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River Bend Station - Unit 1  
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Dear Sir or Madam,

Enclosed is the River Bend Station (RBS) Annual Radiological Environmental Operating Report for the period January 1, 2010, through December 31, 2010. This report is submitted in accordance with the RBS Technical Specifications, Section 5.6.2.

Should you have any questions regarding the enclosed information, please contact Mr. David Lorfing at (225) 381-4157.

Sincerely,

  
David N. Lorfing

DNL/wjf  
enclosure

JE25  
MLL

Radiological Environmental Operating Report for 2010  
Page 2 of 2

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**RIVER BEND STATION**

**ANNUAL RADIOLOGICAL ENVIRONMENTAL  
OPERATING REPORT FOR 2010**

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## **Summary**

The Annual Radiological Environmental Operating Report presents data obtained through analyses of environmental samples collected for the River Bend Station (RBS) Radiological Environmental Monitoring Program (REMP) for the period January 1, 2010 through December 31, 2010. This report fulfills a requirement specified in RBS Technical Requirements Manual (TRM) 5.6.2 as required by Technical Specification 5.6.2 of Appendix A to RBS License Number NPF-47. During 2010, REMP results remained at background levels, as has been the case in previous years.

All required lower limit of detection (LLD) capabilities were achieved in all sample analyses during 2010. No measurable levels of radiation above baseline levels were detected in the vicinity of River Bend Station. The 2010 Radiological Environmental Monitoring Program thus substantiated the adequacy of source control and effluent monitoring at River Bend Station with no observed impact of plant operations on the environment.

### **Radiological Environmental Monitoring Program**

RBS established the REMP prior to the station's becoming operational (1985) to provide data on background radiation and radioactivity normally present in the area. RBS has continued to monitor the environment by sampling air, water, sediment, fish and food products, as well as measuring direct radiation. RBS also samples milk if milk-producing animals used for human consumption are present within five miles (8 km) of the plant.

The REMP includes sampling indicator and control locations within an approximate 20 mile radius of the plant. The REMP 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. RBS personnel compare indicator results with control and preoperational results to assess any impact RBS operation might have had on the surrounding environment.

In 2010, environmental samples were collected for radiological analysis. The results of indicator locations were compared with control locations and previous studies. It was concluded that overall, no significant relationship exists between RBS operation and effect on the area around the plant. The review of 2010 data, in many cases, showed radioactivity levels in the environment were undetectable in many locations and near background levels in significant pathways.

### **Harmful Effects or Irreversible Damage**

The REMP monitoring did not detect any harmful effects or evidence of irreversible damage in 2010. Therefore, no analysis or planned course of action to alleviate problems was necessary.

### **Reporting Levels**

RBS's review indicates that no samples equaled or exceeded reporting levels for radioactivity concentration in environmental samples, as outlined in RBS Technical Requirements Manual Table 3.12.1-2, when averaged over any calendar quarter. Therefore, 2010 results did not result in any Radiological Monitoring Program Special Reports.

### **Radioactivity Not Attributable to RBS**

The RBS REMP detected no radioactivity attributable to other sources during year 2010. Following the radioactive plume release due to reactor core degradation at the Chernobyl Nuclear Power Plant in 1986, RBS REMP detected I-131 in water, vegetation, and air samples. I-131 was also detected during 1998 in the wastewater treatment plant effluent. This was attributed to the medical treatment of a RBS employee. In 2006, Cs-137 was detected in upstream and downstream Mississippi River sediment samples. This activity was not present in the 2010 samples.

### **Comparison to Federal and State Programs**

RBS personnel compared REMP data to federal and state monitoring programs as results became available. Historically, the programs used for comparison have included the U.S. Nuclear Regulatory Commission (NRC) TLD (Thermoluminescent Dosimeter) Direct Radiation Monitoring Network and the Environmental Radiological Laboratory – Department of Environmental Quality Laboratory Services Division (ERL-DEQLSD).

The NRC TLD Network Program was discontinued in 1998. Historically these results have compared to those from the RBS REMP. RBS TLD results continue to remain similar to the historical average and continue to verify that plant operation is not affecting the ambient radiation levels in the environment.

The ERL-DEQLSD and the RBS REMP entail similar radiological environmental monitoring program requirements. These programs include co-located air sample locations, and splitting or sharing sample media such as water, fish and food products. Both programs have obtained similar results over previous years.

### **Sample Deviations**

#### **◆ Milk**

The REMP did not include milk sampling within five miles (8 km) of RBS in 2010 due to unavailability of milk-producing animals used for human consumption. The RBS Technical Requirements Manual requires collection of milk samples if available commercially within 8 km (5 miles) of the plant. RBS personnel collected vegetation samples to monitor the ingestion pathway, as specified in RBS Technical Requirements Manual Table 3.12.1-1, because of milk unavailability.

◆ **Required Lower Limit of Detection (LLD) Values**

All LLDs during this reporting period were more conservative than the acceptable limits required by the RBS Technical Requirement Manual (TRM).

◆ **Sampling Deviations**

Listed below are sampling deviations that occurred during 2010. No LLD values were exceeded in the air sampling deviations. As described in footnote (a) to RBS Technical Requirements Manual Table 3.12.1-1, deviations are permitted from the required sampling schedule due to malfunction of equipment or other legitimate reasons.

Station	Sampling Period	Problem Description	Comment
AN1 AP1	03/09/10 to 03/23/10	Power Outage	Air sampler location AP1 and AN1 were short, for period 03-9-10 to 03-23-10. (CR-RBS-2010-1344)
AN1	03/23/10 to 04/07/10	Power Outage	Air sampler location AN1 was short 54.3 hours for period 03-23-10 to 04-7-10. (CR-RBS-2010-1547)
AN1	04/20/10 to 05/04/10	Power Outage	Air sampler location AN1 was short 45.8 hours, for period 04-20-10 to 05-4-10. (CR-RBS-2010-2016)
AN1 AP1	08/10/10 to 08/24/10	Power Outage	Air sampler location AP1 and AN1 were short, for period 08-10-10 to 8-24-10. (CR-RBS-2010-4127)
TEC	3 <sup>rd</sup> Quarter 2010	Missing Results	TLD not shipped to vendor. TLD results not available. (CR-RBS-2010-6587)

◆ **Missed Samples**

No samples were missed during 2010.

◆ **Unavailable Results**

Results of one TLD from the third quarter 2010 from location TEC was unavailable due to the TLD results not being available. This deviation is noted above.

**Program Modifications**

RBS made no modifications to the REMP during the year 2010.

## **Attachments**

Attachment 1 contains results of air, TLD, water, sediment, fish, food products and special samples collected in 2010. TLDs were analyzed by AREVA. The River Bend Station Environmental Laboratory analyzed all remaining samples. Attachment 1 also contains RBS' participation in the Interlaboratory Comparison Program during the year 2010.

## **1. Introduction**

### **1.1. Radiological Environmental Monitoring Program**

RBS established the REMP to ensure that plant operating controls properly function to minimize any associated radiation endangerment to human health or the environment. The REMP is designed for the following:

- 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 RBS.
- Correlating levels of radiation and radioactivity in the environment with radioactive releases from station operation.

### **1.2. Pathways Monitored**

The airborne, direct radiation, waterborne and ingestion pathways, as seen in Figure 1-1, are monitored as required by the RBS Technical Requirements Manual 3.12.1. A description of the RBS REMP sample locations utilized to monitor exposure pathways are described in Table 1.1 and shown in Figures 1-2 and 1-3. RBS may occasionally supplement this program with additional sampling in order to provide a comprehensive and well-balanced program.

Section 2.0 of this report provides a discussion of 2010 sampling results with Section 3.0 providing a summary of results for the monitored exposure pathways.

### **1.3. Land Use Census**

RBS personnel conduct a land use census biannually as required by RBS Technical Requirements Manual 3.12.2. The last land use census was performed in 2010. The next scheduled Land Use Census will be performed in 2012. Section 2.8 of this report contains a narrative on the results of the 2010 land use census.

**Table 1.1**  
**Radiological Environmental Sampling Program**

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Airborne	<p><b><u>Radioiodine and Particulates</u></b> 2 samples from close to the 2 SITE BOUNDARY locations, in different sectors, of the highest calculated annual average ground level D/Q.</p>	<p>AN1 (0.9 km W) - RBS site Hwy 965; 0.4 km south of Activity Center.</p> <p>AP1 (0.9 km WNW) – Behind River Bend Station Activity Center.</p>	Continuous sampler operation with sample collection every two weeks, or more frequently if required by dust loading.	<p>Radioiodine Canisters – I-131 analysis every two weeks.</p> <p>Air Particulate – Gross beta radioactivity analysis following filter change.</p>
	<p><b><u>Radioiodine and Particulates</u></b> 1 sample from the vicinity of a community having the highest calculated annual average ground level D/Q.</p>	<p>AQS2 (5.8 km NW) - St. Francis Substation on US Hwy. (Bus.) 61 in St. Francisville.</p>		
	<p><b><u>Radioiodine and Particulates</u></b> 1 sample from a control location, as for example 15 - 30 km distance and in the least prevalent wind direction.</p>	<p>AGC (17.0 km SE) – Entergy Service Center compound in Zachary. (Control)</p>		
Direct Radiation	<p><b><u>TLDs</u></b> One ring of stations, one in each meteorological sector in the general area of the SITE BOUNDARY.</p>	<p>TA1 (1.7 km N) - River Bend Training Center.</p> <p>TB1 (0.5 km NNE) - Utility pole near River Bend Station cooling tower yard area.</p> <p>TC1 (1.7 km NE) - Telephone pole at Jct. US Hwy. 61 and Old Highway 61.</p>	Quarterly	mR exposure quarterly.

