 3	< 3	< 13	< 5
9513696	07/05/95	< 320	< 3	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 12	< 3
9522181	10/06/95	< 280	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 9	< 2

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.1
SAMPLE: SURFACE WATER, GRAB (GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: MISS. RIVER UP

LAB NO.	COLLECTION DATE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		15	30	15	15	30	30	15	15	18	60	15
9500323	01/03/95	< 4	< 6	< 4	< 4	< 10	< 9	< 4	< 5	< 4	< 22	< 6
9500324GG	01/03/95	< 3	< 4	< 3	< 3	< 6	< 7	< 3	< 4	< 3	< 16	< 5
9501924	01/31/95	< 4	< 6	< 4	< 5	< 10	< 9	< 4	< 5	< 4	< 18	< 6
9504313	03/07/95	< 2	< 4	< 2	< 3	< 5	< 6	< 3	< 3	< 3	< 10	< 3
9504314GG	03/07/95	< 4	< 5	< 4	< 3	< 8	< 9	< 4	< 4	< 4	< 18	< 5
9506502	04/04/95	< 2	< 4	< 3	< 3	< 5	< 5	< 3	< 3	< 3	< 15	< 4
9508885	05/02/95	< 3	< 5	< 3	< 4	< 8	< 7	< 3	< 4	< 3	< 15	< 5
9511393	06/06/95	< 3	< 4	< 3	< 3	< 6	< 6	< 3	< 3	< 3	< 10	< 3
9514016	07/03/95	< 1	< 2	< 1	2 +/- 1	< 2	< 3	< 1	< 1	< 1	< 5	< 2
9516265	08/01/95	< 4	< 6	< 5	< 4	< 9	< 9	< 5	< 4	< 4	< 18	< 6
9519759	09/06/95	< 2	< 3	< 2	< 2	< 4	< 5	< 3	< 3	< 2	< 13	< 4
9521663	10/03/95	< 3	< 4	< 3	< 2	< 5	< 6	< 3	< 3	< 3	< 13	< 3
9523696	11/01/95	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9525647	12/05/95	< 3	< 7	< 3	< 3	< 8	< 6	< 4	< 3	< 4	< 18	< 4

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.2
SAMPLE: SURFACE WATER, (H-3)
COLLECTION: QUARTERLY COMPOSITE
UNITS: pCi/L

LOCATION: MISS. RIVER UP

LAB NO.	BEGIN DATE	END DATE	H-3
REQ'D LLD			2000
9504317	01/03/95	03/07/95	< 300
9504318GG	01/03/95	03/07/95	< 300
9511058	04/04/95	06/06/95	< 330
9519966	07/03/95	09/06/95	< 320
9525650	10/03/95	12/05/95	< 290

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.3
SAMPLE: SURFACE WATER,GRAB (GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: MISS. RIVER DOWN

LAB NO.	COLLECTION DATE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		15	30	15	15	30	30	15	15	18	60	15
9500325	01/03/95	< 4	< 4	< 3	< 3	< 8	< 8	< 4	< 4	< 3	< 20	< 4
9500326GG	01/03/95	< 3	< 4	< 3	< 3	< 6	< 7	< 3	< 4	< 3	< 19	< 4
9501925	01/31/95	< 4	< 5	< 4	< 4	< 8	< 9	< 5	< 5	< 4	< 22	< 6
9504315	03/07/95	< 2	< 3	< 2	< 2	< 6	< 6	< 3	< 3	< 3	< 11	< 3
9504316GG	03/07/95	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 9	< 2
9506503	04/04/95	< 3	< 5	< 3	< 4	< 8	< 8	< 4	< 4	< 4	< 16	< 6
9508886	05/02/95	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 9	< 3
9511394	06/06/95	< 3	< 4	< 3	< 3	< 6	< 8	< 3	< 4	< 3	< 16	< 4
9514017	07/03/95	< 3	< 4	< 3	< 3	< 6	< 7	< 3	< 3	< 3	< 14	< 5
9516266	08/01/95	< 4	< 5	< 4	< 4	< 7	< 8	< 4	< 4	< 4	< 16	< 4
9519760	09/06/95	< 2	< 4	< 2	< 3	< 5	< 5	< 3	< 3	< 2	< 13	< 4
9521664	10/03/95	< 3	< 5	< 3	< 3	< 7	< 7	< 3	< 4	< 3	< 14	< 5
9523697	11/01/95	< 3	< 6	< 3	< 3	< 7	< 6	< 3	< 3	< 3	< 19	< 4
9525648	12/05/95	< 3	< 4	< 3	< 3	< 6	< 7	< 3	< 3	< 3	< 11	< 4

