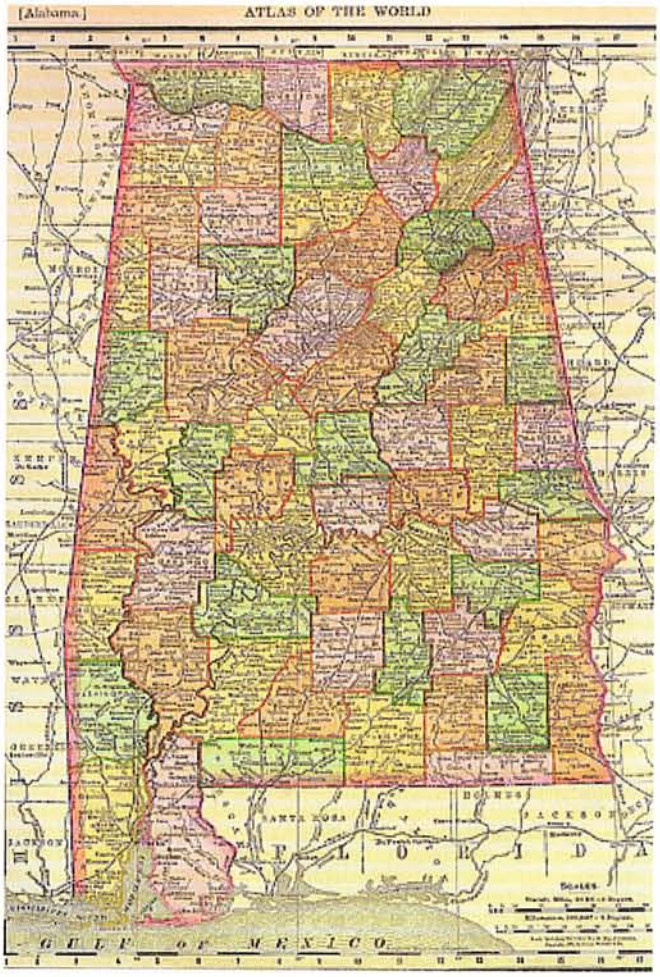
ENVIRONMENTAL RADIATION

IN

ALABAMA

2012



THIS PAGE INTENTIONALLY LEFT BLANK

2012 ANNUAL REPORT
Environmental Radiation in Alabama

January 1, 2012 through December 31, 2012

May 6, 2013

Compiled by:
Robert Suell
Radiation Physicist, Senior

Alabama Department of Public Health
Office of Radiation Control
The RSA Tower Suite 700
201 Monroe Street
PO Box 303017
Montgomery, Alabama 36130-3017
(334) 206-5391

Donald E. Williamson, M.D.

State Health Officer
Alabama Department of Public Health

James L. McNees, CHP

Director, Office of Radiation Control

Joseph F. Price

Laboratory Chief
Alabama Department of Environmental Management

CONTENTS

I. INTRODUCTION

The State of Alabama began environmental monitoring for radioactive materials in the early 1950's. Water surveillance for gross alpha and beta emissions resulted from public concern over fallout from nuclear weapons testing.

The State Board of Health was designated as Alabama Radiation Control Agency under Act Number 582 of the Regular Session of the 1963 State Legislature. The agency was established to regulate, license, and inspect all sources and users of radioactive materials. All devices producing ionizing radiation within the state borders were also regulated.

In 1966, Governor George C. Wallace signed an agreement with the ***Atomic Energy Commission*** (AEC) making Alabama an ***agreement state.*** This act made the State government responsible for surveillance and regulation of nuclear reactor by-product materials within Alabama. Military users were exempted from this agreement and remained regulated by the ***Department of Defense*** (DOD). The nuclear power industry remained under the authority of AEC, later renamed the ***Nuclear Regulatory Commission*** (NRC).

The Division of Radiological Health was created within the Department of Public Health to manage radiation on the State level. This division was renamed the Office of Radiation Control during a departmental reorganization in 1997 and operates the Alabama Radiological Environmental Monitoring Program (AREMP).

AREMP currently monitors two operational nuclear power plants. A third facility, the Bellefonte Nuclear Plant, near Scottsboro, Alabama, is currently in caretaker status awaiting determination of its final use. Monitoring these sites was a part of the Nuclear Regulatory Commission (NRC) monitoring plan beginning in 1983. That year a contract with the NRC and the State of Alabama began and was modified yearly until 1998. January 1, 1998, the NRC did not compensate the state for the monitoring or for the TLD program at Browns Ferry and Farley. At that time the state began bearing the financial burden of the program. No modifications to the monitoring plan were made and the monitoring of the sites continues today.

Besides the monitoring of the nuclear power plants, the AREMP monitors the liquid releases of three facilities licensed by the Alabama Department of Public Health. Saint-Gobain and Wyle Laboratories are located near Huntsville, Alabama. The third company, Eastern Technologies, Inc., is located in Ashford Alabama.

This report summarizes the results of the radiological surveillance for the 2012 calendar year. The following exhibits correspond to the section, subsection, and station names presented in the table of contents. The laboratory analyses performed on these samples indicate negligible radiation compared with background activity. (These analyses conclude that the nuclear related industries in Alabama have contributed negligible radioactivity to the environment.)

II. RADIOLOGICAL SAMPLING & ANALYTICAL PROCEDURES:

Ionizing radiation reaches the body primarily through ingestion, inhalation, and direct exposure to radioactive materials. AREMP monitors all of these pathways. Airborne particulates are sampled for radiological inhalants. Water, vegetation, milk, and other foodstuffs are sampled for radionuclide content.

Direct exposure to radiation is monitored continuously around the two nuclear power plants using ***pressurized ionization chambers*** (PIC). The State of Alabama conducts another direct radiation surveillance program. Dozens of ***thermoluminescent dosimeters*** (TLD) are concentrically stationed around each power plant. These instruments monitor quarterly radiation levels at each location.

A. Airborne Monitoring Program:

1. Airborne Particulates:

Air is monitored for radioactive particles. This report presents analyses from fourteen ***state, split, co-located, Southern Nuclear Operating Co.,*** and ***TVA*** air monitoring stations. ***State*** particulate samples are changed and analyzed weekly using a 50 mm glass fiber filter disc. An average air flow of 2.5 ***cubic feet per minute*** (cfm) flows through these filters. Two ***State*** monitors are operated for one 24 hour period during the week. These monitors are primarily used for emergency planning. All other air samplers are continuously operated for the state surveillance program.

The filters are analyzed for gross beta activity using a low background beta counter. This measurement combined with the flow rate and time of operation is used to calculate the activity of air that passed through the filter. These measurements are presented in pico curies ***per cubic meter*** (pCi/m^3).

2. Radioiodine Samples:

Several of the air monitors also sample radioiodine (radioactive iodine). A charcoal filter is used to trap iodine after the air is filtered for particulates. Charcoal filters are analyzed by direct count of gamma emissions using a ***high purity germanium*** (HPGe) detector. Three air monitors near Browns Ferry sample these isotopes on a weekly basis. Filters from three other stations at Browns Ferry and two stations near Farley are changed and analyzed once each month.

B. Monthly/Quarterly Water Samples:

Monthly water samples are taken by the ***Tennessee Valley Authority*** (TVA) at ***Tennessee River Mile*** (TRM) 293.5 and TRM 306.0. The ***Southern Nuclear Operating Co.*** takes background and indicator samples from the Chattahoochee River at ***Chattahoochee River Mile*** (CRM) 41.0 and CRM 46.9.

AREMP takes additional surface water samples on a quarterly basis. One gallon grab samples are taken from the Tennessee River, the Chattahoochee River, and at various water treatment plants supplied by these rivers. Samples are taken from the Athens Water Treatment Plant on the Elk River and Branch Island Creek. Radioactive runoff from the Browns Ferry area would likely be deposited in these waterways. Water samples are received and analyzed by ADEM. Gross alpha and gross beta measurements are made by evaporating a 250 milliliter water sample to dryness. The residue is counted with a Canberra LB4110 Internal Proportional Counter. Gamma analyses are made on the Canberra DSA 1000.

C. Quarterly Vegetation Samples:

Vegetation samples measure potential accumulation of radioactivity in the vicinity of the operating nuclear plants. These samples consist of crops, grasses, weeds, and other above-ground vegetation growing over the preceding three month period. State samples are collected quarterly at seven predetermined locations around the two facilities.

D. Semiannual Vegetation/Annual Ingestion Pathway Samples:

Southern Nuclear Operating Co. provides split vegetation samples from the Farley vicinity. Southern Nuclear Operating Co. collects one background and two indicator samples semiannually.

Ingestion pathway samples also provide a direct check of any radiological accumulation in the food chain. TVA collected split annual samples of cabbage and potatoes during 2012.

E. Semiannual Fish Samples:

Semiannual fish samples are collected from the Tennessee and Chattahoochee Rivers. TVA provides split samples caught between TRM 275 and TRM 349. Southern Nuclear Operating Co. provides background and indicator samples for both bottom feeding and game fish.

ADEM counts the edible portions of all samples for gross beta and gamma emitting nuclides. Fish samples are not prepared for human consumption prior to laboratory analysis.

F. Annual & Semiannual Sediment Samples:

Discharge sediment samples are taken semiannually at the Browns Ferry plant as an indicator only. Southern Nuclear Operating Co. collects annual background and indicator samples at CRM 46.9 and CRM 41.0 for Farley.

These samples are weighed and counted for gamma photons on a Canberra DSA 1000. Gross alpha and beta measurements are taken with a Canberra LB4110.

G. Direct Radiation Measurements:

1. Quarterly Thermoluminescent Dosimetry:

Thermoluminescent dosimeters continuously measure direct gamma radiation at strategic locations. TVA, Southern Nuclear Operating Co., and AREMP operate independent TLD networks. The net exposure data for Browns Ferry and Farley are presented in the exhibits.

2. Pressurized Ionization Chambers:

AREMP operates two pressurized ionization chamber (PIC) networks. These networks consist of thirteen GE Reuter Stokes RSS-131s. Seven stations are located around Browns Ferry Nuclear Plant and six stations are located around Farley Nuclear Plant, within one half of the ten mile EPZ falling within Alabama.

The PICs record instantaneous exposure rate as well as integrated dose over an interval set by the user. PIC stations consist of a sensor chamber filled with pressurized argon gas, an attached electrometer, and an internal processing unit (RPU). The ionizing radiation produces pairs of ions when it strikes the pressurized gas in the sensor chamber. These ion pairs constitute a flow of current in the sensor which is measured by the electrometer. This tiny current is digitized and stored in memory by the RPU.

The RSS-131s allow interrogation from the central office via phone lines to each unit at an interval set by the user and dependent upon the integration time. By polling the units on demand, exposure rates can be determined around each power plant in near real time. This added capability may improve the response time in the event of an actual emergency. Data obtained from the thirteen locations are summarized on the next page:

RSS-131 PIC Environmental Monitoring			
Station	**Location**	**Yearly Dose**	**Average Dose Rate**
BF NW	2.8 Miles NW of Browns Ferry	77.26mR	8.82 µR/h
BF NNE	2.6 Miles NE of Browns Ferry	68.85mR	7.86 µR/h
BF ENE	3.0 Miles ENE of Browns Ferry	67.01mR	7.65 µR/h
BF ESE	2.8 Miles ESE of Browns Ferry	68.24mR	7.79 µR/h
BF SSE	4.1 Miles SSE of Browns Ferry	73.32mR	8.37 µR/h
BF SSW	2.8 Miles SSW of Browns Ferry	67.63mR	7.72 µR/h
BF WSW	2.2 Miles WSW of Browns Ferry	69.38mR	7.92 µR/h
Damsite Rd	1.3 Miles North of Farley Plant	63.33mR	7.23 µR/h
Whatley Farm	1.1 Miles West of Farley Plant	66.75mR	7.62 µR/h
Cedar Creek	2.3 Miles South of Farley Plant	69.90mR	7.98 µR/h
Ashford	7.0 Miles WSW of Farley Plant	61.85mR	7.06 µR/h
Columbia	4.8 Miles North of Farley Plant	58.78mR	6.71 µR/h
Macedonia	2.1 Miles WNW of Farley Plant	62.72mR	7.16 µR/h

III. LABORATORY PROGRAM:

A. Equipment and Techniques:

The Alabama Department of Environmental Management (ADEM) laboratory analyzes samples collected by AREMP. This facility consists of a wet chemistry laboratory and a counting room. Equipment for counting environmental samples includes two high purity germanium detectors with Canberra DSA 1000 digital signal analyzers running under the Canberra Apex software for low level gamma analysis. The lab has one eight drawer gas flow detector, the Canberra LB4100 alpha/beta system and one Beckman 6500 liquid scintillation counter.

Each instrument is checked daily with a known radioactive standard. The Canberra alpha/beta counters are checked with a cesium 137 beta source and a thorium 230 alpha source. The gamma analyzer is checked with a mixed gamma source that covers the energy range. The liquid scintillation counter is checked with an unquenched carbon 14 standard.

B. ADEM Quality Control Programs:

1. A ***duplicate sample program*** entails running approximately every tenth sample in duplicate, calculating the difference between the duplicate measurements, and estimating the standard deviation.

2. A ***reference sample method*** requires that the technician run a reference sample of known activity before each set of samples.

3. ADEM participates in a ***quality assurance program*** that uses NIST approved samples. The radiological supplier is acceptable to the National Environmental Laboratory Accreditation Conference (NELAC). NELAC is supported by the U. S. Environmental Protection Agency (EPA) as a program for laboratory certification. Also, ADEM participates in the Mixed Analyte Performance Evaluation Program (MAPEP). MAPEP is conducted by the Department of Energy in Idaho National Engineering Laboratory.

4. Finally, the state participates in a ***cross-check program*** between ADEM, Southern Nuclear Operating Co., and TVA. These analyses are compared with split or duplicate environmental samples.

IV. ENVIRONMENTAL RADIOLOGICAL DATA:

A. Reporting of Lower Limits of Detection:

This report presents all measurements detected. In most cases, the measured concentration of radio nuclides proved to be less than the lower detectable limit. These limits are called ***lower limits of detection*** (LLD). LLD *theoretically* define minimal detection capabilities. Measurements above LLD are reported. *Normal* print illustrates the *less reliable* measurements falling below LLD. Measurements where *nothing* was detected are reported as < *LLD*, where *LLD* depicts an isotope's detection limit (Appendices I, II, & III).

Most detection limits reported in the Southern Nuclear Operating Co. exhibits, however, are calculated specifically for each sample. These individual limits are usually lower than the Southern Nuclear Operating Co. LLDs presented in Appendix III.

B. Confidence Intervals/Error Reporting:

Each activity measurement is followed by an error calculation. The State defines this error as a normally distributed 95% confidence interval. This interval represents a 95% probability that the ***actual*** activity of a sample is within ± (plus or minus) the error of the ***measured*** activity. The magnitude of this error depends on factors such as the length of counting time, efficiency of radiochemical separation techniques and detection, and calibration inaccuracies. The error presented for TVA and Southern Nuclear Operating Co. differs with the State. TVA reports ***one sigma error factors***, Southern Nuclear Operating Co. reports ***two sigma error factors***, and the State reports ***two sigma error percentages***. Data was not converted to the same format to insure accurate reporting of all measurements. One sigma error (67% Confidence) differs from two sigma error (95% Confidence) by a factor of two. Negative values are an artifact of converting statistics and do not infer negative activities.

C. Special Reporting:

Laboratory calculations may not be determined due to insufficient data. These measurements may be reported as ***Insufficient Data*** or simply left blank. Other measurements may be reported as ***Equipment Failure*** due to equipment malfunction and/or delivery time for replacement parts. Samples never taken, never received, or lost are reported as ***No Sample***. Finally, some isotopes may be ***Not Measured*** due to the specific type of sample analysis.

D. Laboratory Sample Numbers:

Laboratory sample numbers assigned by TVA are reported whenever available for split or licensee data. ADEM laboratory numbers are provided in most other instances.