**Table 1.1**

**Radiological Environmental Sampling Program**

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	<p><b><u>TLDs</u></b>                      One ring of stations, one in each meteorological sector in the general area of the SITE BOUNDARY.</p>	<p><b>TD1 (1.6 km ENE)</b> – Stub pole along WF7, 150m S of Jct. WF7 and US Hwy. 61.</p> <p><b>TE1 (1.3 km E)</b> – Stub pole along WF7, 1 km S of Jct. WF7 and US Hwy. 61.</p> <p><b>TF1 (1.3 km ESE)</b> – Stub pole along WF7, 1.6 km S of Jct. WF7 and US Hwy. 61.</p> <p><b>TG1 (1.6 km SE)</b> – Stub pole along WF7, 2 km S of Jct. WF7 and US Hwy. 61.</p> <p><b>TH1 (1.7 km SSE)</b> – Stub pole at power line crossing of WF7 (near Grants Bayou).</p> <p><b>TJ1 (1.5 km S)</b> – Stub pole near River Bend Station Gate #23 on Powell Station Road (LA Hwy. 965).</p> <p><b>TK1 (0.9 km SSW)</b> – Utility pole on Powell Station Road (LA Hwy. 965), 20 m S of River Bend Station River Access Road.</p> <p><b>TL1 (1.0 km SW)</b> – First utility pole on Powell Station Road (LA Hwy. 965) S of former Illinois Central Gulf RR crossing.</p>	Quarterly	mR exposure quarterly.

**Table 1.1**

**Radiological Environmental Sampling Program**

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	<p><b><u>TLDs</u></b> One ring of stations, one in each meteorological sector in the general area of the SITE BOUNDARY.</p>	<p><b>TM1 (0.9 km WSW)</b> - Third utility pole on Powell Station Road (LA Hwy. 965) N of former Illinois Central Gulf RR crossing.</p> <p><b>TN1 (0.9 km W)</b> - Utility pole along Powell Station Road (LA Hwy. 965), near garden and AN1 air sampler location.</p> <p><b>TP1 (0.9 km WNW)</b> - Behind River Bend Station Activity Center at AP1 air sampler location.</p> <p><b>TQ1 (0.6 km NW)</b> - Across from MA-1 on RBS North Access Road.</p> <p><b>TR1 (0.8 km NNW)</b> - River Bend Station North Access Road across from Main Plant entrance.</p>	Quarterly	mR exposure quarterly.
	<p><b><u>TLDs</u></b> The balance of the stations (8) to be placed in special interest areas such as population centers, nearby residences, schools, and in 1 or 2 areas to serve as control locations.</p>	<p><b>TAC (15.8 km N)</b> - Utility pole at Jct. of US Hwy. 61 and LA Hwy. 421, 7.9 km north of Bains. (Control)</p> <p><b>TCS (12.3 km NE)</b> - Utility pole at gate to East Louisiana State Hospital in Jackson. (Special)</p> <p><b>TEC (16.0 km E)</b> - Stub pole at jct. of Hwy. 955 and Greenbrier Road, 4.8 km North of Jct. of Hwys 955 and 964. (Control)</p>		

**Table 1.1**

**Radiological Environmental Sampling Program**

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	<p><b>TLDs</b> The balance of the stations (8) to be placed in special interest areas such as population centers, nearby residences, schools, and in 1 or 2 areas to serve as control locations.</p>	<p><b>TGS (17.0 km SE)</b> – Entergy Service Center compound in Zachary. (Special)</p> <p><b>TNS (6.0 km W)</b> – Utility pole with electrical meter at west bank ferry landing (LA Hwy. 10). (Special)</p> <p><b>TQS1 (4.0 km NW)</b> – Utility pole front of Pentecostal church (opposite West Feliciana Parish Hospital) near Jct. US Hwy. 61 and Commerce Street. (Special)</p> <p><b>TQS2 (5.8 km NW)</b> – St. Francis Substation on business US Hwy. 61 in St. Francisville. (Special)</p> <p><b>TRS (9.2 km NNW)</b> - Stub pole at Jct. of US Hwy. 61 and WF2 near Bains (West Feliciana High School). (Special)</p>	Quarterly	mR exposure quarterly.
Waterborne	<p><b>Surface Water</b> 1 sample upstream and 1 sample downstream.</p>	<p><b>SWU (5.0 km W)</b> - Mississippi River about 4 km upstream from the plant liquid discharge outfall, near LA Hwy. 10 ferry crossing.</p> <p><b>SWD (7.75 km S)</b> - Mississippi River about 4 km downstream from plant liquid discharge outfall, near paper mill.</p>	Grab samples quarterly	Gamma isotopic analysis, and tritium analysis quarterly.

Table 1.1

Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Waterborne	<p><b>Groundwater</b> Samples from 1 or 2 sources only if likely to be affected.</p>	<p><b>WU (~470 m NNE)</b> - Upland Terrace Aquifer well upgradient from plant. <b>WD (~470 m SW)</b> - Upland Terrace Aquifer well downgradient from plant.</p>	Semiannually	Gamma isotopic and tritium analysis semiannually.
	<p><b>Sediment From Shoreline</b> 1 sample from downstream area with existing or potential recreational value.</p>	<p><b>SEDD (7.75 km S)</b> - Mississippi River about 4 km downstream from plant liquid discharge outfall, near paper mill.</p>	Annually	Gamma isotopic analysis annually.
Ingestion	<p><b>Milk</b> If commercially available, 1 sample from milking animals within 8 km distant where doses are calculated to be greater than 1 mrem per year.  1 sample from milking animals at a control location 15 - 30 km distant when an indicator location exists.</p>	Currently, no available milking animals within 8 km of RBS.	Quarterly when animals are on pasture.	Gamma isotopic and I-131 analysis quarterly when animals are on pasture.
	<p><b>Fish and Invertebrates</b> 1 sample of a commercially and/or recreationally important species in vicinity of plant discharge area.  1 sample of similar species in area not influenced by plant discharge.</p>	<p><b>FD (7.75 km S)</b> - One sample of a commercially and/or recreationally important species from downstream area influenced by plant discharge.  <b>FU (4.0 km WSW)</b> - One sample of a commercially and/or recreationally important species from upstream area not influenced by plant discharge.</p>	Annually	Gamma isotopic analysis on edible portions annually

**Table 1.1**

**Radiological Environmental Sampling Program**

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Ingestion	<p><b>Food Products</b>                      1 sample of one type of broadleaf vegetation grown near the SITE BOUNDARY location of highest predicted annual average ground level D/Q if milk sampling is not performed.</p> <p>1 sample of similar broadleaf vegetation grown 15 – 30 km distant, if milk sampling is not performed.</p>	<p><b>GN1 (0.9 km W)</b> – Sampling will be performed in accordance with Table 3.12.1-1 Section 4.a of the Technical Requirements Manual.</p> <p><b>GQC (32.0 km NW)</b> - One sample of similar vegetables from LA State Penitentiary at Angola. (Control)</p>	Quarterly during the growing season.	Gamma isotopic and I-131 analysis quarterly.