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.4
SAMPLE: SURFACE WATER, (H-3)
COLLECTION: QUARTERLY COMPOSITE
UNITS: pCi/L

LOCATION: MISS. RIVER DOWN

LAB NO.	BEGIN DATE	END DATE	H-3
REQ'D LLD			2000
9504319	01/03/95	03/07/95	< 300
9504320GG	01/03/95	03/07/95	< 300
9511059	04/04/95	06/06/95	< 330
9519967	07/03/95	09/06/95	< 320
9525651	10/03/95	12/05/95	240 +/-180

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.5
SAMPLE: SURFACE WATER,COMPOSITE (GAMMA)
COLLECTION: MONTHLY COMPOSITE
UNITS: pCi/L

LOCATION: DISCHARGE BASIN

LAB NO.	BEGIN DATE	END DATE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD			15	30	15	15	30	30	15	15	18	60	15
9501926	12/30/94	01/31/95	< 3	< 6	< 4	< 4	< 8	< 8	< 4	< 4	< 4	< 16	< 4
9503921	01/31/95	03/01/95	< 2	< 2	< 2	5 +/- 2	< 4	< 4	< 2	< 2	< 2	< 9	< 2
9503922GG	01/31/95	03/01/95	< 3	< 3	< 2	7 +/- 3	< 5	< 5	< 2	< 3	< 2	< 10	< 4
9506504	03/01/95	04/04/95	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 10	< 2
9508887	04/04/95	05/01/95	< 3	< 3	< 3	< 2	< 5	< 5	< 3	< 3	< 2	< 12	< 3
9511395	05/01/95	06/01/95	3 +/- 2	< 3	< 2	14 +/- 2	< 4	< 5	< 2	< 2	< 2	< 12	< 3
9514018	06/01/95	06/30/95	< 2	< 3	< 3	9 +/- 3	< 4	< 5	< 3	< 3	< 2	< 14	< 4
9514019GG	06/01/95	06/30/95	< 2	< 3	< 2	9 +/- 2	< 4	< 4	< 2	< 2	< 2	< 11	< 3
9516267	06/30/95	08/01/95	< 2	< 2	< 2	6 +/- 2	< 4	< 5	< 2	< 2	< 2	< 8	< 2
9519761	08/01/95	09/01/95	< 2	< 3	< 2	5 +/- 1	< 4	< 5	< 2	< 2	< 2	< 13	< 3
9521665	09/01/95	10/02/95	< 2	< 3	< 2	6 +/- 2	< 4	< 4	< 2	< 2	< 2	< 9	< 4
9523698	10/02/95	11/01/95	< 2	< 4	< 2	4 +/- 1	< 5	< 4	< 2	< 2	< 2	< 12	< 3
9525469	11/01/95	12/01/95	< 3	< 3	< 2	8 +/- 2	< 5	< 5	< 3	< 3	< 2	< 11	< 3
9600197	12/01/95	01/02/96	< 2	< 4	< 2	3 +/-1	< 6	< 4	< 2	< 2	< 2	< 13	< 4
9600200GG	12/01/95	01/02/96	< 3	< 4	< 3	4+/-3	< 6	< 6	< 3	< 3	< 3	< 13	< 4

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.6
SAMPLE: SURFACE WATER, (H-3)
COLLECTION: QUARTERLY COMPOSITE
UNITS: pCi/L