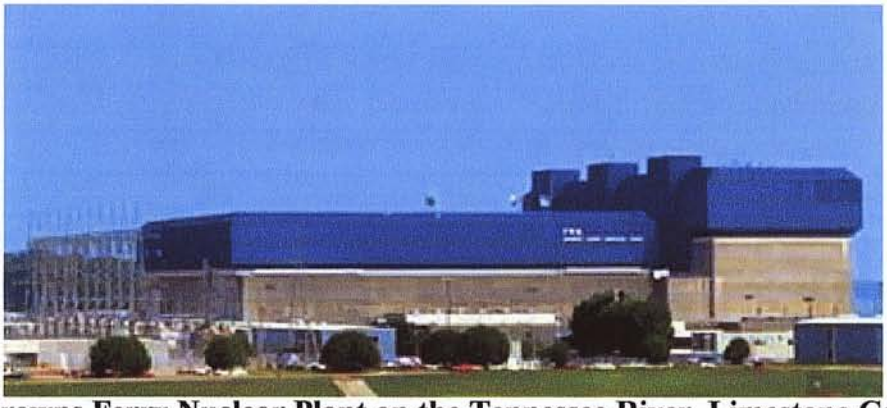
V. BROWNS FERRY NUCLEAR PLANT:

TVA operates the ***Browns Ferry Nuclear Plant*** (BFNP). The facility is located on 840 acres on the north shore of Wheeler Reservoir at TRM 294 in Limestone County. Browns Ferry was the first nuclear power plant to be built by TVA and was the largest nuclear plant in the world when it was constructed.

The site is approximately 10 miles northwest of the city of Decatur, (Population 53,683), 10 miles southwest of Athens, Alabama (Population 24,194), and 24 miles west of the city of Huntsville (Population 180,105). Approximately 4123 people live within a five mile radius of the plant.

The plant consists of three ***boiling water reactors*** (BWR) each rated at 3,293 ***megawatts thermal*** and 1,098 ***megawatts electrical***. Unit 1 first achieved ***criticality*** on August 17, 1973 and became commercially operational on August 1, 1974. Unit 2 began commercial operation on March 1, 1975. A fire in the cable trays forced the shutdown of both reactors on March 22, 1975. Both units resumed operation in August 1976. Unit 3 began testing and became commercially operational in January 1977. Due to persistent and ongoing problems, TVA shut down all of their reactors (including Browns Ferry) in March 1985. Unit 2 was restarted March, 1991. Unit 3 was restarted in late 1995. Unit 1 was restarted May, 2007. Presently all three units are fully operational.

In 1967, the State of Alabama began radiological surveillance of the plant site to gather background radiation data. This pre-operational monitoring established a baseline on the distribution of natural and man-made radioactivity prior to construction. The current AREMP network for Browns Ferry extends throughout parts of Madison, Morgan, Lawrence, Limestone, Colbert, and Lauderdale counties. This network consists of 38 state TLDs, seven PICs, eight surface water sampling stations, two water samples for EPA, eight air sampling stations, and six vegetation sampling stations. Sediment and fish samples are also collected. Analysis of the 2012 surveillance for the Browns Ferry Nuclear Plant is presented in this section. This data indicates insignificant levels of radioactivity compared with background.



Browns Ferry Nuclear Plant on the Tennessee River, Limestone Co, AL

Browns Ferry Air Particulate Data

State Data (Results are pCi/m3)

Athens LCHD

Date On	Date Off	Sample ID	Gross Beta
12/27/2011	1/3/2012	78372	0.0140
1/3/2012	1/9/2012	78416	0.0251
1/9/2012	1/17/2012	78544	0.0081
1/17/2012	1/23/2012	78614	0.0140
1/23/2012	1/31/2012	78655	0.0163
1/31/2012	2/7/2012	78680	0.0120
2/7/2012	2/16/2012	78727	0.0080
2/16/2012	2/24/2012	78786	0.0215
2/24/2012	3/5/2012	78878	0.0140
3/5/2012	3/12/2012	78902	0.0162
3/12/2012	3/19/2012	79029	0.0090
3/19/2012	3/26/2012	79084	0.0165
3/26/2012	4/2/2012	79173	0.0176
4/2/2012	4/10/2012	79326	0.0174
4/10/2012	4/17/2012	79405	0.0232
4/17/2012	4/24/2012	79605	0.0195
4/30/2012	5/7/2012	79781	0.0143
5/7/2012	5/14/2012	79834	0.0189
5/14/2012	5/21/2012	80028	0.0218
5/21/2012	5/29/2012	80108	0.0266
5/29/2012	6/5/2012	80146	0.0146
6/5/2012	6/11/2012	80304	0.0132
6/11/2012	6/20/2012	80485	0.0069
6/20/2012	6/27/2012	80553	0.0505
7/2/2012	7/9/2012	80675	0.0291
7/9/2012	7/16/2012	80844	0.0130
7/16/2012	7/23/2012	80898	0.0060
7/23/2012	7/30/2012	81101	0.0076
7/30/2012	8/7/2012	81204	0.0076
8/7/2012	8/15/2012	81300	0.0202
8/20/2012	8/27/2012	81481	0.0243
8/27/2012	9/4/2012	81609	0.0166
9/4/2012	9/10/2012	81673	0.0098
9/10/2012	9/17/2012	81854	0.0219
9/17/2012	9/24/2012	81936	0.0128

Browns Ferry Air Particulate Data

State Data (Results are pCi/m3)

9/24/2012	10/2/2012	82060	0.0184
10/2/2012	10/9/2012	82220	0.0253
10/9/2012	10/15/2012	82432	0.0264
10/15/2012	10/22/2012	82510	0.0431
10/22/2012	10/29/2012	82536	0.0240
10/29/2012	11/5/2012	82695	0.0269
11/5/2012	11/13/2012	82854	0.0085
11/13/2012	11/19/2012	82887	0.0207
11/19/2012	11/26/2012	82935	0.0220
11/26/2012	12/3/2012	83096	0.0233
12/3/2012	12/10/2012	83140	0.0035
12/10/2012	12/17/2012	83219	0.0081
12/24/2012	12/31/2012	83267	0.0181

Clements

Date On	Date Off	Sample ID	Gross Beta
1/12/2012	1/13/2012	78543	0.0526
1/19/2012	1/20/2012	78562	0.0646
1/26/2012	1/27/2012	78642	0.0332
2/2/2012	2/3/2012	78681	0.0402
2/19/2012	2/20/2012	78772	0.0233
10/31/2012	11/1/2012	82719	0.0475
12/8/2012	12/9/2012	83139	0.0416
12/23/2012	12/24/2012	83252	0.0410
12/30/2012	12/31/2012	83277	0.0635

Decatur Water Treatment Plant

Date On	Date Off	Sample ID	Gross Beta
1/5/2012	1/6/2012	78488	0.0514
1/14/2012	1/15/2012	78616	0.0255
1/19/2012	1/20/2012	78615	0.0476
2/10/2012	2/11/2012	78770	0.0270
2/16/2012	2/17/2012	78781	0.0427
3/1/2012	3/2/2012	78903	0.0360
3/23/2012	3/24/2012	79120	0.0382
4/5/2012	4/6/2012	79278	0.0274
4/12/2012	4/13/2012	79406	0.0330
4/19/2012	4/20/2012	79604	0.0422
4/26/2012	4/27/2012	79780	0.0485

Browns Ferry Air Particulate Data

State Data (Results are pCi/m3)

5/3/2012	5/4/2012	79779	0.0234
5/10/2012	5/11/2012	79835	0.0251
5/16/2012	5/17/2012	80062	0.0551
5/24/2012	5/25/2012	80121	0.0538
5/31/2012	6/1/2012	80120	0.0403
6/7/2012	6/8/2012	80260	0.0271
6/14/2012	6/15/2012	80428	0.0367
6/21/2012	6/22/2012	80621	0.0347
6/29/2012	6/30/2012	80620	0.0599
7/5/2012	7/6/2012	80766	0.0327
7/19/2012	7/20/2012	81096	0.0226
8/2/2012	8/3/2012	81232	0.0314
8/16/2012	8/17/2012	81732	0.0299
9/12/2012	9/13/2012	81738	0.0479
9/20/2012	9/21/2012	81949	0.0357
9/28/2012	9/29/2012	82105	0.0517
10/4/2012	10/5/2012	82219	0.0635
10/11/2012	10/12/2012	82442	0.0485
10/18/2012	10/19/2012	82441	0.0381
10/24/2012	10/25/2012	82717	0.0563
11/1/2012	11/2/2012	82739	0.0093
11/8/2012	11/9/2012	82885	0.0639
11/15/2012	11/16/2012	82886	0.0811
11/22/2012	11/23/2012	82934	0.0895
11/29/2012	11/30/2012	83097	0.0762
12/13/2012	12/14/2012	83218	0.0630
12/21/2012	12/22/2012	83259	0.0401
12/30/2012	12/31/2012	83278	0.0760

Hillsboro, Davis Farm

Date On	Date Off	Sample ID	Gross Beta
1/19/2012	1/26/2012	78643	0.0223
1/26/2012	2/5/2012	78696	0.0240
2/5/2012	2/13/2012	78728	0.0192
2/13/2012	2/20/2012	78782	0.0236
2/20/2012	2/27/2012	78814	0.0149
2/27/2012	3/5/2012	78879	0.0143
3/5/2012	3/12/2012	78963	0.0157

Browns Ferry Air Particulate Data

State Data (Results are pCi/m3)

3/12/2012	3/18/2012	79083	0.0162
3/18/2012	3/26/2012	79119	0.0110
3/26/2012	4/2/2012	79221	0.0125
4/2/2012	4/9/2012	79341	0.0143
4/9/2012	4/16/2012	79407	0.0157
4/16/2012	4/23/2012	79636	0.0170
4/23/2012	4/30/2012	79697	0.0185
4/30/2012	5/7/2012	79795	0.0154
5/7/2012	5/14/2012	79966	0.0133
5/14/2012	5/22/2012	80089	0.0201
5/22/2012	5/28/2012	80110	0.0231
5/28/2012	6/4/2012	80259	0.0147
6/4/2012	6/11/2012	80371	0.0198
6/11/2012	6/18/2012	80429	0.0169
6/18/2012	6/25/2012	80554	0.0157
6/25/2012	7/2/2012	80619	0.0277
7/2/2012	7/9/2012	80765	0.0221
7/9/2012	7/16/2012	80891	0.0115
7/16/2012	7/23/2012	80905	0.0091
7/23/2012	7/30/2012	81102	0.0184
7/30/2012	8/5/2012	81203	0.0097
8/5/2012	8/13/2012	81351	0.0207
8/13/2012	8/20/2012	81414	0.0235
8/20/2012	8/27/2012	81496	0.0282
8/27/2012	9/3/2012	81646	0.0134
9/3/2012	9/10/2012	81731	0.0167
9/10/2012	9/17/2012	81865	0.0186
9/17/2012	9/24/2012	81994	0.0227
9/24/2012	10/1/2012	82059	0.0190
10/1/2012	10/8/2012	82215	0.0243
10/8/2012	10/15/2012	82437	0.0275
10/15/2012	10/22/2012	82511	0.0207
10/22/2012	10/29/2012	82718	0.0279
10/29/2012	11/6/2012	82740	0.0229
11/6/2012	11/12/2012	82856	0.0208
11/12/2012	11/26/2012	83023	0.0327
11/26/2012	12/3/2012	83104	0.0235

Browns Ferry Air Particulate Data

State Data (Results are pCi/m3)

12/3/2012	12/10/2012	83161	0.0120
12/10/2012	12/17/2012	83241	0.0223
12/17/2012	12/24/2012	83258	0.0276

Browns Ferry Air Particulate Split w/TVA

(Results are pCi/m3) State Data TVA Data

LM-4, TVA

Date On	Date Off	Date of Analysis	Sample ID	Gross Beta	Lic Lab ID	Lic Gross Beta
12/27/2011	1/3/2012	1/27/2012	78397	0.0324	220011	0.0235
1/3/2012	1/9/2012	1/27/2012	78489	0.0311	220110	0.0208
1/9/2012	1/17/2012	1/27/2012	78548	0.0243	220189	0.0192
1/17/2012	1/23/2012	2/2/2012	78619	0.0309	220336	0.0222
1/23/2012	1/30/2012	2/15/2012	78663	0.0233	220466	0.0175
1/30/2012	2/6/2012	2/15/2012	78683	0.0246	220577	0.0164
2/6/2012	2/13/2012	2/27/2012	78729	0.0269	220697	0.0195
2/13/2012	2/21/2012	3/20/2012	78787	0.0316	220821	0.0216
2/21/2012	2/27/2012	3/20/2012	78810	0.0218	220994	0.0147
2/27/2012	3/5/2012	3/20/2012	78876	0.0202	221123	0.0146
3/5/2012	3/12/2012	3/29/2012	78915	0.0232	221208	0.0179
3/12/2012	3/19/2012	4/13/2012	79056	0.0163	221338	0.0101
3/19/2012	3/26/2012	4/13/2012	79199	0.0184	221500	0.0126
3/26/2012	4/2/2012	4/30/2012	79202	0.0253	221607	0.0165
4/2/2012	4/9/2012	4/30/2012	79327	0.0194	221691	0.0138
4/9/2012	4/15/2012	4/30/2012	79402	0.0285	221797	0.0225
4/15/2012	4/23/2012	5/10/2012	79606	0.0228	222003	0.0170
4/23/2012	4/30/2012	5/10/2012	79676	0.0267	222134	0.0235
4/30/2012	5/7/2012	5/23/2012	79782	0.0206	222277	0.0159
5/7/2012	5/14/2012	5/23/2012	79963	0.0219	222442	0.0175
5/14/2012	5/21/2012	6/7/2012	80090	0.0333	222592	0.0217
5/21/2012	5/28/2012	6/18/2012	80115	0.0350	222726	0.0263
5/28/2012	6/4/2012	6/14/2012	80159	0.0223	222821	0.0156
6/4/2012	6/11/2012	7/5/2012	80329	0.0185	222929	0.0143
6/11/2012	6/18/2012	7/5/2012	80425	0.0263	223069	0.0171
6/18/2012	6/25/2012	7/11/2012	80559	0.0242	223191	0.0190
6/25/2012	7/2/2012	7/11/2012	80626	0.0286	223275	0.0318
7/2/2012	7/9/2012	8/1/2012	80676	0.0291	223412	0.0254
7/9/2012	7/16/2012	8/1/2012	80841	0.0159	223549	0.0105
7/16/2012	7/23/2012	8/13/2012	80899	0.0176	223714	0.0112

Browns Ferry Air Particulate Split w/TVA

(Results are pCi/m3)

			State Data			TVA Data
7/23/2012	7/30/2012	8/13/2012	81038	0.0196	223801	0.0152
7/30/2012	8/6/2012	8/24/2012	81200	0.0295	223907	0.0239
8/6/2012	8/13/2012	8/24/2012	81297	0.0237	224039	0.0210
8/13/2012	8/20/2012	9/10/2012	81416	0.0349	224144	0.0272
8/20/2012	8/27/2012	9/10/2012	81482	0.0391	224262	0.0334
8/27/2012	9/4/2012	9/24/2012	81604	0.0200	224373	0.0158
9/4/2012	9/10/2012	9/24/2012	81670	0.0232	224520	0.0170
9/10/2012	9/17/2012	10/2/2012	81851	0.0404	224621	0.0307
9/17/2012	9/24/2012	10/2/2012	81937	0.0229	224723	0.0185
9/24/2012	10/2/2012	10/23/2012	82061	0.0330	224823	0.0291
10/2/2012	10/9/2012	10/23/2012	82212	0.0404	224979	0.0301
10/9/2012	10/15/2012	10/23/2012	82221	0.0374	225089	0.0324
10/15/2012	10/22/2012	11/9/2012	82507	0.0338	225213	0.0264
10/22/2012	10/29/2012	11/9/2012	82587	0.0298	225318	0.0262
10/29/2012	11/5/2012	11/28/2012	82692	0.0376	225527	0.0297
11/5/2012	11/13/2012	11/28/2012	82847	0.0303	225626	0.0277
11/13/2012	11/19/2012	12/10/2012	82870	0.0555	225705	0.0403
11/19/2012	11/26/2012	12/10/2012	82939	0.0530	225828	0.0415
11/26/2012	12/3/2012	12/20/2012	83101	0.0444	225961	0.0307
12/3/2012	12/10/2012	1/14/2013	83220	0.0216	226072	0.0156
12/10/2012	12/17/2012	1/14/2013	83246	0.0340	226159	0.0277
12/17/2012	12/24/2012	1/14/2013	83253	0.0394	226290	0.0291
12/24/2012	12/31/2012	1/16/2013	83295	0.0317		