Figure 1-1  
Exposure Pathways

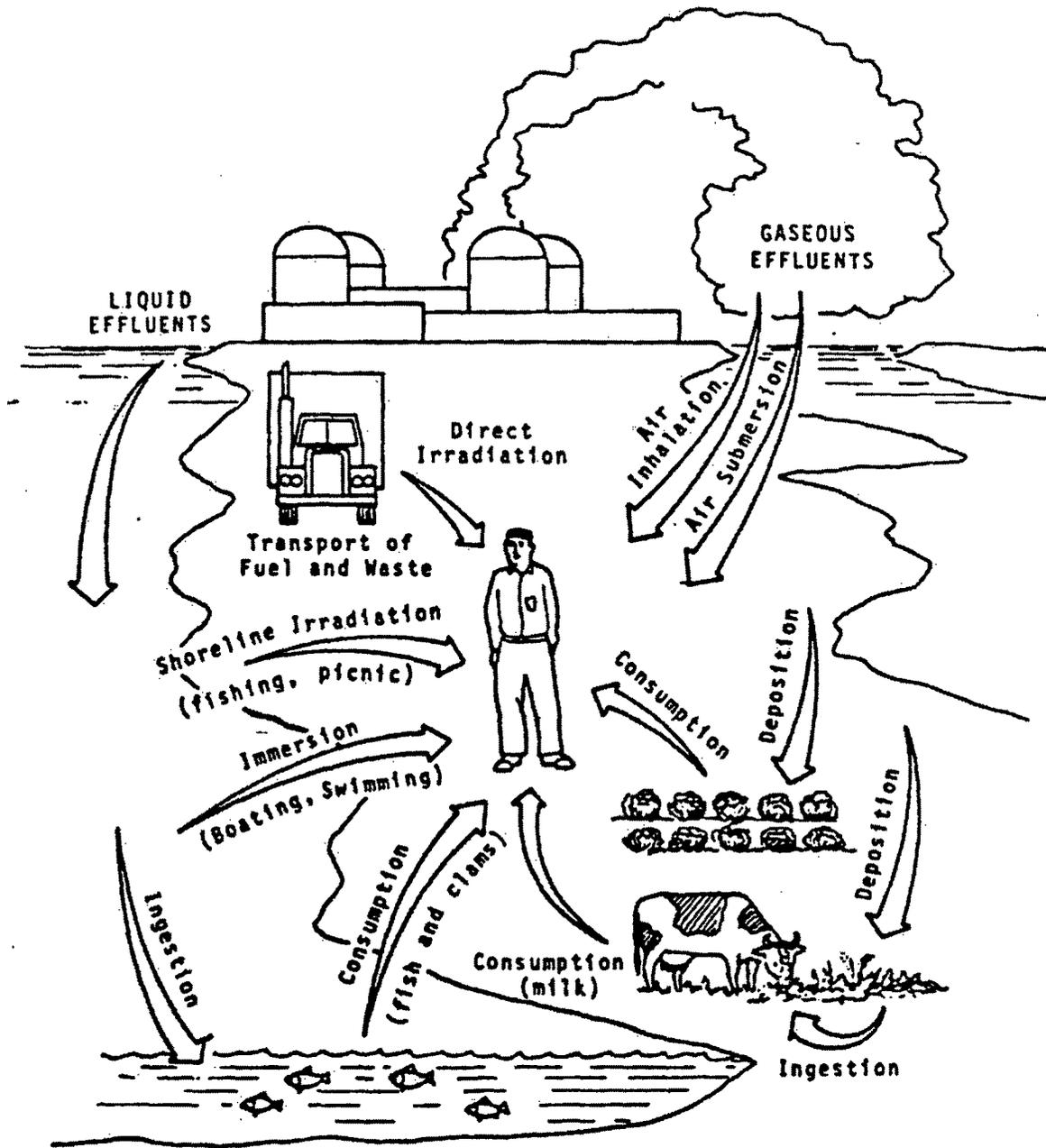


Figure 1-2  
Sample Collection Sites – Near Field

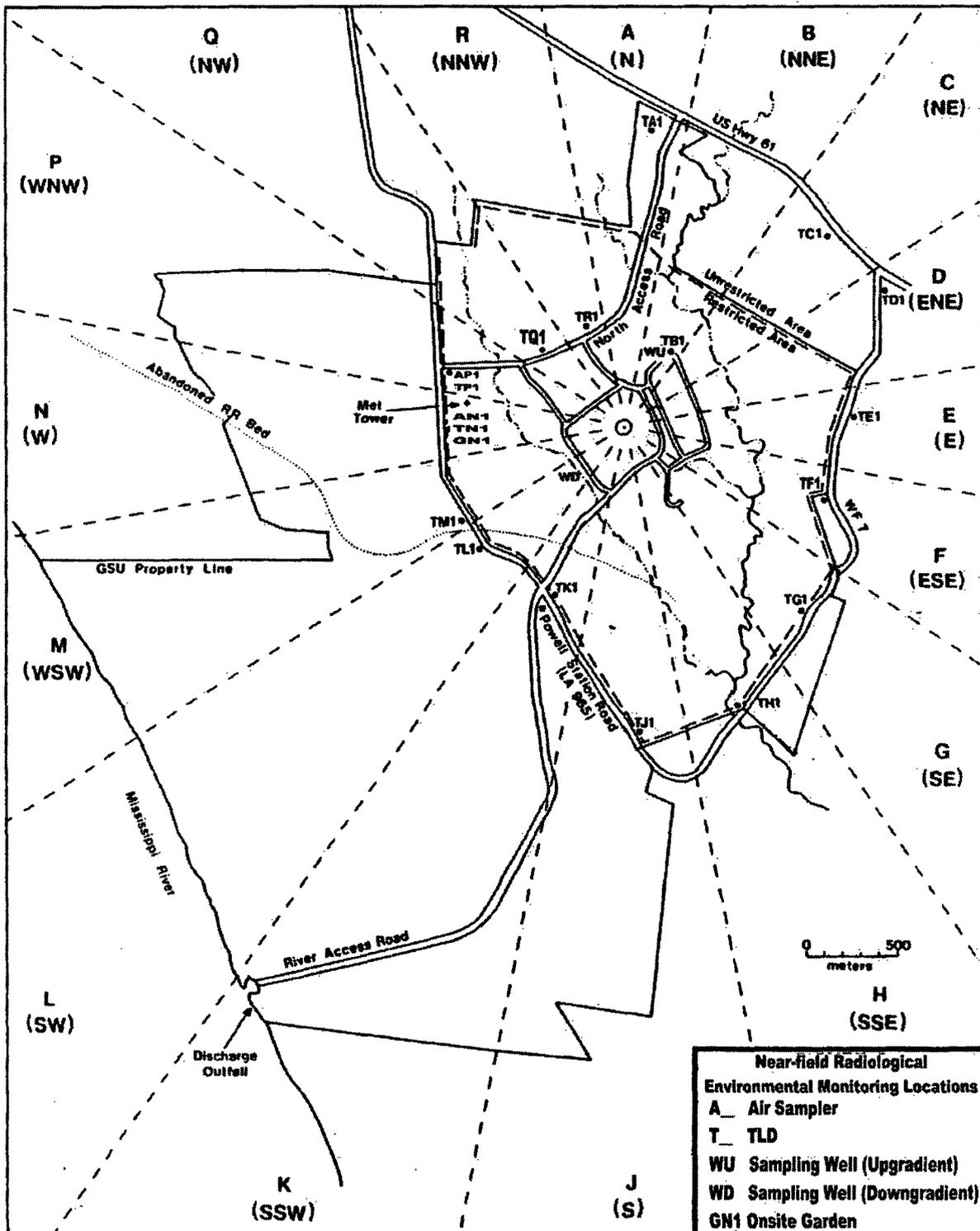
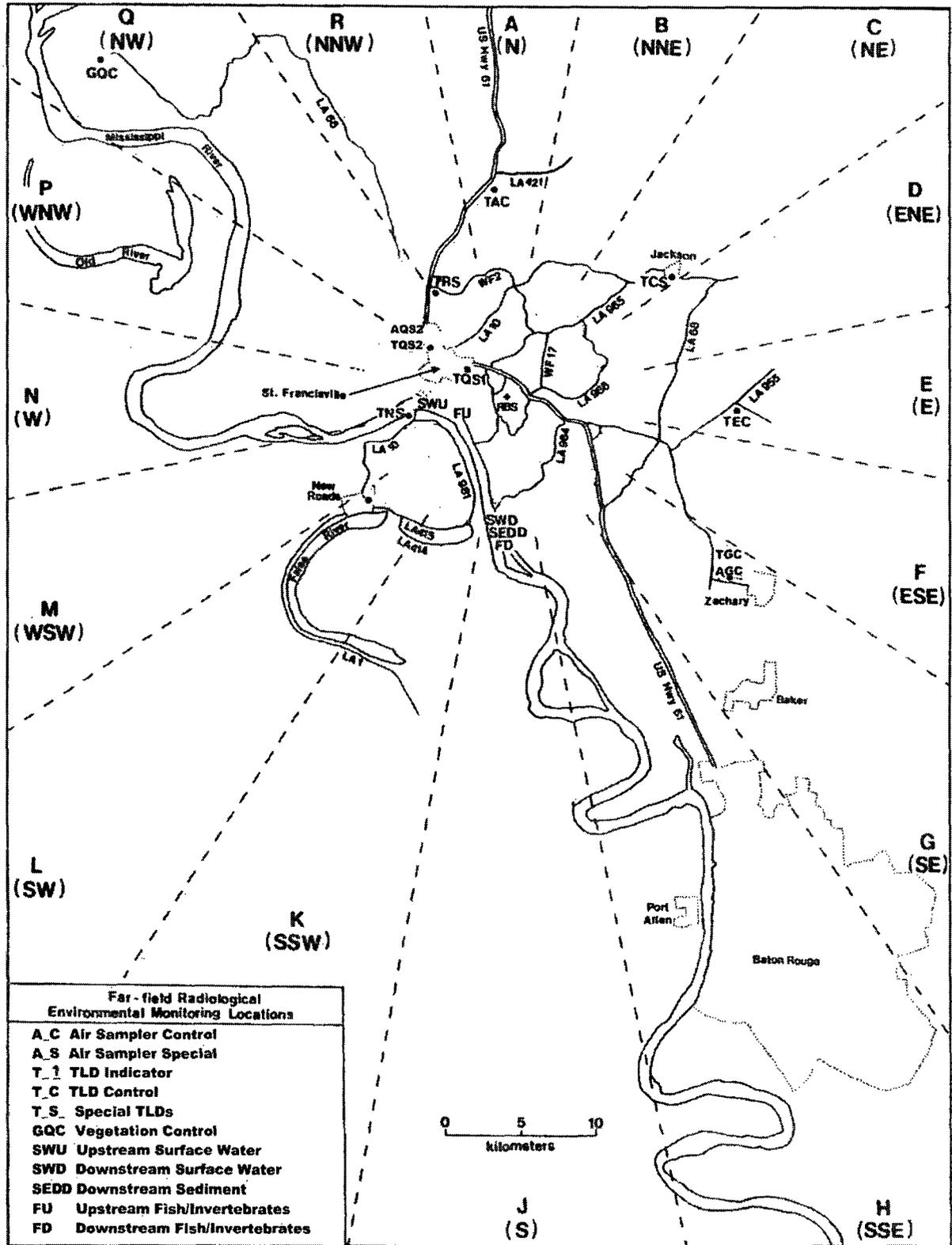


Figure 1-3  
Sample Collection Sites – Far Field



## 2. Interpretation and Trends of Results

### 2.1. Air Particulate and Radioiodine Sample Results

Iodine-131 was not detected in the radioiodine cartridges during 2010 as has been the case in previous years. Indicator gross beta air particulate results for 2010 were similar to preoperational and operational levels as seen below. Results are reported as annual average pCi/m<sup>3</sup> (picocuries per cubic meter).