LOCATION: DISCHARGE BASIN

LAB NO.	BEGIN DATE	END DATE	H-3
REQ'D LLD			2000
9506505GG	12/30/94	04/04/95	8410 +/- 250
9506506	12/30/94	04/04/95	8270 +/- 250
9514020	04/04/95	06/30/95	5470 +/- 240
9514021GG	04/04/95	06/30/95	5460 +/- 240
9521666	06/30/95	10/02/95	10090 +/- 260
9600201	10/02/95	01/02/96	11430 +/-280

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 5.1
SAMPLE: VEGETATION: BROADLEAF, (I-131, GAMMA)
COLLECTION: MONTHLY WHEN AVAILABLE
UNITS: pCi/kg

LOCATION: SECTOR K, 17 KM

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9500528	01/11/95	COLLARDS	< 24	< 26	< 21
9500529	01/11/95	RAPE	< 23	< 22	< 22
9500530	01/11/95	KALE	< 33	< 33	< 23
9502812	02/13/95	RAPE	< 21	< 19	< 15
9502813	02/13/95	COLLARDS	<17	< 13	< 14
9502814	02/13/95	KALE	< 22	< 20	< 24
9504599	03/15/95	COLLARDS	< 19	< 20	< 16
9504600	03/15/95	MUSTARDS	< 21	< 20	< 16
9504601	03/15/95	RAPE	< 20	< 23	< 18
9507036	04/13/95	RAPE	< 13	< 16	< 13
9507037	04/13/95	KALE	< 18	< 18	< 16
9507038	04/13/95	COLLARDS	< 16	< 19	< 16
9509592GG	05/17/95	KALE	< 21	< 19	< 17
9509593	05/17/95	RAPE	< 21	< 21	< 23
9509594GG	05/17/95	RAPE	< 22	< 19	< 19
9509595	05/17/95	COLLARDS	< 17	< 15	< 15
9509596GG	05/17/95	COLLARDS	< 17	< 21	< 15
9509597	05/17/95	KALE	< 19	< 19	< 20
9511999	06/14/95	KALE	< 11	< 11	< 9
9512000	06/14/95	SWISS CHARD	< 12	< 12	< 11
9512001	06/14/95	COLLARDS	< 15	< 19	< 18

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 5.1a
SAMPLE: VEGETATION: BROADLEAF, (I-131, GAMMA)
COLLECTION: MONTHLY WHEN AVAILABLE
UNITS: pCi/kg

LOCATION: SECTOR K, 17 KM

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9514263	07/12/95	KALE	< 16	< 18	< 14
9514264	07/12/95	COLLARDS	< 18	< 17	< 14
9514265	07/12/95	RAPE	< 16	< 18	< 15
9514272GG	07/12/95	KALE	< 13	< 14	< 11
9517215	08/15/95	KALE	< 19	< 15	< 19
9517216	08/15/95	RAPE	< 15	< 15	< 14
9517217	08/15/95	COLLARDS	< 10	< 9	< 8
9520446	09/18/95	KALE	< 25	< 25	< 24
9520447	09/18/95	WATERMELON	< 21	< 26	< 19
9520448	09/18/95	CANTALOUPE	< 33	< 32	< 25
9522429	10/16/95	EWDINE	< 22	< 25	< 24
9522430	10/16/95	KALE	< 17	< 16	< 15
9522431	10/16/95	COLLARDS	< 11	< 11	< 9
9524486	11/15/95	RAPE	< 20	< 26	< 22
9524487	11/15/95	COLLARDS	< 18	< 21	< 12
9524488	11/15/95	BROCCOLI	< 27	< 31	< 23
9526270	12/15/95	COLLARDS	< 26	< 20	< 20
9526271	12/15/95	MUSTARD GREENS	< 17	< 11	< 13
9526272	12/15/95	RAPE	< 18	< 14	< 16

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 5.2
SAMPLE: VEGETATION: BROADLEAF, (I-131, GAMMA)
COLLECTION: MONTHLY WHEN AVAILABLE
UNITS: pCi/kg