PM-2, TVA

Date On	Date Off	Date of Analysis	Sample ID	Gross Beta	Lic Lab ID	Lic Gross Beta
12/27/2011	1/3/2012	1/27/2012	78399	0.0335	220018	0.0256
1/3/2012	1/9/2012	1/27/2012	78491	0.0263	220117	0.0272
1/9/2012	1/17/2012	1/27/2012	78550	0.0257	220196	0.0178
1/17/2012	1/23/2012	2/2/2012	78621	0.0267	220343	0.0223
1/23/2012	1/30/2012	2/15/2012	78665	0.0240	220473	0.0175
1/30/2012	2/6/2012	2/15/2012	78685	0.0250	220584	0.0163
2/6/2012	2/13/2012	2/27/2012	78731	0.0289	220704	0.0205

Browns Ferry Air Particulate Split w/TVA

(Results are pCi/m3)			State Data		TVA Data	
2/13/2012	2/21/2012	3/20/2012	78789	0.0320	220828	0.0220
2/21/2012	2/27/2012	3/20/2012	78812	0.0234	221001	0.0180
2/27/2012	3/5/2012	3/29/2012	78880	0.0225	221130	0.0152
3/5/2012	3/12/2012	3/29/2012	78917	0.0237	221215	0.0194
3/12/2012	3/19/2012	4/13/2012	79058	0.0189	221345	0.0125
3/19/2012	3/26/2012	4/13/2012	79201	0.0192	221507	0.0146
3/26/2012	4/2/2012	4/30/2012	79204	0.0222	221614	0.0204
4/2/2012	4/9/2012	4/30/2012	79329	0.0181	221698	0.0157
4/9/2012	4/15/2012	4/30/2012	79404	0.0292	221804	0.0234
4/15/2012	4/23/2012	5/10/2012	79608	0.0229	222010	0.0191
4/23/2012	4/30/2012	5/10/2012	79678	0.0248	222141	0.0242
4/30/2012	5/7/2012	5/23/2012	79784	0.0227	222284	0.0160
5/7/2012	5/14/2012	6/7/2012	79965	0.0246	222449	0.0179
5/14/2012	5/21/2012	6/7/2012	80092	0.0324	222599	0.0274
5/21/2012	5/28/2012	6/18/2012	80117	0.0350	222733	0.0297
5/28/2012	6/4/2012	6/14/2012	80161	0.0251	222828	0.0184
6/4/2012	6/11/2012	7/5/2012	80331	0.0226	222936	0.0149
6/11/2012	6/18/2012	7/5/2012	80427	0.0258	223076	0.0211
6/18/2012	6/25/2012	7/11/2012	80561	0.0293	223198	0.0214
6/25/2012	7/2/2012	7/11/2012	80628	0.0399	223282	0.0298
7/2/2012	7/9/2012	8/1/2012	80678	0.0339	223419	0.0263
7/9/2012	7/16/2012	8/1/2012	80843	0.0183	223556	0.0109
7/16/2012	7/23/2012	8/13/2012	80901	0.0170	223723	0.0139
7/23/2012	7/30/2012	8/13/2012	81040	0.0217	223808	0.0176
7/30/2012	8/6/2012	8/24/2012	81202	0.0362	223914	0.0274
8/6/2012	8/13/2012	8/24/2012	81299	0.0287	224046	0.0224
8/13/2012	8/20/2012	9/10/2012	81418	0.0360	224151	0.0273
8/20/2012	8/27/2012	9/10/2012	81484	0.0458	224269	0.0371
8/27/2012	9/4/2012	9/24/2012	81606	0.0206	224380	0.0154
9/4/2012	9/10/2012	9/24/2012	81672	0.0247	224527	0.0191
9/10/2012	9/17/2012	10/2/2012	81853	0.0403	224628	0.0301

Browns Ferry Air Particulate Split w/TVA

(Results are pCi/m3)

			State Data		TVA Data	
9/17/2012	9/24/2012	10/2/2012	81939	0.0253	224730	0.0194
9/24/2012	10/2/2012	10/23/2012	82063	0.0366	224830	0.0264
10/2/2012	10/9/2012	10/23/2012	82214	0.0396	224986	0.0300
10/9/2012	10/15/2012	10/23/2012	82223	0.0378	225096	0.0313
10/15/2012	10/22/2012	11/9/2012	82509	0.0318	225220	0.0243
10/22/2012	10/29/2012	11/9/2012	82589	0.0253	225325	0.0259
10/29/2012	11/5/2012	11/28/2012	82694	0.0411	225534	0.0296
11/5/2012	11/13/2012	11/28/2012	82849	0.0308	225633	0.0263
11/13/2012	11/19/2012	12/10/2012	82872	0.0549	225712	0.0393
11/19/2012	11/26/2012	12/10/2012	82941	0.0527	225835	0.0381
11/26/2012	12/3/2012	12/20/2012	83103	0.0453	225968	0.0318
12/3/2012	12/10/2012	1/14/2013	83222	0.0169	226079	0.0149
12/10/2012	12/17/2012	1/14/2013	83248	0.0366	226166	0.0251
12/17/2012	12/24/2012	1/14/2013	83255	0.0384	226297	0.0260
12/24/2012	12/31/2012	1/16/2013	83297	0.0300		

RM-1, TVA, Muscle Shoals

Date On	Date Off	Date of Analysis	Sample ID	Gross Beta	Lic Lab ID	Lic Gross Beta
12/27/2011	1/3/2012				220023	0.0273
1/3/2012	1/9/2012				220122	0.0229
1/9/2012	1/17/2012				220201	0.0250
1/17/2012	1/23/2012				220348	0.0238
1/23/2012	1/30/2012				220478	0.0170
1/30/2012	2/6/2012				220589	0.0169
2/6/2012	2/13/2012				220709	0.0202
2/13/2012	2/21/2012				220833	0.0224
2/21/2012	2/27/2012				221006	0.0177
2/27/2012	3/5/2012				221135	0.0145
3/5/2012	3/12/2012				221220	0.0168
3/12/2012	3/19/2012				221350	0.0141
3/19/2012	3/26/2012				221512	0.0135
3/26/2012	4/2/2012				221619	0.0178
4/2/2012	4/9/2012				221703	0.0144

Browns Ferry Air Particulate Split w/TVA

(Results are pCi/m3)		State Data	TVA Data
4/9/2012	4/15/2012	221809	0.0209
4/15/2012	4/23/2012	222015	0.0143
4/23/2012	4/30/2012	222146	0.0236
4/30/2012	5/7/2012	222289	0.0129
5/7/2012	5/14/2012	222454	0.0160
5/14/2012	5/21/2012	222604	0.0237
5/21/2012	5/29/2012	222738	0.0270
5/29/2012	6/4/2012	222833	0.0189
6/4/2012	6/11/2012	222941	0.0136
6/11/2012	6/18/2012	223081	0.0179
6/18/2012	6/25/2012	223203	0.0219
6/25/2012	7/2/2012	223287	0.0333
7/2/2012	7/9/2012	223424	0.0235
7/9/2012	7/16/2012	223561	0.0103
7/16/2012	7/23/2012	223730	0.0108
7/23/2012	7/30/2012	223813	0.0148
7/30/2012	8/6/2012	223919	0.0257
8/6/2012	8/13/2012	224051	0.0246
8/13/2012	8/20/2012	224156	0.0296
8/27/2012	9/4/2012	224385	0.0110
9/4/2012	9/10/2012	224532	0.0185
9/10/2012	9/17/2012	224633	0.0297
9/17/2012	9/24/2012	224735	0.0181
9/24/2012	10/2/2012	224835	0.0299
10/2/2012	10/9/2012	224991	0.0277
10/9/2012	10/15/2012	225101	0.0298
10/15/2012	10/22/2012	225225	0.0255
10/22/2012	10/29/2012	225330	0.0244
10/29/2012	11/5/2012	225539	0.0320
11/5/2012	11/13/2012	225638	0.0244
11/13/2012	11/19/2012	225717	0.0403

Browns Ferry Air Particulate Split w/TVA

(Results are pCi/m3)		State Data	TVA Data
11/19/2012	11/26/2012	225840	0.0418
11/26/2012	12/3/2012	225973	0.0317
12/3/2012	12/10/2012	226084	0.0155

Browns Ferry Radioiodine

State Data (Results are pCi/m3)

Station	Date Off	Sample ID	Date of Analysis	I-131 Activity
Athens LCHD				
	1/3/2012	78378	1/9/2012	<0.0700
	1/31/2012	78654	2/6/2012	<0.0700
	3/5/2012	78875	3/14/2012	<0.0700
	4/2/2012	79148	4/10/2012	<0.0700
	5/7/2012	79785	5/22/2012	<0.0700
	6/5/2012	80166	6/11/2012	<0.0700
	7/9/2012	80673	7/31/2012	<0.0700
	8/7/2012	81206	8/15/2012	<0.0700
	9/12/2012	81642	9/14/2012	<0.0700
	10/29/2012	82594	11/9/2012	<0.0700
	11/26/2012	82933	12/4/2012	<0.0700
Clements				
	1/7/2012	78417	1/13/2012	<0.0700
	2/3/2012	78682	2/10/2012	<0.0700
Hillsboro, Davis Farm				
	1/26/2012	78644	2/3/2012	<0.0700
	3/6/2012	78890	3/19/2012	<0.0700
	4/6/2012	79277	4/13/2012	<0.0700
	5/15/2012	79799	5/22/2012	<0.0700
	6/6/2012	80258	6/14/2012	<0.0700
	7/5/2012	80650	7/11/2012	<0.0700
	8/6/2012	81153	8/10/2012	<0.0700
	9/6/2012	81607	9/13/2012	<0.0700
	10/8/2012	82224	10/23/2012	<0.0700
	11/7/2012	82738	11/16/2012	<0.0700
	12/7/2012	83136	12/14/2012	<0.0700

Browns Ferry Radioiodine Split w/TVA

(Results are pCi/m3 | State Data | TVA Data

LM-4, TVA

Sample ID	TVA ID	Date Off	Date of Analysis	I-131 Activity	Lic Collection	Lic I-131 Activity
78398	220013	1/3/2012	1/12/2012	<0.0700	1/3/2012	<0.0300
78490	220112	1/9/2012	1/19/2012	<0.0700	1/9/2012	<0.0300
78549	220191	1/17/2012	1/26/2012	<0.0700	1/17/2012	<0.0300
78620	220338	1/23/2012	2/1/2012	<0.0700	1/23/2012	<0.0300
78664	220468	1/30/2012	2/13/2012	<0.0700	1/30/2012	<0.0300
78684	220579	2/6/2012	2/13/2012	<0.0700	2/6/2012	<0.0300
78730	220699	2/13/2012	2/23/2012	<0.0700	2/13/2012	<0.0300
78788	220823	2/21/2012	3/29/2012	<0.0700	2/21/2012	<0.0300
78811	220996	2/27/2012	3/5/2012	<0.0700	2/27/2012	<0.0300
78877	221125	3/5/2012	3/14/2012	<0.0700	3/5/2012	<0.0300
78916	221210	3/12/2012	3/20/2012	<0.0700	3/12/2012	<0.0300
79057	221340	3/19/2012	3/29/2012	<0.0700	3/19/2012	<0.0300
79200	221502	3/26/2012	4/12/2012	<0.0700	3/26/2012	<0.0300
79203	221609	4/2/2012	4/11/2012	<0.0700	4/2/2012	<0.0300
79328	221693	4/9/2012	4/16/2012	<0.0700	4/9/2012	<0.0300
79403	221799	4/15/2012	4/25/2012	<0.0700	4/15/2012	<0.0300
79607	222005	4/23/2012	5/2/2012	<0.0700	4/23/2012	<0.0300
79677	222136	4/30/2012	5/7/2012	<0.0700	4/30/2012	<0.0300
79783	222279	5/7/2012	5/22/2012	<0.0700	5/7/2012	<0.0300
79964	222444	5/14/2012	5/30/2012	<0.0700	5/14/2012	<0.0300
80091	222594	5/21/2012	6/6/2012	<0.0700	5/21/2012	<0.0300
80116	222728	5/28/2012	6/6/2012	<0.0700	5/28/2012	<0.0300
80160	222823	6/4/2012	6/11/2012	<0.0700	6/4/2012	<0.0300
80330	222931	6/11/2012	6/19/2012	<0.0700	6/11/2012	<0.0300
80426	223071	6/18/2012	6/25/2012	<0.0700	6/18/2012	<0.0300
80560	223193	6/25/2012	7/3/2012	<0.0700	6/25/2012	<0.0300
80627	223277	7/2/2012	7/10/2012	<0.0700	7/2/2012	<0.0300
80677	223414	7/9/2012	7/31/2012	<0.0700	7/9/2012	<0.0300
80842	223551	7/16/2012	7/31/2012	<0.0700	7/16/2012	<0.0300
80900	223716	7/23/2012	7/31/2012	<0.0700	7/23/2012	<0.0300
81039	223803	7/30/2012	8/7/2012	<0.0700	7/30/2012	<0.0300
81201	223909	8/6/2012	8/15/2012	<0.0700	8/6/2012	<0.0300
81298	224041	8/13/2012	8/24/2012	<0.0700	8/13/2012	<0.0300

Browns Ferry Radioiodine Split w/TVA

(Results are pCi/m3			State Data		TVA Data	
81417	224146	8/20/2012	8/28/2012	<0.0700	8/20/2012	<0.0300
81483	224264	8/27/2012	9/5/2012	<0.0700	8/27/2012	<0.0300
81605	224375	9/4/2012	9/12/2012	<0.0700	9/4/2012	<0.0300
81671	224522	9/10/2012	9/17/2012	<0.0700	9/10/2012	<0.0300
81852	224623	9/17/2012	9/27/2012	<0.0700	9/17/2012	<0.0300
81938	224725	9/24/2012	10/2/2012	<0.0700	9/24/2012	<0.0300
82062	224825	10/2/2012	10/9/2012	<0.0700	10/2/2012	<0.0300
82213	224981	10/9/2012	10/23/2012	<0.0700	10/9/2012	<0.0300
82222	225091	10/15/2012	10/23/2012	<0.0700	10/15/2012	<0.0300
82508	225215	10/22/2012	11/1/2012	<0.0700	10/22/2012	<0.0300
82588	225320	10/29/2012	11/6/2012	<0.0700	10/29/2012	<0.0300
82693	225529	11/5/2012	11/13/2012	<0.0700	11/5/2012	<0.0300
82848	225628	11/13/2012	11/20/2012	<0.0700	11/13/2012	<0.0300
82871	225707	11/19/2012	11/29/2012	<0.0700	11/19/2012	<0.0300
82940	225830	11/26/2012	12/4/2012	<0.0700	11/26/2012	<0.0300
83102	225963	12/3/2012	12/13/2012	<0.0700	12/3/2012	<0.0300
83221	226074	12/10/2012	1/7/2013	<0.0700	12/10/2012	<0.0300
83247	226161	12/17/2012	1/8/2013	<0.0700	12/17/2012	<0.0300
83254	226292	12/24/2012	1/7/2013	<0.0700	12/24/2012	<0.0300
83296		12/31/2012	1/14/2013	<0.0700		<0.0300

Browns Ferry Radioiodine

TVA Data (Results are pCi/m3)

PM-2, TVA

Lic Collection Date	Lic Sample ID	Lic I-131 Activity
1/3/2012	220020	<0.0300
1/9/2012	220119	<0.0300
1/17/2012	220198	<0.0300
1/23/2012	220345	<0.0300
1/30/2012	220475	<0.0300
2/6/2012	220586	<0.0300
2/13/2012	220706	<0.0300
2/21/2012	220830	<0.0300
2/27/2012	221003	<0.0300
3/5/2012	221132	<0.0300
3/12/2012	221217	<0.0300
3/19/2012	221347	<0.0300
3/26/2012	221509	<0.0300
4/2/2012	221616	<0.0300
4/9/2012	221700	<0.0300
4/15/2012	221806	<0.0300
4/23/2012	222012	<0.0300
4/30/2012	222143	<0.0300
5/7/2012	222286	<0.0300
5/14/2012	222451	<0.0300
5/21/2012	222601	<0.0300
5/28/2012	222735	<0.0300
6/4/2012	222830	<0.0300
6/11/2012	222938	<0.0300
6/18/2012	223078	<0.0300
6/25/2012	223200	<0.0300
7/2/2012	223284	<0.0300
7/9/2012	223421	<0.0300