<u>Monitoring Period</u>	<u>Result</u>
Preoperational	0.030
2010	0.024
2009	0.023
2008	0.023
2007	0.024
2006	0.024

Table 3.1 provides a comparison of the indicator and control location mean values which further emphasizes that the airborne pathway continues to remain at background levels. Figure 2-2 also shows a comparison of indicator results for 2010 versus control location data from 1986 to 2009. Sixteen indicator results for 2010 were out of the three-sigma levels. A review of the gross beta counter quality control data indicated no anomalies that would account for these readings. River Bend results for the last five years and the 2010 results from three other nuclear facilities were reviewed. The data was comparable to the 2010 River Bend results and indicated that the results that were above the three-sigma level are due to seasonal meteorological conditions.

### 2.2. Thermoluminescent Dosimetry Sample Results

Gamma radiation exposure in the reporting period compares to previous years. Figure 2-1 compares quarterly indicator results for 2010 with control location data from 1986 to 2009. All indicator results were within three-sigma of the control data.

RBS normalizes measured exposure to 90 days and relies on comparison of the indicator locations to the control as a measure of plant impact. RBS's comparison of the indicator and special interest area TLD results to the controls, as seen in Table 3.1, indicates that the ambient radiation levels are unaffected by plant operations. Therefore, levels continue to remain at or near background.

The results of one control TLD from the third quarter 2010 from location TEC was unavailable due to the result of that TLD not being available.

### 2.3. Water Sample Results

Analytical results for 2010 surface water and groundwater samples were similar to those reported in previous years.

**Surface water** samples were collected from two locations (indicator and control) and analyzed for gamma radionuclides and tritium. Gamma radionuclides were below detectable limits at the indicator and control locations. Tritium was also below detectable limits at all locations. Listed below is a comparison of 2010 results from the indicator location as compared to the preoperational and previous operational years. Results are reported as annual average pCi/l (picocuries per liter).

<u>Radionuclide</u>	<u>2010</u>	<u>2003 – 2009</u>	<u>Preoperational</u>
Gammas	<LLD	<LLD	<LLD
Tritium	<LLD	<LLD	<LLD

**Groundwater** samples were collected from two locations (indicator and control) and analyzed for gamma radionuclides and tritium. Gamma radionuclides and Tritium were below detectable limits at the indicator and control locations. Listed below is a comparison of 2010 results from the indicator location as compared to the preoperational and previous operational years. Results are reported as annual average pCi/l.

<u>Radionuclide</u>	<u>2010</u>	<u>2003 – 2009</u>	<u>Preoperational</u>
Gammas	<LLD	<LLD	<LLD
Tritium	<LLD	<LLD	<LLD

Based on these comparisons, the operation of RBS had no impact on this pathway during 2010, and levels of radionuclides monitored for this pathway continue to remain similar to those obtained in operational and preoperational years.

### 2.4. Shoreline Sediment Sample Results

A shoreline sediment sample was collected from the indicator location in 2010 and analyzed for gamma radionuclides. RBS also samples a non-REMP upstream control sediment sample. A review of historical indicator and upstream sediment samples periodically shows Cs-137. No Cs-137 was indicated on the samples in 2010. Therefore, based on these measurements, RBS operations had no significant radiological impact upon the environment or public via this pathway.

### 2.5. Milk Sample Results

Milk samples were not collected during 2010 due to the unavailability of indicator locations within 5 miles (8 km) of RBS. Since there are no dairies within five miles of the RBS site, it is concluded RBS's operation had no impact on this pathway in 2010.

## **2.6. Fish and Invertebrate Sample Results**

Fish samples were collected from two locations (indicator and control) and analyzed for gamma radionuclides. In 2010, gamma radionuclides were below detectable limits which is consistent with the preoperational and operational monitoring periods. Therefore, based on these measurements, RBS operations had no significant radiological impact upon the environment or public by this pathway.

## **2.7. Food Product Sample Results**

Food product samples were collected when available from two locations (indicator and control) in 2010 and analyzed for gamma radionuclides in accordance with Table TRM 3.12.1-1. The 2010 levels remained undetectable which is consistent with previous operational years. Therefore, since levels continue to remain at background, it can be concluded that plant operations is not impacting this pathway.

## **2.8. Land Use Census Results**

The Land Use Census for 2010 was conducted in accordance with procedure ESP-8-051, as required by Technical Requirements Manual (TRM) (TR 3.12.2).

A garden census is not conducted pursuant to the note in the TRM (TLCO 3.12.2) that allows the sampling of broadleaf vegetation in the highest calculated average ground-level D/Q sector near site boundary in lieu of the garden census.

The milk animal census identified no milk animals within 8 km (5 miles) of River Bend site. This information was verified by the County Agents from West Feliciana, East Feliciana, and Pointe Coupee parishes.

The resident census changes are noted in Table 2.1. One resident was added to account of the Point Coupee Parish Detention Center. See the comments in Table 2.1 for specific information regarding changes.

No locations were identified in 2010 that would yield a calculated dose or dose commitment greater than those contained in the TRM (TR 3.11).

Table 2.1 contains data from the most recently completed Land Use Census.

## **2.9. Interlaboratory Comparison Results**

RBS' Environmental Laboratory analyzed interlaboratory comparison samples to fulfill the requirements of Technical Requirements Manual 3.12.3. Attachment 8.1 contains these results. The interlaboratory comparison results indicated that 100% of the sample results for accuracy and precision were within the acceptable control limits.

**Table 2-1**  
**Land Use Census Results**  
**2010**

Item #	Sector	Nearest Residence	Range (km)	Nearest Milk Animal	Range (km)	Comment #
1	A (N)	5498 Hwy 61 St.Francisville, LA 70775	1.9	-	-	
2	B (NNE)	4549 Old Hwy 61 St.Francisville, LA 70775	1.4	-	-	
3	C (NE)	4553 Old Hwy 61 St.Francisville, LA 70775	1.5	-	-	
4	D (ENE)	12657 Powell Station Rd. St.Francisville, LA 70775	1.4	-	-	
5	E (E)	4635 Hwy 61 St.Francisville, LA 70775	2.6	-	-	
6	F (ESE)	12019 Fairview Way Jackson, LA 7748	2.6	-	-	
7	G (SE)	3319 Hwy 964 Jackson, LA 70748	3.7	-	-	
8	H (SSE)	11813 Powell Station Rd. St.Francisville, LA 70775	1.7	-	-	
9	J (S)	11649 Powell Station Rd. St.Francisville, LA 70775	1.9	-	-	
10	K (SSW)	8909 Hwy 981 New Roads, LA 70760	6.5	-	-	
11	L (SW)			-	-	<b>1</b>
12	M (WSW)	10933 Cajun 2 Rd. New Roads, LA 70760	5.1	-	-	<b>2</b>
13	N (W)			-	-	<b>1</b>
14	P (WNW)	10426 Old Field Rd. St.Francisville, LA 70775	3.7	-	-	
15	Q (NW)	9537 Hwy 965 St.Francisville, LA 70775	1.3	-	-	
16	R (NNW)	9794 Hwy 965 St.Francisville, LA 70775	1.6	-	-	

#	Comment
<b>1</b>	No residence located within 8 km.
<b>2</b>	New residence added for Pointe Coupee Parish Detention Center.

FIGURE 2-1  
TLD Indicator Results (2010) Versus Control Data (1986-2009)