LOCATION: SECTOR J, 0.6 KM

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9500531	01/11/95	SWISS CHARD	< 21	< 23	< 16
9500532	01/11/95	KALE	< 27	< 20	< 19
9500533	01/11/95	COLLARDS	< 24	< 23	< 23
9502815	02/13/95	RAPE	< 23	< 21	< 21
9502816	02/13/95	SWISS CHARD	< 23	< 25	< 19
9502817	02/13/95	COLLARDS	< 25	< 21	< 22
9504602	03/15/95	COLLARDS	< 22	< 18	< 18
9504603	03/15/95	RAPE	< 36	< 32	< 26
9504604	03/15/95	KALE	< 33	< 31	< 28
9507039	04/13/95	KALE	< 17	< 17	< 15
9507040	04/13/95	SWISS CHARD	< 14	< 16	< 13
9507041	04/13/95	COLLARDS	< 16	< 18	< 17
9509598GG	05/17/95	SWISS CHARD	< 14	< 17	< 12
9509599	05/17/95	SWISS CHARD	< 14	< 20	< 19
9509600GG	05/17/95	BRUSSEL SPROUTS	< 20	< 24	< 21
9509601	05/17/95	KALE	< 24	< 20	< 22
9509602GG	05/17/95	KALE	< 10	< 15	< 11
9509603	05/17/95	BRUSSEL SPROUTS	< 24	< 22	< 19
9512002	06/14/95	BRUSSEL SPROUTS	< 11	< 11	< 10
9512003	06/14/95	RAPE	< 16	< 17	< 14
9512004	06/14/95	ENDIVE	< 15	< 18	< 17

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 5.2a
SAMPLE: VEGETATION: BROADLEAF, (I-131, GAMMA)
COLLECTION: MONTHLY WHEN AVAILABLE
UNITS: pCi/kg

LOCATION: SECTOR J, 0.6 KM

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9514266	07/12/95	BROCCOLI	< 18	< 19	< 16
9514267	07/12/95	BRUSSEL SPROUTS	< 20	< 17	< 16
9514268	07/12/95	COLLARDS	< 12	< 15	< 11
9514273GG	07/12/95	SWISS CHARD	< 15	< 15	< 17
9517218	08/15/95	EGGPLANT	< 11	< 9	< 10
9517219	08/15/95	SQUASH	< 11	< 9	< 9
9517220	08/15/95	BROCCOLI	< 21	< 26	< 21
9520449	09/18/95	EGGPLANT	< 28	< 30	< 24
9520450	09/18/95	BROCCOLI	< 23	< 24	< 20
9520451	09/18/95	COLLARDS	< 16	< 15	<17
9522432	10/16/95	EGGPLANT	< 22	< 30	< 26
9522433	10/16/95	COLLARDS	< 19	< 18	< 18
9522434	10/16/95	BROCCOLI	< 25	< 23	< 20
9524489	11/15/95	BROCCOLI	< 19	< 19	< 16
9524490	11/15/95	RAPE	< 13	< 14	< 14
9524491	11/15/95	EGGPLANT	< 17	< 19	< 15
9526273	12/15/95	CABBAGE	< 21	< 16	< 17
9526274	12/15/95	BROCCOLI	< 20	< 14	< 17
9526275	12/15/95	COLLARDS	< 32	< 22	< 25

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 5.3
SAMPLE: VEGETATION: BROADLEAF, (I-131, GAMMA)
COLLECTION: MONTHLY WHEN AVAILABLE
UNITS: pCi/kg