Browns Ferry Radioiodine

TVA Data (Results are pCi/m3)

7/16/2012	223558	<0.0300
7/23/2012	223725	<0.0300
7/30/2012	223810	<0.0300
8/6/2012	223916	<0.0300
8/13/2012	224048	<0.0300
8/20/2012	224153	<0.0300
8/27/2012	224271	<0.0300
9/4/2012	224382	<0.0300
9/10/2012	224529	<0.0300
9/17/2012	224630	<0.0300
9/24/2012	224732	<0.0300
10/2/2012	224832	<0.0300
10/9/2012	224988	<0.0300
10/15/2012	225098	<0.0300
10/22/2012	225222	<0.0300
10/29/2012	225327	<0.0300
11/5/2012	225536	<0.0300
11/13/2012	225635	<0.0300
11/19/2012	225714	<0.0300
11/26/2012	225830	<0.0300
12/3/2012	225963	<0.0300
12/10/2012	226074	<0.0300
12/17/2012	226161	<0.0300
12/24/2012	226292	<0.0300

RM-1, TVA, Control

Lic Collection Date	Lic Sample ID	Lic I-131 Activity
1/3/2012	220026	<0.0300
1/9/2012	220125	<0.0300
1/17/2012	220204	<0.0300
1/23/2012	220363	<0.0300

Browns Ferry Radioiodine

TVA Data (Results are pCi/m3)

1/30/2012	220481	<0.0300
2/6/2012	220592	<0.0300
2/13/2012	220712	<0.0300
2/21/2012	220847	<0.0300
2/27/2012	221007	<0.0300
3/5/2012	221136	<0.0300
3/12/2012	221221	<0.0300
3/19/2012	221351	<0.0300
3/26/2012	221513	<0.0300
4/2/2012	221620	<0.0300
4/9/2012	221704	<0.0300
4/15/2012	221810	<0.0300
4/23/2012	222016	<0.0300
4/30/2012	222147	<0.0300
5/7/2012	222290	<0.0300
5/14/2012	222455	<0.0300
5/21/2012	222605	<0.0300
5/29/2012	222739	<0.0300
6/4/2012	222834	<0.0300
6/11/2012	222942	<0.0300
6/18/2012	223082	<0.0300
6/25/2012	223204	<0.0300
7/2/2012	223290	<0.0300
7/9/2012	223425	<0.0300
7/16/2012	223564	<0.0300
7/23/2012	223731	<0.0300
7/30/2012	223814	<0.0300
8/6/2012	223920	<0.0300
8/13/2012	224052	<0.0300
8/20/2012	224157	<0.0300
9/4/2012	224386	<0.0300

Browns Ferry Radioiodine

TVA Data (Results are pCi/m3)

9/10/2012	224533	<0.0300
9/17/2012	224634	<0.0300
9/24/2012	224736	<0.0300
10/2/2012	224836	<0.0300
10/9/2012	224992	<0.0300
10/15/2012	225102	<0.0300
10/22/2012	225226	<0.0300
10/29/2012	225331	<0.0300
11/5/2012	225540	<0.0300
11/13/2012	225639	<0.0300
11/19/2012	225718	<0.0300
11/26/2012	225841	<0.0300
12/3/2012	225974	<0.0300
12/10/2012	226085	<0.0300

Browns Ferry Nuclear Plant: Waterborne

State Data — Results are pCi/L

Station	Sample ID	Collection Date	Analysis Date	Gross Alpha	% Error	Gross Beta	% Error	Potassium 40
Athens WTP								
	78484	1/12/2012	1/27/2012	2.83	0.32	5.45	0.36	<MDL
	79197	4/5/2012	4/30/2012	<MDL	0	4.26	0.36	<MDL
	80759	7/12/2012	8/21/2012	1.63	0.54	2.75	0.66	<MDL
	82142	10/11/2012	11/13/2012	1.40	0.47	4.69	0.3	57.80
Branch Island Creek								
	78482	1/12/2012	1/27/2012	1.53	0.49	7.85	0.23	<MDL
	79195	4/5/2012	4/30/2012	1.28	0	5.19	0	<MDL
	80757	7/12/2012	8/20/2012	1.72	0.49	5.80	0.32	118.0
	82140	10/11/2012	11/13/2012	<MDL	0	3.56	0.36	<MDL
Decatur WTP								
	78477	1/11/2012	1/27/2012	4.11	0.28	7.87	0.25	<MDL
	79190	4/4/2012	4/24/2012	1.62	0.53	6.39	0.29	50.0
	80752	7/11/2012	8/10/2012	1.49	0.63	6.41	0.31	<MDL
	82135	10/10/2012	11/1/2012	1.69	0.43	6.51	0.25	44.3
Huntsville WTP								
	78479	1/11/2012	1/27/2012	2.76	0.38	5.34	0.36	<MDL
	79192	4/4/2012	4/24/2012	1.37	0.65	4.41	0.39	<MDL
	80754	7/11/2012	8/10/2012	2.26	0.44	7.42	0.26	<MDL
	82137	10/10/2012	11/1/2012	<MDL	0	4.15	0.35	59.5
Paradise Shores Boat Launch								
	78483	1/12/2012	1/30/2012	1.73	0.5	5.89	0.29	46.80
	79196	4/5/2012	4/30/2012	1.25	0.6	3.84	0.39	<MDL

Browns Ferry Nuclear Plant: Waterborne

State Data — Results are pCi/L

Station	Sample ID	Collection Date	Analysis Date	Gross Alpha	% Error	Gross Beta	% Error	Potassium 40
	80758	7/12/2012	8/22/2012	2.58	0.38	6.03	0.32	<MDL
	82141	10/11/2012	11/13/2012	1.14	0.6	4.11	0.33	<MDL
Sheffield WTP								
	78485	1/12/2012	1/30/2012	1.37	0	4.42	0	<MDL
	79198	4/5/2012	4/30/2012	<MDL	0	3.28	0.46	<MDL
	80760	7/12/2012	8/21/2012	1.11	0.68	6.37	0.29	128.0
	82143	10/11/2012	11/13/2012	1.70	0.41	3.62	0.37	<MDL
TRM 293.5, BF NPP, TVA								
	78678	1/23/2012	2/23/2012	1.53	0.44	5.18	0.31	<MDL
	78780	2/21/2012	3/30/2012	0	0	2.07	0	<MDL
	79086	3/19/2012	4/24/2012	1.11	0.67	4.99	0.31	<MDL
	79516	4/15/2012	5/24/2012	1.06	0.65	4.03	0.46	59.0
	79939	5/14/2012	6/27/2012	<MDL	0	2.67	0.6	<MDL
	80897	7/9/2012	10/1/2012	1.53	0.6	4.90	0.44	93.30
	81231	8/6/2012	10/19/2012	1.21	0.5	5.19	0.29	83.1
	81846	9/4/2012	10/22/2012	1.09	0.54	6.77	0.22	<MDL
	82058	10/2/2012	10/23/2012	<MDL	0	<MDL	0	<MDL
	82943	10/29/2012	12/17/2012	<MDL	0	3.68	0.37	<MDL
	82947	11/26/2012	1/7/2013	<MDL	0	3.83	0.38	<MDL
	83268	12/24/2012	1/23/2013	<MDL	0	3.33	0.4	<MDL
TRM 306.0, BF NPP, TVA								
	78677	1/23/2012	2/23/2012	1.25	0	4.40	0	<MDL
	79085	3/19/2012	4/24/2012	0	0	4.78	0.32	<MDL

Browns Ferry Nuclear Plant: Waterborne

State Data

Results are pCi/L

Station	Sample ID	Collection Date	Analysis Date	Gross Alpha	% Error	Gross Beta	% Error	Potassium 40
	79515	4/15/2012	5/24/2012	1.90	0.45	4.09	0.45	<MDL
	79938	5/14/2012	6/21/2012	1.44	0.54	3.37	0.49	<MDL
	80592	6/11/2012	7/10/2012	<MDL	0	2.88	0	<MDL
	80896	7/9/2012	10/1/2012	2.34	0	9.07	0	107.0
	81230	8/6/2012	10/19/2012	1.27	0	4.46	0	<MDL
	81845	9/4/2012	10/22/2012	1.01	0.56	5.20	0.26	164.0
	82057	10/2/2012	10/23/2012	<MDL	0	2.51	0.54	<MDL
	82942	10/29/2012	12/17/2012	2.37	0	4.63	0	<MDL
	82946	11/26/2012	12/20/2012	1.11	0.58	3.77	0.37	<MDL
	83394	12/24/2012	2/4/2013	<MDL	0	7.08	0.17	<MDL

Browns Ferry Vegetation Samples

State Samples

Station	Sample ID	Collection Date	Analysis Date	K-40 (pCi/g)	Other Isotope (pCi/g)
Browns Ferry East					
	78476	1/12/2012	2/2/2012	41.9	<MDL
	79189	4/5/2012	4/25/2012	14.8	<MDL
	80751	7/12/2012	8/17/2012	0	<MDL
	82134	10/11/2012	10/26/2012	14.2	<MDL
Browns Ferry North					
	78473	1/12/2012	1/31/2012	49.2	<MDL
	79186	4/5/2012	4/20/2012	16.7	<MDL
	80748	7/12/2012	8/16/2012	0	<MDL
	82131	10/11/2012	10/25/2012	0	<MDL
Browns Ferry South					
	78475	1/12/2012	2/1/2012	27.7	<MDL
	79188	4/4/2012	4/24/2012	27.3	<MDL
	80750	7/12/2012	8/17/2012	0	<MDL
	82133	10/11/2012	10/26/2012	12	<MDL
Browns Ferry West					
	78474	1/12/2012	1/31/2012	60.8	<MDL
	79187	4/4/2012	4/24/2012	28.6	<MDL
	80749	7/12/2012	8/16/2012	0	<MDL
	82132	10/11/2012	10/25/2012	0	<MDL

TVA BF Vegetation Samples

Station	Collection Date	Lic Sample	Lic's K-40 (pCi/g)	Lic's Other Isotope (pCi/g)
Apples				
	10/12/2012	222118	0.710	0.096
Cabbage				
	6/7/2012	222113	2.425	0.010
Corn				
	6/6/2012	222115	1.620	0.079
Green Beans				
	9/11/2012	222116	2.226	0.190

Browns Ferry Split Fish Samples w/TVA

State Analysis (Results are pCi/g) TVA Analysis

Wheeler Reservoir; @ BF

Sample ID	Lic Sample	Collection Date	Analysis Date	K-40	Other Isotope	Lic K-40	Lic Other Isotope
80662	222154	6/19/2012	8/7/2012	15.5	Cs137 .017	14.56	0.15
83420	225350	11/19/2012	2/4/2013	15.8	Cs137 .023	14.2	0.13

Sediment Samples Split w/TVA

(Results are pCi/g)

Mallard Ck Rec Area

Sample ID	Collection Date	Analysis Date	K-40	Lic K40
80118	4/27/2012	6/27/2012	0	0.094
83138	10/31/2012	1/7/2013	0	0.146

Alabama TLD Data for Browns Ferry NPP

Location	Quarter	mRem/Qtr
01-Huntsville		
25 Mi @ 090	1st	19
	2nd	19
	3rd	23
	4th	21
02-Decatur		
8.8 Mi @ 133	1st	18
	2nd	19
	3rd	19
	4th	21
03-Finley Is Rd		
5.4 Mi @135	1st	21
	2nd	23
	3rd	27
	4th	24
04-TVA Substation		
7.5 Mi @150	1st	21
	2nd	22
	3rd	26
	4th	24
05-Trinity		
7.0 Mi @166	1st	17
	2nd	17
	3rd	22
	4th	19
06-Mallard Fox Rd		
4.1 Mi @ 147	1st	21
	2nd	20
	3rd	25
	4th	25
07-1675 Co Rd 439		
2.8 Mi @ 194	1st	23
	2nd	20
	3rd	23
	4th	21
08-Baker Bottom Rd		
3.0 Mi @ 205	1st	21
	2nd	21
	3rd	26
	4th	21
09-Browns Ferry Rd		
1.7 Mi @220	1st	19
	2nd	19
	3rd	22
	4th	19
10-Davis Farm		
2.7 Mi @241	1st	19
	2nd	20
	3rd	24
	4th	22
11-Lakeview Cabins		
1.9 Mi @270	1st	20
	2nd	20
	3rd	25
	4th	22
12-Wheeler Station		
4.5 Mi @292	1st	18
	2nd	18
	3rd	25
	4th	21

Alabama TLD Data for Browns Ferry NPP

Location	Quarter	mRem/Qtr
13-Spring Creek & Lock Rd		
7.0 Mi @ 296	1st	20
	2nd	21
	3rd	24
	4th	23
14-David Temple Church		
4.6 Mi @ 247	1st	24
	2nd	22
	3rd	27
	4th	27
15-Porter Cemetery		
4.7 Mi @ 269	1st	21
	2nd	20
	3rd	23
	4th	23
16-Hillsboro		
6.2 Mi @ 222	1st	20
	2nd	18
	3rd	23
	4th	21
17-Tenn Valley Head Start		
5.9 Mi @ 212	1st	22
	2nd	18
	3rd	22
	4th	19
18-Goode & Settle Rd		
5.2Mi @ 096	1st	21
	2nd	20
	3rd	24
	4th	23

Location	Quarter	mRem/Qtr
19-Htv & Settle Rd		
5.5 Mi @068	1st	20
	2nd	21
	3rd	22
	4th	24
20-Cowford Rd		
2.7 Mi @ 084	1st	22
	2nd	22
	3rd	27
	4th	26
21-End of Cowford Rd		
2.9 Mi @ 114	1st	21
	2nd	22
	3rd	23
	4th	22
22-Oak Grove Church		
3.0 Mi @ 061	1st	20
	2nd	20
	3rd	25
	4th	21
23-BF & Cowford Rds		
3.4 Mi @051	1st	19
	2nd	19
	3rd	25
	4th	23
24-Lawngate & BF Rds		
2.1 Mi @ 042	1st	20
	2nd	22
	3rd	24
	4th	24

Alabama TLD Data for Browns Ferry NPP

Location	Quarter	mRem/Qtr
25-Cox Cemetery		
0.9 Mi @ 058	1st	22
	2nd	22
	3rd	29
	4th	24
26-BF Met Tower		
0.6 Mi @ 110	1st	23
	2nd	24
	3rd	29
	4th	24
27-Paradise Shores		
1.0 Mi @ 330	1st	20
	2nd	20
	3rd	24
	4th	23
28-Poplar Point		
1.9 Mi @ 327	1st	20
	2nd	19
	3rd	24
	4th	22
29-Shaw & Lawngate Rd		
1.5 Mi @ 356	1st	22
	2nd	22
	3rd	26
	4th	22
30-Lawngate and Mack Rd		
1.7 Mi @ 023	1st	22
	2nd	23
	3rd	29
	4th	25
31-Ripley & McCormack Rd		
3.7 Mi @ 026	1st	22
	2nd	24
	3rd	25
	4th	25
32-Ripley City Hall		
4.0 Mi @ 358	1st	19
	2nd	22
	3rd	25
	4th	22
33-Snake & Ripley Rds		
5.6 Mi @ 334	1st	20
	2nd	24
	3rd	27
	4th	23
34-BF & Miller Rds		
6.5 Mi @ 052	1st	18
	2nd	18
	3rd	23
	4th	22
35-BF Rd & Hwy 72		
9.5 Mi @ 051	1st	20
	2nd	21
	3rd	25
	4th	23
36- Rogersville		
12 Mi @ 312	1st	22
	2nd	24
	3rd	26
	4th	25