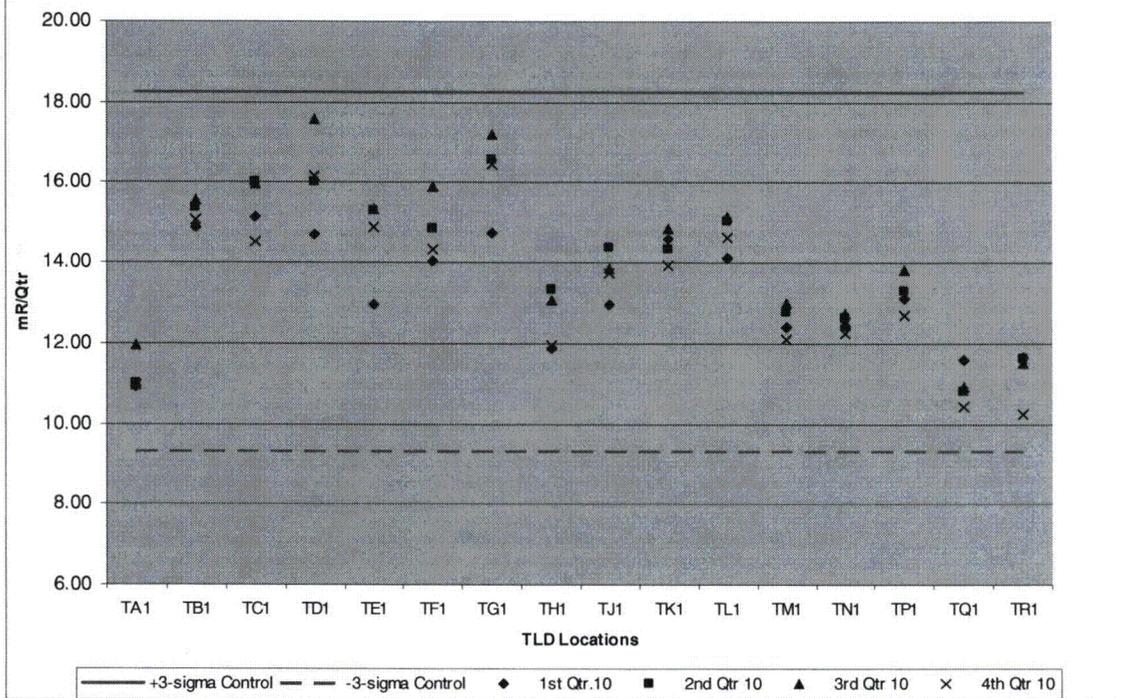
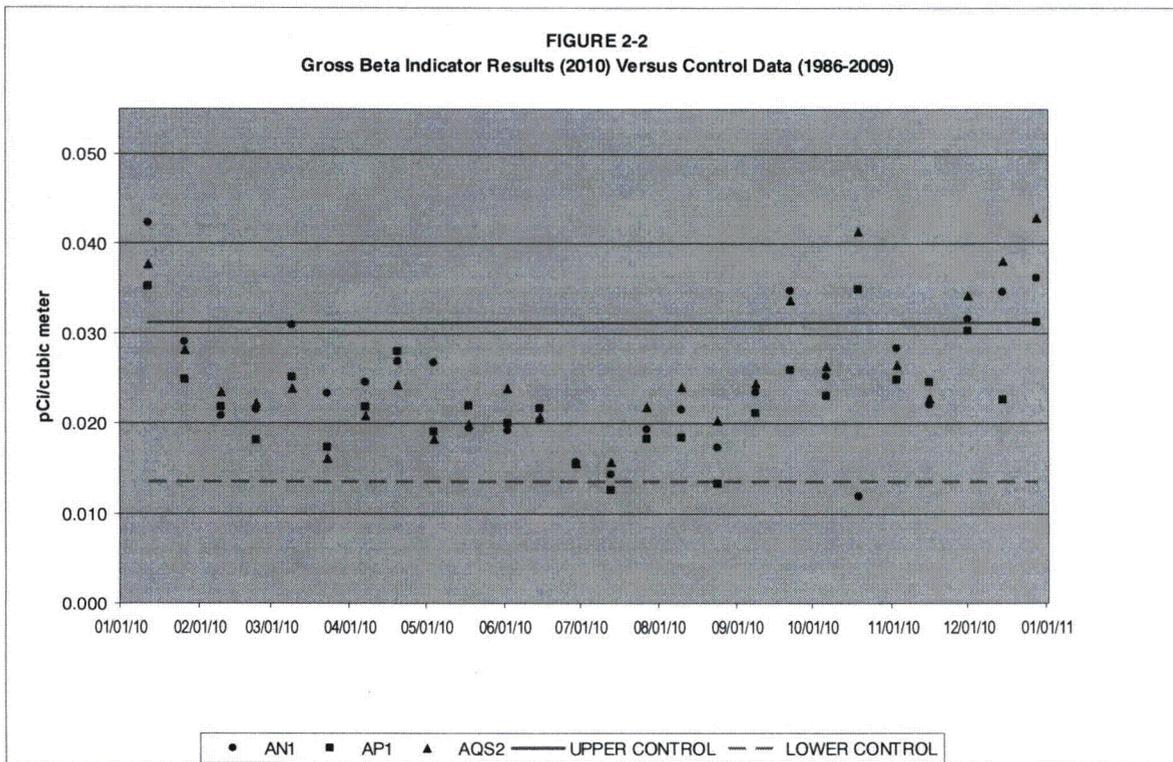


FIGURE 2-2  
Gross Beta Indicator Results (2010) Versus Control Data (1986-2009)



### **3. Radiological Environmental Monitoring Program Summary**

#### **3.1. 2010 Program Results Summary**

Table 3.1 summarizes the 2010 REMP results. RBS personnel did not use values reported as less than the lower limit of detection (<LLD) when determining ranges and means for indicator and control locations.

Table 3.1

**Radiological Environmental Monitoring Program Summary**Name of Facility: River Bend StationDocket No: 50-458Location of Facility: West Feliciana Parish, LouisianaReporting Period: January - December 2010

Sample Type (Units)	Type & Number of Analyses	LLD <sup>a</sup>	Indicator Locations Mean (F) <sup>b</sup> [ Range ]	Location with Highest Annual Mean		Control Locations Mean (F) <sup>b</sup> [ Range ]	Number of Nonroutine Results <sup>d</sup>
				Location <sup>c</sup>	Mean (F) <sup>b</sup> [ Range ]		
Air Particulates (pCi/m <sup>3</sup> )	Gross Beta 104	0.01	0.024 ( 78 / 78 ) [ 0.012 - 0.043 ]	AQS2 ( 5.8 km NW )	0.026 ( 26 / 26 ) [ 0.012 - 0.043 ]	0.026 ( 26 / 26 ) [ 0.016 - 0.050 ]	0
Airborne Iodine (pCi/m <sup>3</sup> )	I-131 104	0.07	<LLD	N/A	N/A	<LLD	0
Indicators TLDs (mR/Qtr)	Gamma 64	(e)	13.73 ( 64 / 64 ) [ 10.25 - 17.60 ]	TGI (1.6 km SE)	16.24 ( 4 / 4 ) [ 14.74 - 17.19 ]	N/A	0
Special Interest TLDs (mR/Qtr)	Gamma 24	(e)	14.88 ( 24 / 24 ) [ 12.74 - 16.78 ]	TQS1 ( 4.0 km NW )	16.38 ( 4 / 4 ) [ 15.70 - 16.78 ]	N/A	0
Control TLDs (mR/Qtr)	Gamma 7	(e)	N/A	N/A	N/A	15.59 ( 7 / 8 ) [ 14.27 - 17.42 ]	0

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: River Bend Station

Docket No: 50-458

Location of Facility: West Feliciana Parish, Louisiana

Reporting Period: January - December 2010

Sample Type (Units)	Type & Number of Analyses	LLD <sup>a</sup>	Indicator Location Mean ( F ) <sup>b</sup> [ Range ]	Location with Highest Annual Mean		Control Locations Mean ( F ) <sup>b</sup> [ Range ]	Number of Nonroutine Results <sup>d</sup>
				Location <sup>c</sup>	Mean ( F ) <sup>b</sup> [ Range ]		
Surface Water ( pCi/L )	H-3 10	3000	<LLD	N/A	N/A	<LLD	0
	Gamma 10						
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<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
	I-131	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 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: River Bend Station

Docket No: 50-458

Location of Facility: West Feliciana Parish, Louisiana

Reporting Period: January - December 2010

Sample Type (Units)	Type & Number of Analyses <sup>a</sup>	LLD <sup>a</sup>	Indicator Locations Mean (F) <sup>b</sup> [ Range ]	Location with Highest Annual Mean		Control Locations Mean (F) <sup>b</sup> [ Range ]	Number of Nonroutine Results <sup>d</sup>
				Location <sup>c</sup>	Mean (F) <sup>b</sup> [ Range ]		
Groundwater (pCi/L)	H-3 6	3000	<LLD	N/A	N/A	<LLD	0
	Gamma 6						
	Mn-54 15	15	<LLD	N/A	N/A	<LLD	0
	Co-58 15	15	<LLD	N/A	N/A	<LLD	0
	Fe-59 30	30	<LLD	N/A	N/A	<LLD	0
	Co-60 15	15	<LLD	N/A	N/A	<LLD	0
	Zn-65 30	30	<LLD	N/A	N/A	<LLD	0
	Zr-95 30	30	<LLD	N/A	N/A	<LLD	0
	Nb-95 15	15	<LLD	N/A	N/A	<LLD	0
	I-131 15	15	<LLD	N/A	N/A	<LLD	0
	Cs-134 15	15	<LLD	N/A	N/A	<LLD	0
	Cs-137 18	18	<LLD	N/A	N/A	<LLD	0
	Ba-140 60	60	<LLD	N/A	N/A	<LLD	0
La-140 15	15	<LLD	N/A	N/A	<LLD	0	
Shoreline Sediment (pCi/kg) <sup>f</sup>	Gamma 2						
	Cs-134 150	150	<LLD	N/A	N/A	<LLD	0
	Cs-137 180	180	<LLD	N/A	N/A	<LLD	0

TABLE 3.1

Radiological Environmental Monitoring Program SummaryName of Facility: River Bend StationDocket No: 50-458Location of Facility: West Feliciana Parish, LouisianaReporting Period: January - December 2010

Sample Type (Units)	Type & Number of Analyses	LLD <sup>a</sup>	Indicator Location Mean ( F ) <sup>b</sup> [ Range ]	Location with Highest Annual Mean		Control Locations Mean ( F ) <sup>b</sup> [ Range ]	Number of Nonroutine Results <sup>d</sup>
				Location <sup>c</sup>	Mean ( F ) <sup>b</sup> [ Range ]		
Fish ( pCi/kg )	Gamma 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	<LLD	N/A	N/A	<LLD	0
Food Products ( pCi/kg )	I-131 8	60	<LLD	N/A	N/A	<LLD	0
	Gamma 8						
	Cs-134	60	<LLD	N/A	N/A	<LLD	0
	Cs-137	80	<LLD	N/A	N/A	<LLD	0

a LLD = Required lower limit of detection based on RBS Technical Requirements Manual Table 3.12.1-3.

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

c Locations are specified (1) by name and (2) direction and distance relative to reactor site.

d 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.

e LLD is not defined in RBS Technical Requirements Manual Table 3.12.1-3.

f Control location for sediment is upstream surface water sample.