LOCATION: SECTOR R, 1.2 KM *

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9500534	01/11/95	MUSTARD GREENS	< 28	< 24	< 22
9500535	01/11/95	COLLARDS	< 21	< 17	< 20
9500536	01/11/95	TURNIP GREENS	< 26	< 22	< 22
9502818	02/13/95	RAPE	< 12	< 15	< 14
9502819	02/13/95	MUSTARD	< 14	< 14	< 12
9502820	02/13/95	TURNIPS	< 27	< 22	< 23
9504605	03/15/95	COLLARDS	< 19	< 24	< 19
9504606	03/15/95	MUSTARDS	< 25	< 26	< 22
9504607	03/15/95	RAPE	< 17	< 20	< 21
9507042	04/13/95	COLLARDS	< 17	< 17	< 17
9507043	04/13/95	SWISS CHARD	< 14	< 19	< 14
9507044	04/13/95	MUSTARD GREENS	< 14	< 15	< 16
9509604GG	05/17/95	COLLARDS	< 19	< 26	< 18
9509605	05/17/95	KALE	< 23	< 21	< 23
9509606GG	05/17/95	SWISS CHARD	< 13	< 18	< 15
9509607	05/17/95	SWISS CHARD	< 19	< 20	< 16
9509608GG	05/17/95	KALE	< 22	< 18	< 19
9509609	05/17/95	SUNFLOWER LEAVES	< 24	< 25	< 23
9512005	06/14/95	SWISS CHARD	< 21	< 17	< 16
9512006	06/14/95	RAPE	< 36	< 33	< 29
9512007	06/14/95	BROCCOLI	< 19	< 25	< 19

* See Summary of Monitoring Results, Page 1.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO.: 5.4
SAMPLE: VEGETATION: BROADLEAF, (I-131, GAMMA)
COLLECTION: MONTHLY WHEN AVAILABLE
UNITS: pCi/kg

LOCATION: SECTOR H, 0.64 KM *

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9514269	07/12/95	COLLARDS	< 10	< 11	< 9
9514270	07/12/95	KALE	< 18	< 18	< 20
9514271	07/12/95	SQUASH	< 20	< 20	< 17
9514274GG	07/12/95	TURNIP GREENS	< 22	< 18	< 18
9517221	08/15/95	SQUASH	< 15	< 15	< 15
9517222	08/15/95	KALE	< 16	< 16	< 15
9517223	08/15/95	COLLARDS	< 11	< 12	< 14
9520452	09/18/95	COLLARDS	< 25	< 29	< 25
9520453	09/18/95	SQUASH	< 25	< 27	< 20
9520454	09/18/95	KALE	< 23	< 21	< 22
9522435	10/16/95	COLLARDS	< 17	< 17	< 14
9522436	10/16/95	SWISS CHARD	< 17	< 19	< 14
9522437	10/16/95	KALE	< 20	< 25	< 19
9524492	11/15/95	RAPE	< 15	< 17	< 15
9524493	11/15/95	CABBAGE	< 20	< 20	< 20
9524494	11/15/95	COLLARDS	< 23	< 20	< 24
9526276	12/15/95	RAPE	< 18	< 13	< 12
9526277	12/15/95	CABBAGE	< 15	< 16	< 12
9526278	12/15/95	COLLARDS	< 14	< 11	< 9

* See Summary of Monitoring Results, Page 1.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO.: 6.1
SAMPLE: MILK SAMPLES, (I-131, GAMMA)
COLLECTION: SEMIANNUALLY
UNITS: pCi/L

LOCATION: ALCORN STATE

LAB NO.	COLLECTION DATE	I-131	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		1.0	15	18	60	15
9509987	05/18/95	< 0.9	< 3	< 3	< 13	< 4
9509988GG	05/18/95	< 0.6	< 2	< 1	< 6	< 2
9524611	11/15/95	< 0.6	< 3	< 3	< 10	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 7.1
SAMPLE: FISH SAMPLES, (GAMMA)
COLLECTION: SEMIANNUALLY
UNITS: pCi/kg

LOCATION : MISS. RIVER UP

LAB NO.	COLLECTION DATE	SAMPLE TYPE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137
REQ'D LLD			130	260	130	130	260	130	150
9509610	05/12/95	SPOONBILL	< 9	< 13	< 9	< 8	< 20	< 10	< 9
9525343	11/27/95	BUFFALO	< 10	< 23	< 9	< 12	< 26	< 10	< 10
9525345GG	11/27/95	CATFISH	< 14	< 19	< 15	< 15	< 27	< 15	< 14

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 7.2
SAMPLE: FISH SAMPLES, (GAMMA)
COLLECTION: SEMIANNUALLY
UNITS: pCi/kg