Alabama TLD Data for Browns Ferry NPP

Location	Quarter	mRem/Qtr	Location	Quarter	mRem/Qtr
37-Town Creek					
17 Mi @ 268	1st	20			
	2nd	21			
	3rd	24			
	4th	22			
38-Courtland					
11.1 Mi @ 257	1st	18			
	2nd	18			
	3rd	23			
	4th	20			

Browns Ferry/TVA TLD Data

Location	Quarter	mRem/Qtr
E-1		
0.8/85	1st	19.6
	2nd	20.6
	3rd	16.3
	4th	18.7
E-2		
5.2/91	1st	15.7
	2nd	14.7
	3rd	14.9
	4th	13.0
E-3		
23.1/90	1st	18.3
	2nd	16.0
	3rd	15.4
	4th	16.3
ENE-1		
0.9/61	1st	21.5
	2nd	15.1
	3rd	18.3
	4th	18.7
ENE-2		
6.2/62	1st	19.6
	2nd	16.9
	3rd	13.4
	4th	14.4
ESE-1		
0.9/110	1st	18.3
	2nd	15.6
	3rd	13.9
	4th	15.9
ESE-2		
3.0/112	1st	17.0
	2nd	13.7
	3rd	16.3
	4th	15.9
N-1		
1.0/348	1st	22.2
	2nd	17.8
	3rd	17.8
	4th	17.3
N-1A		
1.0/355	1st	19.6
	2nd	20.1
	3rd	16.8
	4th	19.2
N-2		
5.0/1	1st	16.4
	2nd	16.0
	3rd	13.4
	4th	14.4
NE-1		
0.8/51	1st	21.5
	2nd	17.4
	3rd	16.3
	4th	20.6
NE-2		
5.0/49	1st	20.9
	2nd	20.1
	3rd	14.9
	4th	18.3

Browns Ferry/TVA TLD Data

Location	Quarter	mRem/Qtr	Location	Quarter	mRem/Qtr
NE-3			**NNW-3**		
10.9/56	1st	17.0	5.2/339	1st	18.3
	2nd	14.2		2nd	16.5
	3rd	12.5		3rd	15.4
	4th	13.0		4th	14.4
NNE-1			**NW-1**		
0.9/12	1st	21.5	2.2/326	1st	13.8
	2nd	17.8		2nd	13.7
	3rd	16.3		3rd	12.0
	4th	19.7		4th	12.5
NNE-2			**NW-2**		
0.7/31	1st	23.5	5.3/321	1st	15.7
	2nd	18.3		2nd	14.7
	3rd	18.3		3rd	13.9
	4th	17.3		4th	14.9
NNE-3			**NW-3**		
5.2/19	1st	17.0	13.8/310	1st	18.3
	2nd	14.7		2nd	11.9
	3rd	14.4		3rd	12.0
	4th	13.5		4th	12.5
NNW-1			**S-1**		
1.0/331	1st	19.0	3.1/185	1st	20.9
	2nd	16.5		2nd	14.2
	3rd	17.8		3rd	13.9
	4th	14.9		4th	13.5
NNW-2			**S-2**		
1.7/331	1st	17.0	4.8/182	1st	14.5
	2nd	16.5		2nd	11.5
	3rd	15.9		3rd	11.5
	4th	15.4		4th	12.5

Browns Ferry/TVA TLD Data

Location	Quarter	mRem/Qtr	Location	Quarter	mRem/Qtr
SE-1			**SW-1**		
0.5/130	1st	21.5	2.9/228	1st	17.7
	2nd	18.8		2nd	14.7
	3rd	14.9		3rd	15.4
	4th	22.1		4th	15.9
SE-2			**SW-2**		
5.4/135	1st	19.6	4.7/219	1st	18.3
	2nd	16.5		2nd	15.6
	3rd	12.9		3rd	14.4
	4th	15.4		4th	16.8
SSE-1			**W-1**		
5.1/163	1st	13.8	1.9/275	1st	18.3
	2nd	14.7		2nd	16.0
	3rd	15.4		3rd	16.3
	4th	14.4		4th	14.4
SSE-2			**W-2**		
7.5/165	1st	18.3	4.7/268	1st	17.7
	2nd	14.2		2nd	15.2
	3rd	13.9		3rd	13.9
	4th	14.4		4th	14.0
SSW-1			**W-3**		
3.0/203	1st	12.5	31.3/275	1st	14.5
	2nd	13.3		2nd	15.6
	3rd	11.0		3rd	12.5
	4th	12.1		4th	14.4
SSW-2			**WNW-1**		
4.4/199	1st	18.3	3.3/291	1st	15.1
	2nd	15.6		2nd	14.2
	3rd	13.4		3rd	11.5
	4th	16.3		4th	15.9

Browns Ferry/TVA TLD Data

Location	Quarter	mRem/Qtr	Location	Quarter	mRem/Qtr
WNW-2					
4.4/293	1st	14.5			
	2nd	14.7			
	3rd	13.9			
	4th	14.0			
WSW-1					
2.7/244	1st	11.9			
	2nd	13.7			
	3rd	13.4			
	4th	13.5			
WSW-2					
5.1/251	1st	17.7			
	2nd	16.5			
	3rd	14.9			
	4th	15.4			
WSW-3					
10.5/257	1st	20.2			
	2nd	11.9			
	3rd	14.4			
	4th	13.5			

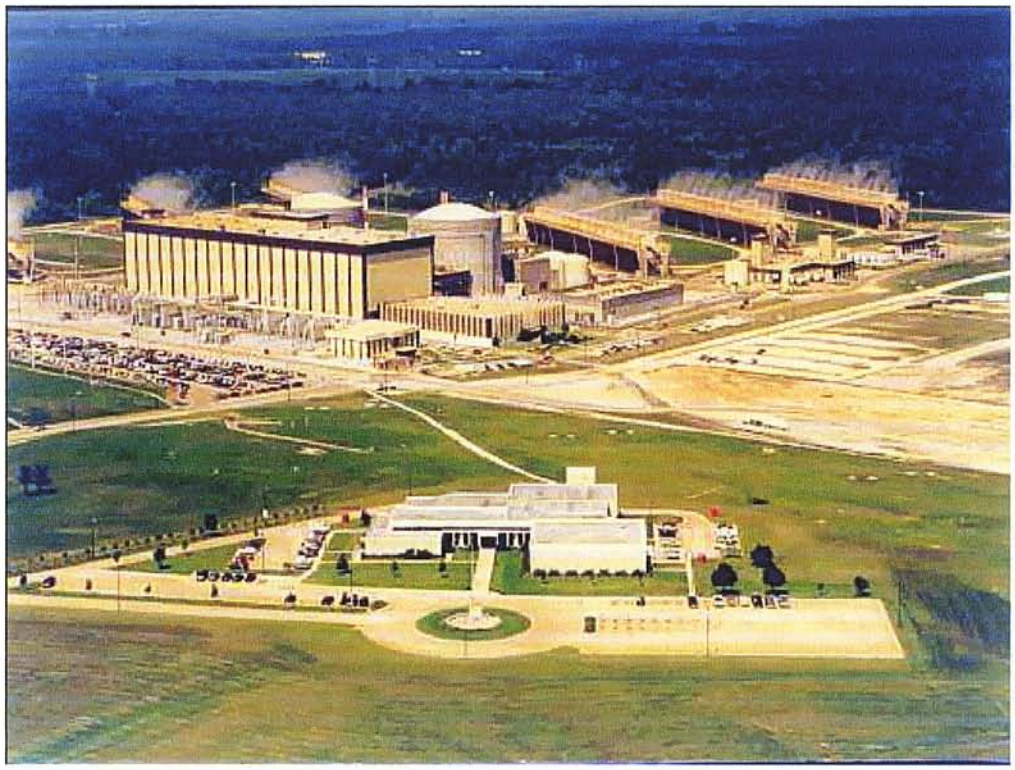
VI. JOSEPH M. FARLEY NUCLEAR PLANT:

The ***Joseph M. Farley Nuclear Plant*** (FNP) is located in Houston County on the west bank of the Chattahoochee River at the Alabama-Georgia state line. Dothan, Alabama (Population 65,496), the largest city in the area, is located approximately 15 miles west of the plant.

The Farley facility is one of the three nuclear plants operated by the Southern Nuclear Operating Company. This plant consists of two Westinghouse, ***pressurized water reactors*** (PWR) with a rated output of 860 Megawatts. Unit 1 achieved initial criticality at 12:35 PM on August 9, 1977. This unit became commercially operational December 1, 1977. Unit 2 achieved initial criticality at 11:21 AM on May 9, 1981. Presently, both units are fully operational.

In 1974, the State of Alabama began radiological surveillance of the plant site to gather background radiation data. This pre-operational monitoring established a baseline on the distribution of natural and man-made radioactivity prior to construction. The current AREMP network extends throughout Houston County, Alabama. This network consists of 26 state TLDs, six PICs, four surface water sampling stations, one quarterly water sample for EPA, five air sampling stations, and six vegetation sampling stations. Fish and sediment samples are also collected. Analysis of the 2012 surveillance for the Joseph M. Farley Nuclear Plant is presented in this section. This data indicates insignificant levels of radioactivity compared with background.

Farley Nuclear Power Plant, Houston Co., AL



Farley Air Particulate Split w/SN

(Results are pCi/m3) State Data Southern Nuclear Data

Columbia, AL

Date On	Date Off	Sample ID	Gross Beta	Lic Gross Beta
12/27/2011	1/3/2012	78376	0.0329	
1/3/2012	1/10/2012	78547	0.0321	
1/10/2012	1/17/2012	78559	0.0311	
1/17/2012	1/24/2012	78613	0.0319	
1/24/2012	1/31/2012	78662	0.0248	
1/31/2012	2/7/2012	78694	0.0258	
2/7/2012	2/14/2012	78758	0.0315	
2/14/2012	2/21/2012	78775	0.0256	
2/21/2012	2/28/2012	78817	0.0234	
2/28/2012	3/6/2012	78888	0.0185	
3/6/2012	3/13/2012	78979	0.0207	
3/13/2012	3/20/2012	79037	0.0219	
3/20/2012	3/27/2012	79123	0.0220	
3/27/2012	4/3/2012	79262	0.0284	
4/3/2012	4/10/2012	79394	0.0232	
4/10/2012	4/17/2012	79410	0.0308	
4/17/2012	4/24/2012	79639	0.0265	
4/24/2012	5/1/2012	79681	0.0292	
5/1/2012	5/8/2012	79798	0.0162	
5/8/2012	5/15/2012	79944	0.0256	
5/15/2012	5/22/2012	80065	0.0320	
5/22/2012	5/29/2012	80113	0.0289	
5/29/2012	6/5/2012	80164	0.0270	
6/5/2012	6/11/2012	80309	0.0173	
6/11/2012	6/19/2012	80493	0.0145	
6/19/2012	6/26/2012	80558	0.0166	
6/26/2012	7/3/2012	80624	0.0293	
7/3/2012	7/10/2012	80689	0.0266	
7/10/2012	7/17/2012	80895	0.0148	
7/17/2012	7/24/2012	81005	0.0173	

Farley Air Particulate Split w/SN

(Results are pCi/m3)

			State Data	Southern Nuclear Data
7/24/2012	7/31/2012	81156	0.0228	
7/31/2012	8/7/2012	81188	0.0282	
8/7/2012	8/14/2012	81354	0.0220	
8/14/2012	8/21/2012	81421	0.0178	
8/21/2012	8/28/2012	81592	0.0301	
8/28/2012	9/4/2012	81595	0.0168	
9/4/2012	9/11/2012	81741	0.0251	
9/11/2012	9/18/2012	81864	0.0210	
9/18/2012	9/25/2012	81952	0.0441	
9/25/2012	10/2/2012	82036	0.0267	
10/2/2012	10/9/2012	82218	0.0386	
10/9/2012	10/16/2012	82436	0.0532	
10/16/2012	10/23/2012	82514	0.0386	
10/23/2012	10/30/2012	82583	0.0315	
10/30/2012	11/6/2012	82731	0.0461	
11/6/2012	11/13/2012	82852	0.0332	
11/13/2012	11/19/2012	82890	0.0298	
11/19/2012	11/27/2012	82938	0.0433	
11/27/2012	12/4/2012	83107	0.0334	
12/4/2012	12/11/2012	83164	0.0232	
12/11/2012	12/18/2012	83251	0.0340	
12/18/2012	12/26/2012	83264	0.0251	

Dothan, AL, Control Station

Date On	Date Off	Sample ID	Gross Beta	Lic Gross Beta
12/27/2011	1/3/2012			0.027
1/3/2012	1/10/2012			0.023
1/10/2012	1/17/2012			0.032
1/17/2012	1/24/2012			0.024
1/24/2012	1/31/2012			0.027
1/31/2012	2/7/2012			0.026
2/7/2012	2/14/2012			0.026
2/14/2012	2/21/2012			0.029

Farley Air Particulate Split w/SN

(Results are pCi/m3)		State Data	Southern Nuclear Data
2/21/2012	2/28/2012		0.017
2/28/2012	3/6/2012		0.026
3/6/2012	3/13/2012		0.026
3/13/2012	3/20/2012		0.021
3/20/2012	3/27/2012		0.019
3/27/2012	4/3/2012		0.028
4/3/2012	4/10/2012		0.023
4/10/2012	4/17/2012		0.024
4/17/2012	4/24/2012		0.029
4/24/2012	5/1/2012		0.020
5/1/2012	5/8/2012		0.029
5/8/2012	5/15/2012		0.020
5/15/2012	5/22/2012		0.023
5/22/2012	5/29/2012		0.024
5/29/2012	6/5/2012		0.027
6/5/2012	6/12/2012		0.026
6/12/2012	6/19/2012		0.018
6/19/2012	6/26/2012		0.020
6/26/2012	7/3/2012		0.032
7/3/2012	7/10/2012		0.019
7/10/2012	7/17/2012		0.023
7/17/2012	7/24/2012		0.029
7/24/2012	7/31/2012		0.018
7/31/2012	8/7/2012		0.011
8/7/2012	8/14/2012		0.018
8/14/2012	8/21/2012		0.020
8/21/2012	8/28/2012		0.022
8/28/2012	9/4/2012		0.042
9/4/2012	9/11/2012		0.018
9/11/2012	9/18/2012		0.016
9/18/2012	9/25/2012		0.026

Farley Air Particulate Split w/SN

(Results are pCi/m3)		State Data	Southern Nuclear Data
9/25/2012	10/2/2012		0.027
10/2/2012	10/9/2012		0.033
10/9/2012	10/16/2012		0.020
10/16/2012	10/23/2012		0.027
10/23/2012	10/30/2012		0.023
10/30/2012	11/6/2012		0.027
11/6/2012	11/13/2012		0.032
11/13/2012	11/20/2012		0.028
11/20/2012	11/27/2012		0.035
11/27/2012	12/4/2012		0.030
12/4/2012	12/11/2012		0.030
12/11/2012	12/18/2012		0.018
12/18/2012	12/26/2012		0.021

Farley Nuclear Plant, Front Gate

Date On	Date Off	Sample ID	Gross Beta	Lic Gross Beta
12/27/2011	1/3/2012	78375	0.0289	0.029
1/3/2012	1/10/2012	78546	0.0227	0.023
1/10/2012	1/17/2012	78558	0.0270	0.031
1/17/2012	1/24/2012	78612	0.0278	0.021
1/24/2012	1/31/2012	78661	0.0224	0.027
1/31/2012	2/7/2012	78693	0.0242	0.024
2/7/2012	2/14/2012	78757	0.0419	0.025
2/14/2012	2/21/2012	78774	0.0198	0.017
2/21/2012	2/28/2012	78816	0.0216	0.018
2/28/2012	3/6/2012	78887	0.0188	0.019
3/6/2012	3/13/2012	78978	0.0213	0.019
3/13/2012	3/20/2012	79036	0.0183	0.017
3/20/2012	3/27/2012	79122	0.0188	0.021
3/27/2012	4/3/2012	79261	0.0257	0.021
4/3/2012	4/10/2012	79393	0.0202	0.019
4/10/2012	4/17/2012	79409	0.0298	0.022
4/17/2012	4/24/2012	79638	0.0255	0.028