**2010 Radiological Monitoring Report**  
**Summary of Monitoring Results**

**Attachment 1.1**

Sample Type: **Air Particulate and Charcoal Cartridge – Indicator Location AN1**  
 Analysis: Gross Beta and Iodine  
 Units: pCi/m<sup>3</sup>

<b>LLD (pCi/m<sup>3</sup>)</b>			<b>0.07</b>	<b>0.01</b>
<b>LAB ID</b>	<b>START DATE</b>	<b>END DATE</b>	<b>I-131</b>	<b>GROSS BETA</b>
20100011	12/29/2010	1/12/2010	< 0.008	0.042 +/- 0.0008
20100047	1/12/2010	1/26/2010	< 0.007	0.029 +/- 0.0006
20100087	1/26/2010	2/9/2010	< 0.007	0.021 +/- 0.0005
20100118	2/9/2010	2/23/2010	< 0.007	0.022 +/- 0.0005
20100244	2/23/2010	3/9/2010	< 0.008	0.031 +/- 0.0006
20100328	3/9/2010	3/23/2010	< 0.046	0.023 +/- 0.0012
20100383	3/25/2010	4/7/2010	< 0.010	0.025 +/- 0.0004
20100429	4/7/2010	4/20/2010	< 0.009	0.027 +/- 0.0005
20100465	4/20/2010	5/4/2010	< 0.007	0.027 +/- 0.0005
20100543	5/4/2010	5/18/2010	< 0.007	0.020 +/- 0.0004
20100650	5/18/2010	6/2/2010	< 0.007	0.019 +/- 0.0005
20100728	6/2/2010	6/15/2010	< 0.007	0.020 +/- 0.0005
20100825	6/15/2010	6/29/2010	< 0.009	0.016 +/- 0.0005
20100872	6/29/2010	7/13/2010	< 0.007	0.014 +/- 0.0004
20100916	7/13/2010	7/27/2010	< 0.007	0.019 +/- 0.0005
20100966	7/27/2010	8/10/2010	< 0.008	0.022 +/- 0.0006
20101090	8/10/2010	8/24/2010	< 0.008	0.017 +/- 0.0005
20101171	8/24/2010	9/8/2010	< 0.007	0.024 +/- 0.0005
20101222	9/8/2010	9/22/2010	< 0.009	0.035 +/- 0.0007
20101277	9/22/2010	10/6/2010	< 0.007	0.025 +/- 0.0006
20101313	10/6/2010	10/19/2010	< 0.008	0.012 +/- 0.0004
20101410	10/19/2010	11/3/2010	< 0.006	0.028 +/- 0.0006
20101460	11/3/2010	11/16/2010	< 0.008	0.022 +/- 0.0005
20101534	11/16/2010	12/1/2010	< 0.005	0.032 +/- 0.0006
20101598	12/1/2010	12/15/2010	< 0.008	0.035 +/- 0.0007
20101616	12/15/2010	12/28/2010	< 0.008	0.036 +/- 0.0007

**Totals:**

**Average:** 0.025  
**Maximum:** 0.042  
**Minimum:** 0.012

**Attachment 1.2**

Sample Type: **Air Particulate and Charcoal Cartridge – Indicator Location API**  
 Analysis: Gross Beta and Iodine  
 Units: pCi/m<sup>3</sup>

<b>LLD (pCi/m<sup>3</sup>) LAB ID</b>	<b>START DATE</b>	<b>END DATE</b>	<b>0.07 I-131</b>	<b>0.01 GROSS BETA</b>
20100010	12/29/2010	1/12/2010	< 0.009	0.035 +/- 0.0007
20100046	1/12/2010	1/26/2010	< 0.007	0.025 +/- 0.0006
20100086	1/26/2010	2/9/2010	< 0.007	0.022 +/- 0.0005
20100117	2/9/2010	2/23/2010	< 0.009	0.018 +/- 0.0005
20100243	2/23/2010	3/9/2010	< 0.008	0.025 +/- 0.0006
20100327	3/9/2010	3/23/2010	< 0.007	0.017 +/- 0.0004
20100382	3/23/2010	4/7/2010	< 0.009	0.022 +/- 0.0004
20100428	4/7/2010	4/20/2010	< 0.010	0.028 +/- 0.0005
20100464	4/20/2010	5/4/2010	< 0.008	0.019 +/- 0.0004
20100542	5/4/2010	5/18/2010	< 0.009	0.022 +/- 0.0004
20100649	5/18/2010	6/2/2010	< 0.010	0.020 +/- 0.0005
20100727	6/2/2010	6/15/2010	< 0.008	0.022 +/- 0.0006
20100824	6/15/2010	6/29/2010	< 0.007	0.015 +/- 0.0005
20100871	6/29/2010	7/13/2010	< 0.008	0.013 +/- 0.0004
20100915	7/13/2010	7/27/2010	< 0.007	0.018 +/- 0.0005
20100965	7/27/2010	8/10/2010	< 0.007	0.018 +/- 0.0005
20101089	8/10/2010	8/24/2010	< 0.008	0.013 +/- 0.0004
20101170	8/24/2010	9/8/2010	< 0.011	0.021 +/-0.0005
20101221	9/8/2010	9/22/2010	< 0.009	0.026 +/-0.0006
20101276	9/22/2010	10/6/2010	< 0.008	0.023 +/-0.0005
20101312	10/6/2010	10/19/2010	< 0.009	0.035 +/-0.0007
20101409	10/19/2010	11/3/2010	< 0.010	0.025 +/-0.0005
20101459	11/3/2010	11/16/2010	< 0.008	0.025 +/- 0.0006
20101533	11/16/2010	12/1/2010	< 0.006	0.030 +/-0.0006
20101597	12/1/2010	12/15/2010	< 0.010	0.023 +/- 0.0005
20101615	12/15/2010	12/28/2010	< 0.010	0.031 +/- 0.0006

**Totals:**

**Average:** 0.023  
**Maximum:** 0.035  
**Minimum:** 0.013

**Attachment 1.3**

Sample Type: Air Particulate and Charcoal Cartridge – Indicator Location AOS2  
 Analysis: Gross Beta and Iodine  
 Units: pCi/m<sup>3</sup>

LLD (pCi/m <sup>3</sup> ) LAB ID	START DATE	END DATE	0.07 I-131	0.01 GROSS BETA
20100012	12/29/2010	1/12/2010	< 0.007	0.038 +/- 0.0007
20100048	1/12/2010	1/26/2010	< 0.006	0.028 +/- 0.0006
20100088	1/26/2010	2/9/2010	< 0.006	0.024 +/- 0.0005
20100119	2/9/2010	2/23/2010	< 0.006	0.022 +/- 0.0005
20100245	2/23/2010	3/9/2010	< 0.009	0.024 +/- 0.0005
20100329	3/9/2010	3/23/2010	< 0.006	0.016 +/- 0.0003
20100384	3/23/2010	4/7/2010	< 0.007	0.021 +/- 0.0004
20100430	4/7/2010	4/20/2010	< 0.007	0.024 +/- 0.0004
20100466	4/20/2010	5/4/2010	< 0.006	0.018 +/- 0.0004
20100544	5/4/2010	5/18/2010	< 0.007	0.020 +/- 0.0004
20100651	5/18/2010	6/2/2010	< 0.006	0.024 +/- 0.0005
20100729	6/2/2010	6/15/2010	< 0.009	0.021 +/- 0.0005
20100826	6/15/2010	6/29/2010	< 0.007	0.016 +/- 0.0005
20100873	6/29/2010	7/13/2010	< 0.005	0.016 +/- 0.0005
20100917	7/13/2010	7/27/2010	< 0.008	0.022 +/- 0.0005
20100967	7/27/2010	8/10/2010	< 0.007	0.024 +/- 0.0006
20101091	8/10/2010	8/24/2010	< 0.007	0.020 +/- 0.0005
20101172	8/24/2010	9/8/2010	< 0.006	0.024 +/- 0.0005
20101223	9/8/2010	9/22/2010	< 0.008	0.034 +/- 0.0006
20101278	9/22/2010	10/6/2010	< 0.007	0.026 +/- 0.0006
20101314	10/6/2010	10/19/2010	< 0.009	0.041 +/- 0.0008
20101411	10/19/2010	11/3/2010	< 0.009	0.027 +/- 0.0006
20101461	11/3/2010	11/16/2010	< 0.010	0.023 +/- 0.0006
20101535	11/16/2010	12/1/2010	< 0.009	0.034 +/- 0.0007
20101599	12/1/2010	12/15/2010	< 0.007	0.038 +/- 0.0007
20101617	12/15/2010	12/28/2010	< 0.010	0.043 +/- 0.0008

**Totals:**

**Average:** 0.026  
**Maximum:** 0.043  
**Minimum:** 0.016

**Attachment 1.4**

Sample Type: **Air Particulate and Charcoal Cartridge – Control Location AGC**  
 Analysis: Gross Beta and Iodine  
 Units: pCi/m<sup>3</sup>