LOCATION : MISS. RIVER DOWN

LAB NO.	COLLECTION DATE	SAMPLE TYPE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137
REQ'D LLD			130	260	130	130	260	130	150
9509611	05/12/95	CARP	< 7	< 12	< 8	< 7	< 17	< 8	< 7
9525344	11/27/95	GOO	< 17	< 36	< 17	< 16	< 40	< 16	< 18
9525346GG	11/27/95	GOO	< 15	< 24	< 15	< 17	< 36	< 19	< 18

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 8.1
SAMPLE: SEDIMENT, (GAMMA)
COLLECTION: SEMIANNUALLY
UNITS: pCi/kg

LOCATION	LAB NO.	COLLECTION DATE	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Cs-134	Cs-137
	REQ'D LLD		N/A	N/A	N/A	N/A	N/A	150	180
SEDCONT, UPSTREAM	9511070	06/06/95	< 94	< 9	< 15	< 9	< 8	< 11	< 7
SEDCONT"GG", UPSTREAM	9511069	06/06/95	< 113	< 6	< 16	< 10	< 8	< 12	< 7
SEDCONT, UPSTREAM	9525485	12/01/95	< 69	< 8	< 12	< 8	< 7	< 10	8 +/- 6
SEDBAR, BARGE SLIP	9511072	06/06/95	< 198	276 +/- 21	< 30	42 +/- 15	473 +/- 25	< 22	126 +/- 19
SEDBAR"GG", BARGE SLIP	9511071	06/06/95	< 152	271 +/- 17	< 25	36 +/- 12	487 +/- 22	< 19	122 +/- 13
SEDBAR, BARGE SLIP	9525486	12/01/95	< 93	21 +/- 2	< 26	< 11	17 +/- 3	< 13	39 +/- 3
SEDHAM, HAMILTON L.	9511074	06/06/95	< 171	< 10	< 23	< 15	< 13	< 17	52 +/- 12
SEDHAM"GG", HAMILTON L.	9511073	06/06/95	< 147	< 13	< 23	< 13	< 13	< 16	43 +/- 10
SEDHAM, HAMILTON L.	9525487	12/01/95	< 124	< 15	< 33	< 14	< 14	< 17	60 +/- 5

EPA CROSS CHECK RESULTS

EPA PREP DATE	DATE RESULTS ISSUED	MEDIA	NUCLIDE	EPA RESULTS	ESI, SYSTEM CHEMISTRY RESULTS	NORM DEV. KNOWN
09/30/94	02/06/95	MILK GAMMA (pCi/L)	I-131	75.0	71.67	-0.72
			Cs-137	59.0	62.67	1.27
			K (Total)	1715.0	1653.33	-1.24
10/28/94	02/13/95	WATER (pCi/L)	Gross Beta	23.0	19.00	-1.39
11/04/94	02/14/95	WATER* (pCi/L)	Co-60	59.0	69.33	3.58*
			Zn-65	100.0	128.33	4.91*
			Cs-134	24.0	27.33	1.15
			Cs-137	49.0	60.33	3.93*
			Ba-133	73.0	97.00	5.94*
02/03/95	04/21/95	WATER (pCi/L)	I-131	100.0	100.00	0.00
03/10/95	05/18/95	WATER (pCi/L)	Tritium	7435.00	7030.00	-0.94
04/18/95	08/16/95	BLIND B (pCi/L)	Co-60	29.0	29.33	0.12
			Cs-134	20.0	18.67	-0.46
			Cs-137	11.0	11.00	0.00
			Gross Beta	86.8	77.93	-1.50
06/09/95	Unofficial	WATER (pCi/L)	Co-60	40.0	39.66	-0.12
			Zn-65	76.0	80.00	0.87
			Cs-134	50.0	45.00	-1.73
			Cs-137	35.0	35.66	0.23
			Ba-133	79.0	76.66	-0.51
07/21/95	10/31/95	WATER (pCi/L)	Gross Beta	19.4	23.4	1.37
08/04/95	10/02/95	WATER (pCi/L)	Tritium	4872.0	4823.33	-0.17