Farley Air Particulate Split w/SN

(Results are pCi/m3)			State Data	Southern Nuclear Data
4/24/2012	5/1/2012	79680	0.0285	0.029
5/1/2012	5/8/2012	79797	0.0181	0.025
5/8/2012	5/15/2012	79943	0.0275	0.028
5/15/2012	5/22/2012	80064	0.0355	0.020
5/22/2012	5/29/2012	80112	0.0287	0.023
5/29/2012	6/5/2012	80163	0.0273	0.019
6/5/2012	6/11/2012	80308	0.0189	0.024
6/11/2012	6/19/2012	80492	0.0192	0.018
6/19/2012	6/26/2012	80557	0.0161	0.023
6/26/2012	7/3/2012	80623	0.0302	0.023
7/3/2012	7/10/2012	80688	0.0277	0.027
7/10/2012	7/17/2012	80894	0.0142	0.021
7/17/2012	7/24/2012	81004	0.0180	0.017
7/24/2012	7/31/2012	81155	0.0235	0.018
7/31/2012	8/7/2012	81187	0.0249	0.022
8/7/2012	8/14/2012	81353	0.0207	0.026
8/14/2012	8/21/2012	81420	0.0181	0.024
8/21/2012	8/28/2012	81591	0.0302	0.031
8/28/2012	9/4/2012	81594	0.0160	0.042
9/4/2012	9/11/2012	81740	0.0252	0.026
9/11/2012	9/18/2012	81863	0.0204	0.015
9/18/2012	9/25/2012	81951	0.0377	0.033
9/25/2012	10/2/2012	82035	0.0287	0.023
10/2/2012	10/9/2012	82217	0.0378	0.033
10/9/2012	10/16/2012	82435	0.0522	0.023
10/16/2012	10/23/2012	82513	0.0378	0.028
10/23/2012	10/30/2012	82582	0.0319	0.012
10/30/2012	11/6/2012	82729	0.0493	0.026
11/6/2012	11/13/2012	82850	0.0351	0.020
11/13/2012	11/19/2012	82889	0.0355	0.035
11/19/2012	11/27/2012	82937	0.0505	0.024

Farley Air Particulate Split w/SN

(Results are pCi/m3)

			State Data	Southern Nuclear Data
11/27/2012	12/4/2012	83106	0.0352	0.029
12/4/2012	12/11/2012	83163	0.0229	0.017
12/11/2012	12/18/2012	83250	0.0371	0.015
12/18/2012	12/26/2012	83263	0.0263	0.025

Farley Nuclear Plant, SSE

Date On	Date Off	Sample ID	Gross Beta	Lic Gross Beta
12/27/2011	1/3/2012	78374	0.0382	0.037
1/3/2012	1/10/2012	78545	0.0351	0.021
1/10/2012	1/17/2012	78557	0.0315	0.020
1/17/2012	1/24/2012	78611	0.0353	0.024
1/24/2012	1/31/2012	78660	0.0273	0.018
1/31/2012	2/7/2012	78692	0.0301	0.019
2/7/2012	2/14/2012	78756	0.0004	0.025
2/14/2012	2/21/2012	78773	0.0301	0.029
2/21/2012	2/28/2012	78815	0.0264	0.027
2/28/2012	3/6/2012	78886	0.0217	0.018
3/6/2012	3/13/2012	78977	0.0215	0.033
3/13/2012	3/20/2012	79035	0.0135	0.028
3/20/2012	3/27/2012	79121	0.0252	0.017
3/27/2012	4/3/2012	79260	0.0304	0.026
4/3/2012	4/10/2012	79392	0.0252	0.020
4/10/2012	4/17/2012	79408	0.0347	0.027
4/17/2012	4/24/2012	79637	0.0288	0.020
4/24/2012	5/1/2012	79679	0.0302	0.024
5/1/2012	5/8/2012	79796	0.0177	0.017
5/8/2012	5/15/2012	79942	0.0251	0.029
5/15/2012	5/22/2012	80063	0.0338	0.018
5/22/2012	5/29/2012	80111	0.0314	0.019
5/29/2012	6/5/2012	80162	0.0276	0.023
6/5/2012	6/11/2012	80307	0.0193	0.036
6/11/2012	6/19/2012	80491	0.0210	0.017
6/19/2012	6/26/2012	80556	0.0166	0.022

Farley Air Particulate Split w/SN

(Results are pCi/m3)			State Data	Southern Nuclear Data
6/26/2012	7/3/2012	80622	0.0326	0.020
7/3/2012	7/10/2012	80687	0.0271	0.032
7/10/2012	7/17/2012	80893	0.0132	0.016
7/17/2012	7/24/2012	81003	0.0177	0.029
7/24/2012	7/31/2012	81154	0.0201	0.025
7/31/2012	8/7/2012	81186	0.0238	0.022
8/7/2012	8/14/2012	81352	0.0195	0.027
8/14/2012	8/21/2012	81419	0.0180	0.027
8/21/2012	8/28/2012	81590	0.0277	0.026
8/28/2012	9/4/2012	81593	0.0154	0.038
9/4/2012	9/11/2012	81739	0.0243	0.013
9/11/2012	9/18/2012	81862	0.0211	0.022
9/18/2012	9/25/2012	81950	0.0391	0.025
9/25/2012	10/2/2012	82034	0.0274	0.046
10/2/2012	10/9/2012	82216	0.0388	0.030
10/9/2012	10/16/2012	82434	0.0567	0.017
10/16/2012	10/23/2012	82512	0.0386	0.014
10/23/2012	10/30/2012	82581	0.0350	0.024
10/30/2012	11/6/2012	82730	0.0548	0.013
11/6/2012	11/13/2012	82851	0.0327	0.026
11/13/2012	11/19/2012	82888	0.0350	0.035
11/19/2012	11/27/2012	82936	0.0501	0.020
11/27/2012	12/4/2012	83105	0.0407	0.021
12/4/2012	12/11/2012	83162	0.0267	0.031
12/11/2012	12/18/2012	83249	0.0358	0.019
12/18/2012	12/26/2012	83262	0.0292	0.026

Omussee STP, Dothan

Date On	Date Off	Sample ID	Gross Beta	Lic Gross Beta
1/1/2012	1/8/2012	78418	0.0374	
1/8/2012	1/22/2012	78617	0.0344	
1/22/2012	2/5/2012	78679	0.0274	
2/5/2012	2/19/2012	78771	0.0310	

Farley Air Particulate Split w/SN

(Results are pCi/m3)			State Data	Southern Nuclear Data
2/19/2012	3/4/2012	78822	0.0210	
3/4/2012	3/18/2012	79028	0.0243	
3/18/2012	4/1/2012	79149	0.0270	
4/1/2012	4/15/2012	79513	0.0293	
4/15/2012	4/29/2012	79667	0.0204	
4/29/2012	5/13/2012	79836	0.0196	
5/13/2012	5/27/2012	80109	0.0288	
5/27/2012	6/10/2012	80370	0.0196	
6/10/2012	6/24/2012	80555	0.0183	
6/24/2012	7/8/2012	80674	0.0225	
7/8/2012	7/22/2012	80892	0.0123	
7/22/2012	8/5/2012	81205	0.0207	
8/5/2012	8/19/2012	81415	0.0147	
8/19/2012	9/2/2012	81608	0.0165	
9/2/2012	9/16/2012	81749	0.0203	
9/16/2012	9/30/2012	82022	0.0258	
9/30/2012	10/14/2012	82438	0.0685	
10/14/2012	10/28/2012	82537	0.0622	
10/28/2012	11/11/2012	82853	0.0327	
11/11/2012	11/25/2012	83015	0.0664	
11/25/2012	12/9/2012	83137	0.0274	
12/9/2012	12/23/2012	83257	0.0256	

Farley Radioiodine

State Data (Results are pCi/m3) Southern Nuclear Data

Dothan, SN, Control

Sample ID	Date Off	Date of Analysis	I-131 Activity	Lic Collection Date	Lic I-131 Activity
	1/3/2012			1/3/2012	<0.0700
	2/7/2012			2/7/2012	<0.0700
	3/6/2012			3/6/2012	<0.0700
	4/3/2012			4/3/2012	<0.0700
	5/1/2012			5/1/2012	<0.0700
	6/5/2012			6/5/2012	<0.0700
	7/3/2012			7/3/2012	<0.0700
	8/7/2012			8/7/2012	<0.0700
	9/4/2012			9/4/2012	<0.0700
	10/2/2012			10/2/2012	<0.0700
	11/6/2012			11/6/2012	<0.0700
	12/4/2012			12/4/2012	<0.0700

Farley NP Front Gate

Sample ID	Date Off	Date of Analysis	I-131 Activity	Lic Collection Date	Lic I-131 Activity
78377	1/3/2012	1/10/2012	<0.0700	1/3/2012	<0.0700
78695	2/7/2012	2/14/2012	<0.0700	2/7/2012	<0.0700
78889	3/6/2012	3/19/2012	<0.0700	3/6/2012	<0.0700
79263	4/3/2012	4/16/2012	<0.0700	4/3/2012	<0.0700
79682	5/1/2012	5/9/2012	<0.0700	5/1/2012	<0.0700
80165	6/5/2012	6/11/2012	<0.0700	6/5/2012	<0.0700
80625	7/3/2012	7/10/2012	<0.0700	7/3/2012	<0.0700
81189	8/7/2012	8/10/2012	<0.0700	8/7/2012	<0.0700
81596	9/4/2012	9/11/2012	<0.0700	9/4/2012	<0.0700
82037	10/2/2012	10/9/2012	<0.0700	10/2/2012	<0.0700
82732	11/6/2012	11/15/2012	<0.0700	11/6/2012	<0.0700
83108	12/4/2012	12/13/2012	<0.0700	12/4/2012	<0.0700

Omussee Creek STP

Sample ID	Date Off	Date of Analysis	I-131 Activity	Lic Collection Date	Lic I-131 Activity
78419	1/8/2012	1/13/2012	<0.0700		
78823	3/4/2012	3/8/2012	<0.0700		

Farley Radioiodine

State Data	(Results are pCi/m3)		Southern Nuclear Data
79150	4/1/2012	4/10/2012	<0.0700
79640	4/29/2012	5/7/2012	<0.0700
80114	5/27/2012	6/6/2012	<0.0700
80672	7/8/2012	7/31/2012	<0.0700
81603	9/2/2012	9/12/2012	<0.0700
82033	9/30/2012	10/9/2012	<0.0700
82535	10/28/2012	11/6/2012	<0.0700
83024	11/25/2012	12/5/2012	<0.0700
83256	12/23/2012	1/7/2013	<0.0700

Farley Nuclear Waterborne

State Data (Results are pCi/L)

Station	Collection Date	Sample ID	Analysis Date	Gross Alpha	% Error	Gross Beta	% Error	K 40
Down Stream, Farley NP								
	1/5/2012	78385	1/17/2012	<MDL	0	5.33	0	<MDL
	4/10/2012	79272	4/30/2012	1.10	0.62	7.61	0.24	<MDL
	7/5/2012	80646	8/10/2012	1.18	0.71	4.18	0.49	<MDL
	10/2/2012	82020	10/22/2012	1.31	0.52	4.64	0.32	<MDL
Up Stream, Farley NPP								
	1/5/2012	78384	1/17/2012	1.25	0.68	6.21	0.31	<MDL
	4/10/2012	79271	4/30/2012	<MDL	0	4.95	0.33	<MDL
	7/5/2012	80645	8/10/2012	1.41	0	5.45	0	<MDL
	10/2/2012	82019	10/22/2012	1.40	0.49	4.89	0.31	<MDL

Farley Nuclear Waterborne Split w/SN

(Results are pCi/L)

Background, WRB-M5, Farley NPP, SN

Sample ID	Collection Date	Analysis Date	Gross Alpha	% Error	Gross Beta	% Error	K 40
78609	1/24/2012	2/23/2012	1.13	0.60	4.07	0.43	<MDL
78768	2/21/2012	3/30/2012	0	0	4.49	0.39	<MDL
79033	3/20/2012	3/30/2012	0	0	5.57	0.31	<MDL
79400	4/17/2012	4/30/2012	<MDL	0	5.72	0.31	<MDL
79940	5/15/2012	6/27/2012	1.13	0.60	5.08	0.32	<MDL
80305	6/11/2012	7/10/2012	3.35	0	6.50	0	<MDL
80685	7/10/2012	8/10/2012	1.54	0.58	5.72	0.38	<MDL
81184	8/7/2012	10/1/2012	2.34	0.43	9.68	0.26	<MDL
81597	9/4/2012	10/19/2012	<MDL	0	4.99	0.29	<MDL
82041	10/2/2012	10/22/2012	1.18	0.43	3.58	0.39	<MDL
82579	10/30/2012	11/13/2012	<MDL	0	3.59	0.42	<MDL
82944	11/27/2012	12/19/2012	<MDL	0	6.35	0.26	<MDL
83260	12/26/2012	1/23/2013	<MDL	0	6.29	0.25	<MDL

Indicator, WRI-M5, Farley NPP, SN

Sample ID	Collection Date	Analysis Date	Gross Alpha	% Error	Gross Beta	% Error	K 40
78610	1/24/2012	2/23/2012	<MDL	0	4.73	0.38	<MDL
78769	2/21/2012	3/30/2012	1.01	0.84	3.47	0.49	<MDL
79034	3/20/2012	3/30/2012	1.83	0.42	5.18	0.33	<MDL
79401	4/17/2012	4/30/2012	1.79	0.50	5.37	0.33	<MDL
79941	5/15/2012	6/27/2012	1.29	0	8.97	0	105.0
80306	6/11/2012	7/10/2012	2.87	0.31	8.99	0.25	<MDL
80686	7/10/2012	8/10/2012	1.44	0.54	4.50	0.40	<MDL
81185	8/7/2012	10/1/2012	1.67	0.57	4.94	0.45	72.10
81598	9/4/2012	10/19/2012	1.13	0.67	3.51	0.38	<MDL
82042	10/2/2012	10/22/2012	<MDL	0	3.39	0.41	<MDL
82580	10/30/2012	11/15/2012	<MDL	0	2.66	0	<MDL
82945	11/27/2012	12/20/2012	2.21	0.36	4.60	0.33	<MDL
83261	12/26/2012	1/23/2013	1.04	0.63	6.16	0.26	<MDL

Farley Vegetation Samples

State Samples

Station	Collection Date	Sample ID	Analysis Date	K-40 (pCi/g)	Other Isotope (pCi/g)
Farley North					
	1/5/2012	78381	1/12/2012	20.5	<MDL
	4/10/2012	79268	4/27/2012	1.18	<MDL
	7/5/2012	80642	8/13/2012	0	<MDL
	10/2/2012	82016	10/15/2012	0	<MDL
Farley South					
	1/5/2012	78383	1/17/2012	41	<MDL
	4/11/2012	79270	4/30/2012	24.3	Cs-137 0.035
	7/5/2012	80644	8/14/2012	0	<MDL
	10/2/2012	82018	10/16/2012	0	<MDL
Farley West					
	1/5/2012	78382	1/13/2012	45.6	<MDL
	4/10/2012	79269	4/30/2012	15.5	<MDL
	7/5/2012	80643	8/14/2012	0	<MDL
	10/2/2012	82017	10/16/2012	0	<MDL

Farley Vegetation Split Sample

Station	Sample ID	Analysis Date	K-40(pCi/g)	Other Isotope(pCi/g)	Lic's K40(pCi/g)	Lic's Other Isotope(pCi/g)
Farley Control Station, FI 1218						
	79302	5/10/2012	14.6	Cs-137 0.041	3.371	Be-7 1.62
	82040	10/22/2012	11.4	<MDL	4.115	Be-7 2.48
Farley North Boundary,FI 1601						
	79301	5/9/2012	8.34	<MDL	4.684	Be-7 0.76
	82039	10/22/2012	7.96	<MDL	2.786	Be-7 2.50
Farley South Boundary, FI 070						
	79300	5/9/2012	27.9	<MDL	3.893	Be-7 0.78
	82038	10/18/2012	11.9	<MDL	1.913	Be-7 2.54

Farley Split Fish Samples w/SN

State Analysis (Results are pCi/g) SN Analysis

Background Bottom Feeding; Farley

Sample ID	Collection Date	Analysis Date	K-40	Other Isotope	Lic K-40	Lic Other Isotope
79208	4/3/2012	6/13/2012	0	<MDL	3.76	<MDL
82056	10/2/2012	11/6/2012	36.90	<MDL	3.72	<MDL