<b>LLD (pCi/m<sup>3</sup>)</b>			<b>0.07</b>	<b>0.01</b>
<b>LAB ID</b>	<b>START DATE</b>	<b>END DATE</b>	<b>I-131</b>	<b>GROSS BETA</b>
20100013	12/29/2010	1/12/2010	< 0.007	0.030 +/- 0.0006
20100049	1/12/2010	1/26/2010	< 0.007	0.027 +/- 0.0006
20100089	1/26/2010	2/9/2010	< 0.007	0.020 +/- 0.0005
20100120	2/9/2010	2/23/2010	< 0.009	0.020 +/- 0.0005
20100246	2/23/2010	3/9/2010	< 0.008	0.025 +/- 0.0006
20100330	3/9/2010	3/23/2010	< 0.009	0.016 +/- 0.0003
20100385	3/23/2010	4/7/2010	< 0.007	0.019 +/- 0.0004
20100431	4/7/2010	4/20/2010	< 0.008	0.023 +/- 0.0004
20100467	4/20/2010	5/4/2010	< 0.010	0.026 +/- 0.0005
20100545	5/4/2010	5/18/2010	< 0.008	0.025 +/- 0.0004
20100652	5/18/2010	6/2/2010	< 0.009	0.019 +/- 0.0005
20100730	6/2/2010	6/15/2010	< 0.007	0.021 +/- 0.0006
20100827	6/15/2010	6/29/2010	< 0.008	0.016 +/- 0.0005
20100874	6/29/2010	7/13/2010	< 0.009	0.016 +/- 0.0005
20100918	7/13/2010	7/27/2010	< 0.008	0.020 +/- 0.0005
20100968	7/27/2010	8/10/2010	< 0.007	0.023 +/- 0.0006
20101092	8/10/2010	8/24/2010	< 0.010	0.019 +/- 0.0005
20101173	8/24/2010	9/8/2010	< 0.009	0.023 +/-0.0006
20101224	9/8/2010	9/22/2010	< 0.009	0.034 +/-0.0007
20101279	9/22/2010	10/6/2010	< 0.008	0.028 +/-0.0007
20101315	10/6/2010	10/19/2010	< 0.011	0.050 +/-0.0009
20101412	10/19/2010	11/3/2010	< 0.007	0.029 +/-0.0006
20101462	11/3/2010	11/16/2010	< 0.008	0.030 +/- 0.0007
20101536	11/16/2010	12/1/2010	< 0.007	0.037 +/-0.0007
20101600	12/1/2010	12/15/2010	< 0.012	0.039 +/- 0.0007
20101618	12/15/2010	12/28/2010	< 0.008	0.037 +/- 0.0008

**Totals:**

<b>Average:</b>	0.026
<b>Maximum:</b>	0.050
<b>Minimum:</b>	0.016

**Attachment 2.1**

Sample Type: Thermoluminescent Dosimeters (TLD)  
 Analysis: mR Exposure  
 Units: mR/Qtr

<u>INDICATORS</u>	<u>1ST QTR</u>	<u>2ND QTR</u>	<u>3RD QTR</u>	<u>4TH QTR</u>	<u>MEAN</u>
TA1	10.93	11.00	11.97	10.96	11.21
TB1	14.92	15.38	15.56	15.07	15.23
TC1	15.17	16.00	16.00	14.51	15.42
TD1	14.70	16.01	17.60	16.16	16.12
TE1	12.96	15.32	15.36	14.88	14.63
TF1	14.06	14.87	15.91	14.35	14.80
TG1	14.74	16.56	17.19	16.46	16.24
TH1	11.89	13.32	13.08	11.97	12.56
TJ1	12.96	14.38	13.86	13.73	13.73
TK1	14.59	14.33	14.87	13.94	14.43
TL1	14.12	15.04	15.16	14.65	14.74
TM1	12.39	12.77	13.01	12.09	12.57
TN1	12.44	12.64	12.72	12.26	12.51
TP1	13.11	13.28	13.82	12.71	13.23
TQ1	11.57	10.79	10.90	10.43	10.92
TR1	11.66	11.63	11.52	10.25	11.26
MAX	15.17	16.56	17.60	16.46	16.24
AVG	13.26	13.96	14.28	13.40	13.73
MIN	10.93	10.79	10.90	10.25	10.92

<u>SPECIAL INTEREST</u>	<u>1ST QTR</u>	<u>2ND QTR</u>	<u>3RD QTR</u>	<u>4TH QTR</u>	<u>MEAN</u>
TCS	13.41	12.96	13.84	12.74	13.24
TGS	16.57	16.05	15.64	16.18	16.11
TNS	13.71	13.83	14.30	13.55	13.85
TRS	15.64	15.29	16.67	16.41	16.00
TQS1	16.69	16.36	16.78	15.70	16.38
TQS2	13.36	13.99	13.72	13.73	13.70
MAX	16.69	16.36	16.78	16.41	16.38
AVG	14.89	14.75	15.16	14.72	14.88
MIN	13.36	12.96	13.72	12.74	13.24

<u>CONTROLS</u>	<u>1ST QTR</u>	<u>2ND QTR</u>	<u>3RD QTR</u>	<u>4TH QTR</u>	<u>MEAN</u>
TAC	16.46	16.19	17.42	15.91	16.49
TEC	14.27	15.06	NA	14.71	14.68
MAX	16.46	16.19	17.42	15.91	16.49
AVG	15.36	15.63	17.42	15.31	15.59
MIN	14.27	15.06	17.42	14.71	14.68

	<u>INDICATOR</u>	<u>CONTROL</u>	<u>SPECIAL</u>
MAX	17.60	17.42	16.78
AVG	13.73	15.93	14.88
MIN	10.25	14.27	12.74

**Attachment 3.1**

Sample Type: Surface Water  
 Analysis: Gamma Isotopic and Tritium  
 Units: pCi/l

LLD (pCi/l)			15	15	30	15	30	15	30	15	15	18	60	15
LAB ID	LOCATION	DATE	MN-54	CO-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	I-131	CS-134	CS-137	BA-140	LA-140
20100113	SWD	2/22/2010	< 5.12	< 3.50	< 9.13	< 4.48	< 7.76	< 4.10	< 8.58	< 5.71	< 5.11	< 4.98	< 17.14	< 6.07
20100114	SWD dup	2/22/2010	< 3.40	< 4.63	< 6.62	< 4.36	< 12.49	< 3.91	< 6.59	< 3.80	< 4.61	< 5.21	< 12.60	< 2.99
20100115	SWU	2/22/2010	< 4.48	< 4.98	< 8.16	< 2.81	< 9.18	< 5.32	< 8.48	< 4.02	< 5.21	< 3.96	< 17.87	< 6.70
20100116	SWU dup	2/22/2010	< 5.68	< 5.19	< 7.81	< 5.92	< 15.00	< 5.60	< 8.01	< 5.72	< 5.54	< 7.07	< 20.77	< 6.97
20100569	SWU	5/24/2010	< 5.32	< 5.60	< 6.07	< 5.18	< 9.85	< 6.12	< 8.68	< 4.13	< 4.51	< 6.09	< 17.51	< 4.95
20100570	SWD	5/24/2010	< 6.84	< 4.60	< 7.92	< 5.01	< 12.15	< 5.23	< 9.55	< 5.15	< 3.99	< 6.15	< 15.87	< 6.56
20100933	SWU	8/2/2010	< 5.29	< 4.38	< 8.79	< 6.16	< 10.98	< 7.19	< 10.56	< 6.35	< 5.67	< 5.54	< 16.79	< 6.99
20100934	SWD	8/2/2010	< 5.88	< 4.44	< 9.86	< 5.64	< 10.92	< 7.23	< 8.40	< 4.56	< 4.96	< 3.69	< 14.63	< 6.38
20101422	SWU	11/9/2010	< 5.86	< 5.66	< 13.93	< 6.20	< 11.88	< 6.63	< 11.79	< 6.37	< 6.25	< 6.96	< 20.27	< 8.17
20101423	SWD	11/9/2010	< 5.11	< 5.45	< 11.06	< 7.56	< 14.56	< 8.14	< 12.77	< 6.59	< 7.47	< 5.83	< 20.72	< 10.79

LLD (pCi/l)			3000
LAB ID	LOCATION	DATE	TRITIUM
20100113	SWD	2/22/2010	< 570.10
20100114	SWD dup	2/22/2010	< 570.49
20100115	SWU	2/22/2010	< 572.45
20100116	SWU dup	2/22/2010	< 566.43
20100569	SWU	5/24/2010	< 517.02
20100570	SWD	5/24/2010	< 514.98
20100933	SWU	8/2/2010	< 471.05
20100934	SWD	8/2/2010	< 467.19
20101422	SWU	11/9/2010	< 433.19
20101423	SWD	11/9/2010	< 431.40

**Attachment 4.1**

Sample Type: **Groundwater**  
 Analysis: **Gamma Isotopic and Tritium**  
 Units: **pCi/l**

LLD (pCi/l)		15	15	30	15	30	15	30	15	15	18	60	15	
LAB ID	LOCATION	DATE	MN-54	CO-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	I-131	CS-134	CS-137	BA-140	LA-140
20100134	GWD	2/24/2010	< 4.27	< 5.07	< 9.19	< 4.71	< 7.42	< 5.57	< 9.14	< 4.08	< 4.10	< 3.74	< 19.09	< 5.93
20100171	GWU	2/25/2010	< 8.61	< 10.59	< 17.91	< 9.07	< 19.38	< 14.10	< 19.29	< 11.17	< 7.80	< 12.47	< 34.83	< 11.11
20100479	GWD	5/11/2010	< 5.56	< 4.38	< 11.74	< 5.13	< 9.41	< 7.03	< 11.97	< 5.54	< 6.60	< 5.98	< 20.68	< 3.99
20100480	GWU	5/11/2010	< 6.87	< 6.25	< 13.94	< 7.46	< 18.47	< 9.25	< 9.62	< 6.64	< 7.84	< 7.19	< 26.14	< 9.80
20101543	GWU	12/7/2010	< 7.99	< 5.17	< 11.15	< 6.91	< 15.11	< 9.78	< 10.58	< 7.50	< 7.21	< 10.39	< 25.45	< 8.73
20101544	GWD	12/7/2010	< 5.96	< 5.09	< 10.83	< 4.06	< 13.24	< 7.77	< 10.57	< 6.02	< 7.64	< 6.11	< 19.94	< 7.42