* Each isotope measured by ESI was 14-33% higher than values reported by the U.S. EPA. When EPA published the results on 2/14/95, the ESI cross-check sample had been disposed of. Because the EPA sample was inadvertently disposed, no follow-up action could be taken on that particulate sample. Since all measurements made by ESI were higher than the EPA values, it appears that a dilution error when preparing the sample was the cause for the discrepancy between ESI values and the EPA values. A new liquid standard was purchased from Analytics, Inc. in March 1995 and new efficiency curves were calculated using a 3.5 liter Marinelli geometry. There were no appreciative differences between the efficiency curves calculated before and after the Nov 4, 1994 cross-check sample was analyzed. A 3.5L resin standard prepared by Analytics, Inc. was analyzed, resulting in efficiency curves which were approximately 90 percent as efficient as deionized water. These results are theoretically in agreement since the Analytics, Inc. resin standard has a density of 1.15 kg/L. No data from gamma spectroscopy would be affected by this apparent dilution error.

Attachment II

1995 Thermoluminescent Dosimetry Report

GRAND GULF NUCLEAR STATION

1995 THERMOLUMINESCENT DOSIMETRY REPORT

JANUARY - DECEMBER

ANALYSIS BY : Waterford3 Dosimetry

TABLE 1

Inner Ring TLDs, Within Two (2) Mile Radius

Required by ODCM Specifications

Location	1st Qtr ' 95 (mrem)	2nd Qtr ' 95 (mrem)	3rd QTR ' 95 (mrem)	4th Qtr ' 95 (mrem)	Mean ' 95 (mrem)
M-16 *	21.0	(2)	29.0 (3)	20.5	**23.5**
M-17	24.0	19.5	24.3	22.0	**22.5**
M-19	21.0	20.0	20.0	19.0	**20.0**
M-20	(1)	18.0	17.5	19.0	**18.2**
M-21	23.0	21.0	22.0	23.0	**22.3**
M-22	19.5	24.0	18.5	27.5 (3)	**22.4**
M-23	20.0	26.5 (3)	19.5	21.5	**21.9**
M-25	16.5	(2)	18.0	19.5	**18.0**
M-27	23.5	23.5 (3)	20.5	21.5	**22.3**
M-28	19.5	21.0	19.0	21.5	**20.3**
M-41	15.0	16.5	13.5	14.5	**14.9**
M-45	17.0	18.5	17.0	16.5	**17.3**
M-86	18.0	16.5	16.0	17.0	**16.9**
M-92	17.0	16.0	16.0	16.0	**16.3**
M-93	23.5	19.5	22.0	20.5	**21.4**
M-94	20.0	18.5	20.0	18.5	**19.3**
Mean ± s.d.	**19.9 ± 2.8**	**19.9 ± 3.1**	**20.0 ± 3.7**	**19.9 ± 3.1**	

* **Location with highest annual mean.**

(1) Value not representative of historical readings, therefore not used; TLD may have been damaged by water.

(2) No data; TLD missing in field.

(3) Data not consistent with previous quarters; TLD may have been damaged by water.

TABLE 2

Outer Ring TLDs, Within Six (6) Mile Radius

Required by ODCM Specifications

Location	1st Qtr ' 95 (mrem)	2nd Qtr ' 95 (mrem)	3rd Qtr ' 95 (mrem)	4th Qtr ' 95 (mrem)	Mean ' 95 (mrem)
M-36	18.5	18.5	18.0	17.5	**18.1**
M-40 *	23.0	20.0	20.0	23.5	**21.6**
M-47	17.5	(2)	16.0	17.5	**17.0**
M-48	18.5	20.5	18.5	24.0	**20.4**
M-49	20.0	21.5	19.5	21.5	**20.6**
M-50	19.0	20.0	19.0	19.0	**19.3**
M-51	17.0	19.0	17.0	17.5	**17.6**
M-55	20.0	21.0	19.0	19.0	**19.8**
M-56	19.5	21.0	19.5	19.0	**19.8**
M-57	19.5	20.5	18.0	20.0	**19.5**
M-58	14.0	(2)	(2)	15.5	**14.8**
M-59	16.0	25.0 (1)	15.0	15.0	**17.8**
M-88	24.5 (1)	29.0 (1)	14.5	16.5	**21.1**
M-89	18.0	20.5	17.0	20.0	**18.9**
M-90	17.0	(2)	(2)	17.0	**17.0**
M-91	18.0	19.0	18.0	22.5	**19.4**
Mean ± s.d.	**18.8 ± 2.5**	**21.2 ± 2.8**	**17.8 ± 1.7**	**19.1 ± 2.7**	

* **Location with highest annual mean.**

(1) Data not consistent with previous quarters; TLD may have been damaged by water.