Background Game Fish ; Farley

Sample ID	Collection Date	Analysis Date	K-40	Other Isotope	Lic K-40	Lic Other Isotope
79207	4/3/2012	6/13/2012	3.57	<MDL	3.45	<MDL
82055	10/2/2012	11/6/2012	39.1	<MDL	3.40	<MDL

Indicator Bottom Feeding; Farley

Sample ID	Collection Date	Analysis Date	K-40	Other Isotope	Lic K-40	Lic Other Isotope
79206	4/4/2012	5/11/2012	3.58	<MDL	3.33	<MDL
82054	10/2/2012	11/1/2012	3.12	<MDL	3.35	<MDL

Indicator Game Fish; Farley

Sample ID	Collection Date	Analysis Date	K-40	Other Isotope	Lic K-40	Lic Other Isotope
79205	4/4/2012	5/10/2012	3.61	Cs137 .022	3.60	CS137 .016
82053	10/2/2012	11/1/2012	4.41	<MDL	3.68	Cs137 .013

Sediment Samples Split w/SN

(Results are pCi/g)

Ch. River Sediment, Background

Sample ID	Collection Date	Analysis Date	K-40	Lic K40
79209	4/3/2012	5/22/2012	5.68	4.17

Ch. River Sediment, Indicator

Sample ID	Collection Date	Analysis Date	K-40	Lic K40
79210	4/4/2012	6/19/2012	2.34	2.02

Alabama TLD Data for Farley NPP

Location	Quarter	mRem/Qtr
39-Hwy 431/Headland		
15.0 Mi @ 293	1st	20
	2nd	21
	3rd	23
	4th	19
40-Hwy 431/Co Rd 105		
15.0 Mi @ 289	1st	16
	2nd	17
	3rd	21
	4th	17
41-Webb		
10.0 Mi @ 284	1st	21
	2nd	19
	3rd	23
	4th	23
42-Hwy 52 & Co Rd 75		
4.6 Mi @ 315	1st	18
	2nd	18
	3rd	23
	4th	19
43-Hwy 52		
4.3 Mi @332	1st	16
	2nd	18
	3rd	21
	4th	20
44-Columbia		
4.8 Mi @ 251	1st	17
	2nd	18
	3rd	21
	4th	17

Location	Quarter	mRem/Qtr
45-Damsite Rd Pwr Pole		
1.3 Mi @ 360	1st	18
	2nd	17
	3rd	21
	4th	19
46-Damsite Rd @ PIC		
1.1 Mi @ 357	1st	20
	2nd	18
	3rd	22
	4th	22
47-Damsite Rd @ Left Turn		
1.3 Mi @ 013	1st	23
	2nd	24
	3rd	28
	4th	25
48-Hwy 95 Pwr Pole		
1.0 Mi @ 316	1st	19
	2nd	21
	3rd	22
	4th	22
49-Hwy 95 @ Cut Off Poles		
0.9 Mi @ 330	1st	21
	2nd	20
	3rd	24
	4th	22
50-Nuclear Plant Rd		
1.6 Mi @ 261	1st	18
	2nd	17
	3rd	24
	4th	19

Alabama TLD Data for Farley NPP

Location	Quarter	mRem/Qtr
51-Farley Plant Ft Gate		
0.9 Mi @ 252	1st	18
	2nd	18
	3rd	22
	4th	20
52-Whatley Farm		
1.2 Mi @ 220	1st	18
	2nd	17
	3rd	20
	4th	19
53-Lamp Bro Rd & Hwy 95		
1.8 Mi @ 200	1st	19
	2nd	20
	3rd	22
	4th	20
54-Cedar Creek & Hwy 95		
2.4 Mi @ 191	1st	21
	2nd	20
	3rd	25
	4th	20
55-Gordon @ Marsh Residence		
5.2 Mi @ 169	1st	18
	2nd	18
	3rd	22
	4th	20
56-Gordon Landing		
5.6 Mi @ 155	1st	27
	2nd	18
	3rd	27
	4th	20

Location	Quarter	mRem/Qtr
57-855 Green Frog Rd		
4.5 Mi @ 197	1st	18
	2nd	19
	3rd	23
	4th	18
58-Pansey (Hwy84 &60)		
6.1 Mi @ 216	1st	18
	2nd	19
	3rd	22
	4th	20
59-Union Spring Church		
3.2 Mi @ 230	1st	19
	2nd	18
	3rd	21
	4th	21
60-Co Rd 75 & East Cook Rd		
3.5 Mi @ 251	1st	20
	2nd	19
	3rd	23
	4th	23
61-Co Rd 75 & Co Rd 33		
3.8 Mi @ 295	1st	19
	2nd	19
	3rd	22
	4th	17
62-Oaky Grove Church		
4.5 Mi @ 267	1st	23
	2nd	21
	3rd	21
	4th	22

Alabama TLD Data for Farley NPP

Location	Quarter	mRem/Qtr	Location	Quarter	mRem/Qtr
63-Ashford					
7.8 Mi @ 252	1st	21			
	2nd	18			
	3rd	23			
	4th	21			
64-Dothan					
15.0 Mi @ 268	1st	18			
	2nd	18			
	3rd	21			
	4th	18			

Southern Nuclear TLD Data for Farley NPP

Location	Quarter	mRem/Qtr
B0215A		
15 Miles NE	1st	20.5
	2nd	19.6
	3rd	15.9
	4th	17.6
B0718A		
18 Miles SSE	1st	18.2
	2nd	17.6
	3rd	14.5
	4th	13.3
B1215A		
15 Miles West	1st	14.7
	2nd	14.2
	3rd	13.4
	4th	16.8
B1218A		
18 Miles West	1st	16.1
	2nd	15.9
	3rd	14.0
	4th	17.3
B1311A		
11 Mles WNW	1st	18.6
	2nd	17.4
	3rd	15.5
	4th	16.8
B1612A		
12 Miles North	1st	14.7
	2nd	12.5
	3rd	11.1
	4th	13.0

Location	Quarter	mRem/Qtr
C0104A		
Four Miles NNE	1st	15.6
	2nd	14.2
	3rd	12.5
	4th	12.9
C0204A		
Four Miles NE	1st	15.9
	2nd	14.0
	3rd	12.7
	4th	13.1
C0304A		
Four Miles ENE	1st	16.0
	2nd	14.2
	3rd	14.9
	4th	13.8
C0405A		
Five Miles East	1st	17.4
	2nd	15.3
	3rd	13.3
	4th	15.6
C0505A		
Five Miles ESE	1st	15.4
	2nd	14.6
	3rd	13.3
	4th	13.2
C0605A		
Five Miles SE	1st	14.2
	2nd	13.4
	3rd	13.0
	4th	13.5

Southern Nuclear TLD Data for Farley NPP

Location	Quarter	mRem/Qtr	Location	Quarter	mRem/Qtr
C0703A			**C1108A**		
Three Miles SSE	1st	18.4	Eight Miles WSW	1st	14.8
	2nd	17.6		2nd	12.8
	3rd	15.9		3rd	11.0
	4th	17.6		4th	16.8
C0805A			**C1204A**		
Five Miles South	1st	14.7	Four Miles West	1st	18.6
	2nd	15.6		2nd	17.5
	3rd	13.2		3rd	15.1
	4th	12.7		4th	15.5
C0904A			**C1304A**		
Four Miles SSW	1st	16.5	Four Miles WNW	1st	18.3
	2nd	16.2		2nd	15.4
	3rd	13.5		3rd	13.9
	4th	15.4		4th	14.7
C1001A			**C1404A**		
One Mile SW	1st	13.6	Four Miles NW	1st	18.4
	2nd	13.3		2nd	17.1
	3rd	10.8		3rd	13.9
	4th	11.8		4th	15.2
C1005A			**C1504A**		
Five Miles SW	1st	17.2	Four Miles NNW	1st	14.4
	2nd	15.6		2nd	13.6
	3rd	14.1		3rd	12.7
	4th	14.3		4th	13.0
C1104A			**C1605A**		
Four Miles WSW	1st	15.8	Five Miles North	1st	14.6
	2nd	15.7		2nd	13.4
	3rd	14.4		3rd	11.8
	4th	14.3		4th	13.0

Southern Nuclear TLD Data for Farley NPP

Location	Quarter	mRem/Qtr	Location	Quarter	mRem/Qtr
lo101A			**lo701A**		
One Mile NNE	1st	18.2	One Mile SSE	1st	19.0
	2nd	17.5		2nd	17.5
	3rd	14.0		3rd	15.8
	4th	16.9		4th	17.6
lo201A			**lo801A**		
One Mile NE	1st	24.4	One Mile South	1st	14.4
	2nd	24.6		2nd	14.0
	3rd	22.2		3rd	13.1
	4th	23.6		4th	13.2
lo301A			**lo901A**		
One Mile ENE	1st	16.6	One Mile SSW	1st	18.0
	2nd	16.6		2nd	18.0
	3rd	12.8		3rd	13.6
	4th	15.1		4th	15.7
lo401A			**l1001A**		
One Mile East	1st	26.5	One Mile SW	1st	17.1
	2nd	26.0		2nd	18.1
	3rd	23.7		3rd	15.4
	4th	23.6		4th	15.3
lo501A			**l1101A**		
One Mile ESE	1st	20.0	One Mile WSW	1st	17.1
	2nd	19.8		2nd	15.9
	3rd	16.6		3rd	16.4
	4th	17.9		4th	16.0
lo601A			**l1201A**		
One Mile SE	1st	16.8	One Mile West	1st	18.7
	2nd	16.0		2nd	16.1
	3rd	13.8		3rd	12.6
	4th	14.6		4th	16.9

Southern Nuclear TLD Data for Farley NPP

Location	Quarter	mRem/Qtr	Location	Quarter	mRem/Qtr
I1301A					
One Mile WNW	1st	16.8			
	2nd	15.3			
	3rd	19.1			
	4th	16.1			
I1401A					
One Mile NW	1st	20.5			
	2nd	18.3			
	3rd	14.9			
	4th	19.6			
I1501A					
One Mile NNW	1st	17.0			
	2nd	17.7			
	3rd	13.4			
	4th	16.4			
I1601A					
One Mile North	1st	16.4			
	2nd	16.5			
	3rd	12.5			
	4th	15.8			

VII. BELLEFONTE NUCLEAR PLANT:

TVA currently has the ***Bellefonte Nuclear Plant*** (BNP) in a caretaker status. This facility is located in Jackson, County approximately six miles northeast of Scottsboro, Alabama (Population 14,879). The plant is located on a peninsula bounded on the west by the Town Creek embayment and on the east by Guntersville Reservoir. This site is on the north shore of the Tennessee River at TRM 391.5.

The original plant design has two PWR units each rated at 3,620 megawatts thermal and 1,271 megawatts electrical. The future use of Bellefonte is being studied. TVA has filed a combined operating license to NRC and FEMA. This license will allow construction to begin for PWR units that meet current AP1000 design. The operating license may take a few years to approve. Construction would take 6 to 10 years.

The current AREMP network for Bellefonte presently consists of one water sampling station at the Scottsboro Water Treatment Plant. One water sample is collected for EPA. These samples are collected quarterly to establish a statistical baseline of background radiation levels.

Future monitoring will include TLDs, PICs, and additional surface water sampling stations, air sampling stations, vegetation sampling stations, and milk sampling stations. These sampling sites will be surveyed and stationed prior to initial reactor criticality.

Analyses of the 2012 background water surveillance for the Bellefonte Nuclear Plant are presented in the following exhibit.

Bellefonte Nuclear Plant near Scottsboro, AL

Bellefonte Nuclear Power Plant Water Samples

State Data

(Results are pCi/L)

Scottsboro WTP, Bellefonte NPP

Sample ID	Collection Date	Analysis Date	Gross Alpha	% Error	Gross Beta	% Error	K 40
78478	1/11/2012	1/27/2012	1.88	0.44	5.72	0.29	<MDL
79191	4/4/2012	4/24/2012	1.26	0.65	4.44	0.04	<MDL
80753	7/11/2012	8/10/2012	1.43	0.59	3.97	0.47	<MDL
82136	10/10/2012	11/1/2012	1.37	0	2.78	0	<MDL

VIII. SPECIAL EVALUATION PROGRAMS:

The State of Alabama monitors the liquid discharge of three commercial facilities for the presence of radioisotopes. These facilities are ***Eastern Technologies, Inc.*** (ETI), ***Saint-Gobain***, and ***Wyle Laboratories***. Environmental sample analyses show that no radionuclide concentrations were above the Radiation Regulations of the Alabama Department of Public Health during 2012.

A. Eastern Technologies, Inc. (ETI):

ETI is located in Ashford, Alabama. The company operates a nuclear laundry to clean garments worn by certain employees in nuclear related industries. Water samples and thermo luminescent dosimeters are collected and analyzed through AREMP. The facility became operational in February of 1993. AREMP collects a 10 ml water sample per 1000 gallons of discharge for laboratory analysis. Samples are analyzed and compared with ETI results.

During 2012, the Office of Radiation Control secured a total of 12 water samples from the discharge from ETI. This "nuclear laundry" routinely discharges waste water into the city sewage system. This water is constantly monitored by the company and the state for radiological contamination. The samples collected are used to evaluate the level of contamination discharged and to insure that state limitations are not exceeded.

B. Ashford Sewage Lagoons

Because of industrial discharges directly into the sanitary sewage system of Ashford, Alabama, sampling of the city's settlement pond and polishing ponds has been a part of AREMP since 1996. An annual collection of sediment samples from these sewage lagoons was completed during November 2012. The results from the sediment samples from the receiving lagoons and the point of discharge into Mill Creek are contained in the data following the water reports from ETI.

Eastern Technologies, Inc.