LLD (pCi/l)	LAB ID	LOCATION	DATE	3000 TRITIUM
	20100134	GWD	2/24/2010	< 571
	20100171	GWU	2/25/2010	< 562
	20100479	GWD	5/11/2010	< 528
	20100480	GWU	5/11/2010	< 530
	20101543	GWU	12/7/2010	< 365
	20101544	GWD	12/7/2010	< 365

**Attachment 5.1**

Sample Type: Shoreline Sediment SEDD  
Analysis: Gamma Isotopic  
Units: pCi/kg, dry

<b>LLD (pCi/kg)</b>		<b>150</b>	<b>180</b>
<b>LAB ID</b>	<b>DATE</b>	<b>CS-134</b>	<b>CS-137</b>
20100936	8/2/2010	< 24.58	< 27.14

Sample Type: Shoreline Sediment SEDU  
Analysis: Gamma Isotopic  
Units: pCi/kg, dry

<b>LLD (pCi/kg)</b>		<b>150</b>	<b>180</b>
<b>LAB ID</b>	<b>DATE</b>	<b>CS-134</b>	<b>CS-137</b>
20100935	8/2/2010	< 21.95	< 25.96

**Attachment 6.1**

Sample Type: **Food Products**  
Analysis: Gamma Isotopic  
Units: pCi/kg, wet

LLD (pCi/kg, wet)			<b>60</b>	<b>60</b>	<b>80</b>
<b>LAB ID</b>	<b>LOCATION</b>	<b>DATE</b>	<b>I-131</b>	<b>CS-134</b>	<b>CS-137</b>
20100045	GN1	1/26/2010	< 49.59	< 56.51	< 64.74
20100230	GQC	3/8/2010	< 52.34	< 58.78	< 57.46
20100447	GN1	4/27/2010	< 52.69	< 59.69	< 54.73
20100706	GQC	6/10/2010	< 38.91	< 45.30	< 53.04
20100913	GN1	7/27/2010	< 56.64	< 50.09	< 65.13
20101188	GQC	8/14/2010	< 46.63	< 50.20	< 48.84
20101316	GN1	10/19/2010	< 56.17	< 57.79	< 43.84
20101619	GQC	12/28/2010	< 42.39	< 44.56	< 48.14

**Attachment 7.1**

Sample Type: **Fish**  
Analysis: Gamma Isotopic  
Units: pCi/kg, wet

LLD (pCi/kg)			130	130	260	130	260	130	150
LAB ID	LOCATION	DATE	MN-54	CO-58	FE-59	CO-60	ZN-65	CS-134	CS-137
20101350	FU	10/19/2010	< 15.62	< 15.23	< 29.95	< 21.41	< 42.15	< 13.81	< 13.91
20101351	FD GOO	10/21/2010	< 36.85	< 23.38	< 61.75	< 37.85	< 84.33	< 26.15	< 29.32
20101352	FD Catfish	10/21/2010	< 24.29	< 28.09	< 65.56	< 33.31	< 78.02	< 26.88	< 28.62
20101353	FD Buffalo	10/21/2010	< 16.38	< 27.43	< 67.79	< 33.40	< 63.97	< 24.21	< 25.99

Attachment 8.1

Sample Type: Interlaboratory Comparison

Analysis: Gross Beta, Iodine-131, Tritium, and Gamma Isotopic

Calendar Year: 2010

1st Quarter dated March 18, 2010

Analytics E7024-125		Gamma in Water				Range of 0.80 to 1.25	
Nuclide	RBS Mean pCi/L	RBS 1-s pCi/L	Ref Lab Value pCi/L	Ref Lab Uncertainty pCi/L	Resolution	RBS/Ref Lab Ratio	Pass/Fail
I-131	74.9	5.30	72.2	1.21	59.7	1.04	Pass
Ce-141	268	7.10	263	4.40	59.8	1.02	Pass
Cr-51	418	1.66	364	6.08	59.9	1.15	Pass
Cs-134	182	4.80	179	2.99	59.9	1.02	Pass
Cs-137	168	5.20	159	2.66	59.8	1.06	Pass
Co-58	145	6.30	144	2.40	60.0	1.01	Pass
Mn-54	222	5.60	209	3.49	59.9	1.06	Pass
Fe-59	151	8.70	138	2.31	59.7	1.09	Pass
Zn-65	266	9.80	256	4.27	60.0	1.04	Pass
Co-60	185	4.60	185	3.08	60.1	1.00	Pass

Analytics E7025-125		Gross Beta in Water				Range of 0.80 to 1.25	
Nuclide	RBS Mean pCi/L	RBS 1-s pCi/L	Ref Lab Value pCi/L	Ref Lab uncertainty pCi/L	Resolution	RBS/Ref Lab Ratio	Pass/Fail
Cs-137	270	9.90	260	4.35	59.8	1.04	Pass

Analytics E7026-125		I-131 cartridge				Range of 0.80 to 1.25	
Nuclide	RBS Mean pCi/each	RBS 1-s pCi/each	Ref Lab Value pCi/each	Ref Lab uncertainty pCi/each	Resolution	RBS/Ref Lab Ratio	Pass/Fail
I-131	84.5	3.70	85.6	1.43	59.9	0.99	Pass

Analytics E7027-125		Gamma in Milk				Range of 0.80 to 1.25	
Nuclide	RBS Mean pCi/L	RBS 1-s pCi/L	Ref Lab Value pCi/L	Ref Lab uncertainty pCi/L	Resolution	RBS/Ref Lab Ratio	Pass/Fail
I-131	75.7	2.80	74.0	1.24	59.7	1.02	Pass
Ce-141	257	5.20	261	4.36	59.9	0.98	Pass
Cr-51	364	17.7	361	6.03	59.9	1.01	Pass
Cs-134	176	1.40	178	2.97	59.9	0.99	Pass
Cs-137	163	6.00	158	2.64	59.8	1.03	Pass
Co-58	142	1.00	143	2.38	60.1	0.99	Pass
Mn-54	209	9.20	207	3.46	59.8	1.01	Pass
Fe-59	154	0.80	137	2.29	59.8	1.12	Pass
Zn-65	256	9.40	254	4.24	59.9	1.01	Pass
Co-60	176	10.2	183	3.06	59.8	0.96	Pass

Attachment 8.1

Sample Type: **Interlaboratory Comparison**

Analysis: Gross Beta, Iodine-131, Tritium, and Gamma Isotopic

Calendar Year: 2010

\*2<sup>nd</sup> quarter dated June 17, 2010

\*\*3<sup>rd</sup> Quarter dated Sept. 16, 2010

Analytics E7111-125 *		Gross Beta filter				Range of 0.80 to 1.25	
Nuclide	RBS Mean pCi/filter	RBS 1-s pCi/filter	Ref Lab Value pCi/filter	Ref Lab uncertainty pCi/filter	Resolution	RBS/Ref Lab Ratio	Pass/Fail
Cs-137	60.5	0.33	54.0	0.902	59.9	1.12	Pass

Analytics E7255-125 **		H-3 in water				Range of 0.80 to 1.25	
Nuclide	RBS Mean pCi/L	RBS 1-s pCi/L	Ref Lab Value pCi/L	Ref Lab uncertainty pCi/L	Resolution	RBS/Ref Lab Ratio	Pass/Fail
H-3	3568	224.5	4020	67.2	59.8	0.89	Pass

Analytics E7256-125 **		Gamma Filter				Range of 0.80 to 1.25	
Nuclide	RBS Mean pCi/filter	RBS 1-s pCi/filter	Ref Lab Value pCi/filter	Ref Lab Uncertainty pCi/filter	Resolution	RBS/Ref Lab Ratio	Pass/Fail
Ce-141	101.6	3.6	99.5	1.66	59.9	1.02	Pass
Cr-51	173.0	16.4	179	2.98	60.1	0.97	Pass
Cs-134	71.8	3.5	71.1	1.19	59.7	1.01	Pass
Cs-137	75.7	2.5	72.2	1.21	59.7	1.05	Pass
Co-58	59.1	2.2	56.3	0.940	59.9	1.05	Pass
Mn-54	99.8	3.8	91.3	1.52	60.1	1.09	Pass
Fe-59	79.8	1.3	69.7	1.16	60.1	1.14	Pass
Zn-65	158.2	11.4	156	2.60	60.0	1.01	Pass
Co-60	132.3	1.3	130	2.18	59.6	1.02	Pass

Analytics E7257-125 **		Gamma Soil				Range of 0.80 to 1.25	
Nuclide	RBS Mean pCi/g	RBS 1-s pCi/g	Ref Lab Value pCi/g	Ref Lab Uncertainty pCi/g	Resolution	RBS/Ref Lab Ratio	Pass/Fail
Ce-141	0.478	0.012	0.486	0.00812	59.9	0.98	Pass
Cr-51	0.848	0.031	0.872	0.0146	59.7	0.97	Pass
Cs-134	0.325	0.026	0.347	0.00579	59.9	0.94	Pass
Cs-137	0.465	0.003	0.443	0.00740	59.9	1.05	Pass
Co-58	0.270	0.009	0.275	0.00459	59.9	0.98	Pass
Mn-54	0.445	0.015	0.446	0.00745	59.9	1.00	Pass
Fe-59	0.350	0.015	0.340	0.00568	59.9	1.03	Pass
Zn-65	0.778	0.014	0.761	0.0127	59.9	1.02	Pass
Co-60	0.637	0.011	0.638	0.0107	59.6	1.00	Pass