(2) No data; TLD was missing in field.

TABLE 3

Special Interest Area TLDs

Required by ODCM Specifications

Location	1st Qtr ' 95 (mrem)	2nd Qtr ' 95 (mrem)	3rd Qtr ' 95 (mrem)	4th Qtr ' 95 (mrem)	Mean ' 95 (mrem)
M-01 *	21.5	21.0	20.0	22.5	**21.3**
M-07	20.5	21.0	20.0	20.0	**20.4**
M-09	20.5	20.5	18.5	19.0	**19.6**
M-10	19.0	19.0	17.5	19.0	**18.6**
M-33	18.0	(1)	17.5	18.5	**18.0**
M-38	18.0	(1)	17.0	21.0	**18.7**
M-39	17.0	20.0	17.0	18.0	**18.0**
Mean ± s.d.	**19.2 ± 1.7**	**20.3 ± 0.8**	**18.2 ± 1.3**	**19.7 ± 1.6**	

Control TLD

Location	1st Qtr ' 95 (mrem)	2nd Qtr ' 95 (mrem)	3rd Qtr ' 95 (mrem)	4th Qtr ' 95 (mrem)	Mean ' 95 (mrem)
M-14	21.0	21.5	20.5	20.0	**20.8**

Shield TLD

Location	1st Qtr ' 95 (mrem)	2nd Qtr ' 95 (mrem)	3rd Qtr ' 95 (mrem)	4th Qtr ' 95 (mrem)	Mean ' 95 (mrem)
M-00	11.0	11.0	9.0	9.0	**10.0**

* **Location with highest annual mean.**

(1) No data; TLD was missing in field.

TABLE 4

Protected Area Boundary

Not Required by ODCM Specifications

Location	1st Qtr ' 95 (mrem)	2nd Qtr ' 95 (mrem)	3rd Qtr ' 95 (mrem)	4th Qtr ' 95 (mrem)	Mean ' 95 (mrem)
M-61	40.5	20.0	34.5	42.0	34.3
M-62	55.5	22.0	44.5	53.0	43.8
M-63	20.0	16.5	18.5	22.5	19.4
M-64	24.0	19.5	19.0	23.0	21.4
M-65	21.5	18.0	22.0	21.5	20.8
M-66	23.0	18.0	23.5	23.5	22.0
M-67	29.0	(1)	26.5	28.5	28.0
M-68	57.0	28.0	57.0	63.5	51.4
M-69 *	81.0	28.0	56.0	78.0	60.8
M-70	65.5	24.5	52.5	64.0	51.6
M-71	24.5	15.0	21.0	24.5	21.3
M-72	21.0	14.5	17.5	21.5	18.6
M-74	18.5	18.0	15.0	16.0	16.9
M-76	20.5	15.0	18.5	18.5	18.1
M-77	19.0	15.0	17.0	17.0	17.0
M-81	19.0	18.0	16.0	22.0	18.8
Mean ± s.d.	33.7 ± 20.0	19.3 ± 4.5	28.7 ± 15.2	33.7 ±19.9	

Duplicate TLDs

Location	1st Qtr ' 95 (mrem)	2nd Qtr ' 95 (mrem)	3rd Qtr ' 95 (mrem)	4th Qtr ' 95 (mrem)	Mean ' 95 (mrem)
M-31	19.0	19.0	18.0	19.0	18.8
M-32	18.5	(1)	17.0	19.0	18.2
M-60	22.0	20.0	19.5	18.0	19.9
Mean ± s.d.	19.8 ± 1.9	19.5 ± 0.7	18.2 ± 1.3	18.7 ± 0.6	

* Location with highest annual mean.

(1) No data; TLD was missing in field.