Waste Water Releases in pCi/L

Sample ID	Collected	Analyzed	Cs-134	Cs-137	Co-58	Co-60	Mn-54	K-40	Zn-65
78386	1/5/2012	1/18/2012	60.7	304.0	90.90	1000	61.30	<MDL	<MDL
78691	2/7/2012	2/23/2012	55.60	364.0	47.70	969.0	74.50	<MDL	40.50
78818	3/2/2012	3/30/2012	<MDL	287.0	159.0	674.0	120.0	<MDL	13.10
79273	4/11/2012	4/30/2012	0	248.0	118.0	967.0	117.0	44.50	30.50
79772	5/8/2012	6/19/2012	<MDL	158.0	254.0	1310.0	133.0	<MDL	123.0
80119	6/1/2012	6/28/2012	20.30	424.0	340.0	713.0	61.0	<MDL	65.10
80593	7/2/2012	8/1/2012	15.5	389.0	17.3	975.0	77.7	<MDL	23.5
81610	9/6/2012	10/19/2012	12.4	327.0	20.6	367.0	24.3	40.8	23.4
82021	10/2/2012	10/22/2012	<MDL	230.0	128.0	437.0	48.30	47.9	101.0
82433	10/19/2012	11/13/2012	<MDL	260.0	34.20	436.0	39.80	40.30	113.0
82855	11/15/2012	12/13/2012	11.5	231.0	1030.0	735.0	62.30	52.70	111.0
83237	12/19/2012	1/25/2013	27.00	214.0	1550.0	318.0	30.40	<MDL	<MDL

TLD Data for Eastern Technologies

Quarter	mRem/Qtr
65- Ashford STP on S End of Fence Line	
1st	18
2nd	18
3rd	21
4th	19
66- Ashford STP on SW on Fence Line	
1st	20
2nd	19
3rd	22
4th	20
67- Ashford STP on NW on Fence Line	
1st	20
2nd	18
3rd	19
4th	18
68- Ashford STP on N End of Fence Line	
1st	19
2nd	18
3rd	19
4th	18
69-ETI Main Plant West Fence	
1st	22
2nd	20
3rd	25
4th	25
70-ETI Main Plant South Fence	
1st	25
2nd	21
3rd	21
4th	22

Quarter	mRem/Qtr
71-ETI Main Plant SW Fence	
1st	23
2nd	22
3rd	22
4th	22
72-ETI Main Plant NW Fence	
1st	27
2nd	25
3rd	28
4th	24
73-ETI Main Plant North Fence	
1st	24
2nd	22
3rd	23
4th	22
74- ETI Main Plant NE Fence	
1st	29
2nd	32
3rd	28
4th	26
75-ETI Maint Yd, ENE Fence	
1st	30
2nd	26
3rd	27
4th	27
76-ETI Maint Yd, ESE Fence	
1st	30
2nd	22
3rd	25
4th	23

TLD Data for Eastern Technologies

77-ETI Maint Yd, SSE Fence

Quarter	mRem/Qtr
1st	32
2nd	24
3rd	29
4th	28

78-ETI Maint Yd, S Fence

Quarter	mRem/Qtr
1st	26
2nd	22
3rd	22
4th	22

79-ETI Maint Yd, SW Fence

Quarter	mRem/Qtr
1st	25
2nd	21
3rd	25
4th	22

80-ETI Maint Yd, WNW Fence

Quarter	mRem/Qtr
1st	25
2nd	23
3rd	28
4th	24

81-ETI Maint Yd, NNW Fence

Quarter	mRem/Qtr
1st	25
2nd	24
3rd	21
4th	22

82-ETI Maint Yd, NE Fence

Quarter	mRem/Qtr
1st	20
2nd	19
3rd	21
4th	21

83-ETI Maint Yd, E Fence

Quarter	mRem/Qtr
1st	26
2nd	20
3rd	21
4th	30

84-ETI Maint Yd, Out Side on Lean Too

Quarter	mRem/Qtr
1st	28
2nd	23
3rd	26
4th	26

85-ETI Main Plant, SSW Fence

Quarter	mRem/Qtr
1st	19
2nd	19
3rd	20
4th	21

THERMOLUMINESCENT RECOVERY FOR 2012

DOSES(millirems) per (QUARTER)

TLD #	03/31/2012	06/30/2012	09/30/2012	12/31/2012	Yearly Total
State TLD 69	22	20	25	25	92
ETI #ACS 3	21	21	23	24	89
State TLD 70	25	21	21	22	89
ETI #ACS 5	21	19	18	21	79
State TLD 71	23	22	22	22	89
State TLD 72	27	25	28	24	104
ETI #ACS 6	25	21	25	24	95
State TLD 73	24	22	23	22	91
ETI #ACS 8	21	20	25	22	88
State TLD 74	29	32	28	26	115
ETI #ACS 11	26	25	25	28	104
State TLD 75	30	26	27	27	110
ETI #ACS 12	30	30	25	25	110
State TLD 76	30	22	25	23	100
ETI Maint #9	23	23	25	28	99
State TLD 77	32	24	29	28	113
ETI Maint # 01	29	23	26	25	103
State TLD 78	26	22	22	22	92
ETI Maint # 02	24	23	21	22	90
State TLD 79	25	21	25	22	93
ETI Maint # 03	17	19	23	24	83
State TLD 80	25	23	28	24	100
ETI Maint # 04	23	20	24	23	90
State TLD 81	25	24	21	22	92
ETI Maint # 05	20	20	20	22	82
State TLD 82	20	19	21	21	81
ETI Maint # 06	17	19	21	19	76
State TLD 83	26	20	21	30	97
ETI Maint # 07	22	18	18	29	87
State TLD 84	28	23	26	26	103
ETI Maint # 08	23	23	24	27	97
State TLD 85	19	19	20	21	79
ETI Maint # 11	24	20	23	25	92

*Data Includes Background Radiation

Sediment Ashford Sewage Lagoons

(Results are pCi/g)

East Side, Main Pool

Sample ID	Collection Date	Analysis Date	Cs-137	Co-58	Co-60	Fe-59	Mn-54	K-40	Zn-65
82897	11/28/2012	12/6/2012	3.16	0	28	0	0.189	0	0

Final Pool, East

Sample ID	Collection Date	Analysis Date	Cs-137	Co-58	Co-60	Fe-59	Mn-54	K-40	Zn-65
82900	11/28/2012	12/13/2012	1.41	0	1.05	0	0.138	0	0

Middle Pool, West

Sample ID	Collection Date	Analysis Date	Cs-137	Co-58	Co-60	Fe-59	Mn-54	K-40	Zn-65
82899	11/28/2012	12/11/2012	0.932	0	1.45	0	0	0	0

North Side, Main Pool

Sample ID	Collection Date	Analysis Date	Cs-137	Co-58	Co-60	Fe-59	Mn-54	K-40	Zn-65
82896	11/28/2012	12/10/2012	2.65	0	19.1	0	0.102	0	0

Outfall, Mill Creek

Sample ID	Collection Date	Analysis Date	Cs-137	Co-58	Co-60	Fe-59	Mn-54	K-40	Zn-65
82901	11/28/2012	12/14/2012	0	0	0.569	0	0.152	0	0

South Side, Main Pool

Sample ID	Collection Date	Analysis Date	Cs-137	Co-58	Co-60	Fe-59	Mn-54	K-40	Zn-65
82898	11/28/2012	12/10/2012	0.655	0	5.84	0	0.061	0	0

West Side, Main Pool

Sample ID	Collection Date	Analysis Date	Cs-137	Co-58	Co-60	Fe-59	Mn-54	K-40	Zn-65
82895	11/28/2012	12/4/2012	2.07	0	20.6	0	0.167	0	0

C. Saint-Gobain:

Saint-Gobain is located in Madison County near Huntsville, Alabama. The company manufactures abrasives for industrial use. Baddeleyite ore, which contains thorium and uranium, is used to manufacture a crude refractory material. The residue from these materials is transferred to a settling pond from dust collectors in a furnace and crushing system. Discharge water from this pond flows from the company property to the Tennessee River. AREMP samples this runoff on a quarterly basis.

D. Wyle Laboratories:

Wyle Laboratories is also located in Madison County near Huntsville, Alabama. The company tests, inspects, and repairs various components from nuclear plant piping systems. Liquid wastes from cleaning, testing, and chemical decontamination of these components may become slightly contaminated with radio nuclides. The high pressure steam used to pressure test components may also become slightly contaminated. This steam is piped to an exhaust condenser in a radiological treatment area and then piped as water to a contamination holding tank. These wastes are filtered and then treated by an ion exchange. The processed waste is then released into a stream, flows into Indian Creek, and eventually empties into the Tennessee River. AREMP samples this runoff quarterly from Indian Creek.

Saint Gobain and Wyle Discharge Sample

State Data (Results are pCi/L

Saint Gobain

Sample ID	Collection Date	Analysis Date	Gross Alpha	% Error	Gross Beta	% Error	K 40
78480	1/11/2012	1/27/2012	2.14	0.4	4.56	0.43	<MDL
79193	4/4/2012	4/24/2012	1.07	0.19	3.11	0.52	<MDL
80755	7/11/2012	8/20/2012	2.07	0	5.41	0	40.30
82138	10/10/2012	11/1/2012	1.49	0.45	3.39	0.39	<MDL

Wyle Labs @ Indian Creek

Sample ID	Collection Date	Analysis Date	Gross Alpha	% Error	Gross Beta	% Error	K 40
78481	1/11/2012	1/27/2012	5.58	0.23	8.90	0.23	<MDL
79194	4/4/2012	4/24/2012	1.22	0	2.70	0	<MDL
80756	7/11/2012	8/20/2012	3.11	0.34	8.05	0.27	<MDL
82139	10/10/2012	11/1/2012	<MDL	0	4.79	0.31	47.03

IX. EMERGENCY ENVIRONMENTAL MONITORING:

The Alabama Department of Public Health is responsible for assessing radiological emergencies (including the offsite consequences of nuclear power plant accidents). Monitoring teams play an important role in this assessment. The teams would be deployed to collect radiological environmental data for the Office of Radiation Control.

Environmental monitoring around the two operating nuclear plants is performed by both county and state monitoring teams. Direct gamma readings are made using Geiger-Muller surveying instruments. Portable air monitors sample particulates with glass fiber particulate filters. Radioiodine is sampled for with silver-zeolite cartridges.

Determination of radioiodine concentrations in air and milk is a very important health concern. Significant quantities of radioiodine can concentrate in the thyroid through inhalation of air and ingestion of milk.

The United States ***Food and Drug Administration*** (FDA) ***Protective Action Level*** (PAL) for radioiodine in milk is 15,000 pCi/l. Analytical laboratory procedures yield an LLD of 20 pCi/l. In emergency situations, these procedures can be modified to provide faster analysis and accommodate more samples. The reduction in counting time provides 20 minute sample turnaround with lower detection limits of approximately 70 pCi/l (still well below the FDA PAL).

Following the emergency phase of a radiological accident, extensive monitoring may be needed to assess soil deposits and the need for relocation or return of previously evacuated citizens. Long term ingestion of contaminated food crops may be avoided by comprehensive monitoring of all food production and water pathways.

APPENDIX

APPENDIX I

State of Alabama

Detection Capabilities of Environmental Samples

Nominal Lower Limits of Detection (LLD & MDL)

State of Alabama							
Isotope Analysis	Airborne Particulates (pCi/m3)	Charcoal (PCi/m3)	Water & Milk (pCi/l)	Vegetation Dry (pCi/g)	Sediment Dry (pCi/g)	Fish Dry (pCi/g)	Food (pCi/g)
Alpha	0.01		1.0				
Beta	0.001		2.0				
H-3			330				
K-40			100.0	0.5	0.5	0.5	0.5
MN-54			8.0	0.06	0.06	0.06	0.06
CO-58			8.0	0.06	0.06	0.06	0.06
FE-59			15.0	0.15	0.15	0.15	0.15
CO-60			8.0	0.06	0.06	0.06	0.06
ZN-65			15.0	0.07	0.07	0.07	0.07
RU-106			75.0	0.35	0.35	0.35	0.35
I-131		0.07	5.0	0.06	0.06	0.06	0.06
CS-134			8.0	0.15	0.15	0.15	0.15
CS-137			8.0	0.02	0.02	0.02	0.02
BA-140				0.5	0.5	0.5	0.5
LA-140			15.0				

APPENDIX II

Tennessee Valley Authority (TVA)
Detection Capabilities of Environmental Samples
Nominal Lower Limits of Detection (LLD)

Isotope Analysis	Airborne Particulate (pCi//m^3)	Charcoal (pCi//m^3)	Water (pCi/l)	Milk (pCi/l)	Vegetation Dry (pCi/g)	Vegetation Wet (pCi/g)	Sediment Dry (pCi/g)	Fish Dry (pCi/g)	Food (pCi/kg)
Alpha	0.0007		1.5		0.05				
Beta	0.0020		1.9						
H-3			270						
Be-7	0.0200	0.15	45	45	0.25	0.200	0.250	0.25	90
K-40	0.0400	0.30	100	100	0.40	0.400	0.750	0.40	250
Cr-51	0.0020	0.15	45	45	.030	0.200	0.350	0.30	95
Mn-54	0.0050	0.02	5	5	.003	0.020	0.030	0.03	10
Co-58	0.0050	0.02	5	5	.003	0.020	0.030	0.03	10
Fe-59	0.0050	0.04	10	10	0.08	0.040	0.050	0.08	25
Co-60	0.0050	0.02	5	5	0.03	0.020	0.030	0.03	10
Zn-65	0.0050	0.03	10	10	0.05	0.045	0.050	0.05	45
Nb-95	0.0050	0.02	5	5	0.25	0.030	0.040	0.25	10
Zr-95	0.0050	0.03	10	10	0.05	0.045	0.050	0.05	45
Ru-103	0.0050	0.02	5	5	0.03	0.025	0.030	0.03	25
Ru-106	0.0200	0.12	40	40	0.15	0.190	0.200	0.15	90
I-131	0.0050	0.03	0.4	0.4	0.20	0.060	0.025	0.20	20
Cs-134	0.0050	0.02	5	5	0.03	0.030	0.030	0.03	10
Cs-137	0.0050	0.02	5	5	0.03	0.025	0.030	0.03	10
Ba-140	0.0150	0.07	25	25	.030	0.130	0.030	0.30	50
La-140	0.0100	0.04	10	10	0.20	0.050	0.200	0.20	25
Ce-141	0.0050	0.02	10	10	0.07	0.035	0.100	0.07	20
Ce-144	0.0100	0.07	30	30	0.15	0.115	0.200	0.15	60
Tl-208	0.0020	0.02	10	10	0.03	0.030	0.060	0.03	30
Bi-212	0.0200	0.20	50	50	0.25	0.250	0.450	0.25	130
Pb-212	0.0050	0.03	15	15	0.04	0.040	0.100	0.04	40
Bi-214	0.0050	0.05	20	20	0.10	0.055	0.150	0.10	40
Pb-214	0.0050	0.07	20	20	0.50	0.080	0.150	0.50	80
Ac-228	0.0100	0.07	20	20	0.10	0.070	0.250	0.10	50
Ra-226							0.150		

Note: These are LLDs reported in the TVA Annual Radiological Monitoring Report, 2012

APPENDIX III

Southern Nuclear
Detection Capabilities of Environmental Samples
Values for the Minimum Detectible Concentrations (MDC)

Southern Nuclear								
Isotope Analysis	Airborne Particulate (pCi/m3)	Charcoal (pCi/m3)	Water (pCi/l)	Milk (pCi/l)	Vegetation Dry (pCi/g)	Sediment Dry (pCi/g)	Fish Dry (pCi/g)	Food (pCi/kg)
Alpha								
Beta	0.0100		4.0					
H-3			2000					
MN-54			15.0				0.13	
CO-58			15.0				0.13	
FE-59			30.0				0.26	
CO-60			15.0				0.13	
ZN-65			30.0				0.26	
NB-95			15.0					
ZR-95			30.0					
RU-103								
RU-106								
I-131	0.0700	0.07	1.0	1.0				60.0
CS-134	0.0500		15.0	15.0		0.15	0.13	60.0
CS-137	0.0600		18.0	18.0		0.18	0.15	80.0
BA-140			60.0	60.0				
LA-140			15.0	15.0				

Footnote: These LLDs are reported in the Southern Nuclear Annual Environmental Operating Report, 2010. Most detection limits reported in the Southern Nuclear exhibits, however, are calculated specifically for each sample. Most of these MDCs are substantially lower than the values reported in this appendix. If a measured activity exceeds a value in this appendix, the measurement is reported in bold print.

APPENDIX IV

Acronyms & Abbreviations

1.	ADEM	Alabama Department of Environmental Management
2.	ADPH	Alabama Department of Public Health
3.	AEC	Atomic Energy Commission
4.	ALARA	As Low as Reasonably Achievable
5.	AREMP	Alabama Radiological Environmental Monitoring Program
6.	BNP	Bellefonte Nuclear Power Plant
7.	BFNP	Browns Ferry Nuclear Power Plant
8.	BWR	Boiling Water Reactor
9.	CFM	Cubic Feet per Minute
10.	CFR	Code of Federal Regulations
11.	CRM	Chattahoochee River Mile
12.	DOD	Department of Defense
13.	EPA	Environmental Protection Agency
14.	EPZ	Emergency Planning Zone
15.	ETI	Eastern Technologies, Inc.
16.	FDA	Federal Drug Administration
17.	FEMA	Federal Emergency Management Agency
18.	FNP	Farley Nuclear Power Plant
19.	GeLi	Lithium Drifted Germanium Detector
20.	HPGe	High Purity Germanium Detector
21.	LLD	Lower Limit of Detection
22.	MDC	Minimum Detectable Concentration
23.	Mwe	Megawatts Electrical
24.	Mwt	Megawatts Thermal
25.	NCRP	National Council on Radiation Protection
26.	NRC	Nuclear Regulatory Commission
27.	ORNL	Oak Ridge National Laboratory
28.	PAL	Protective Action Level
29.	PIC	Pressurized Ionization Chamber
30.	PWR	Pressurized Water Reactor
31.	RPU	Remote Processing Unit
32.	STP	Sewage Treatment Plant
33.	TLD	Thermoluminescent Dosimeter
34.	TVA	Tennessee Valley Authority
35.	WTP	Water Treatment Plant

APPENDIX V
Units of Measurement

1. Measurement of Exposure:	Units	Description
Roentgen	*R*	
Mill roentgen	*mR*	*1 Thousandth of a Roentgen*
Microroentgen	*μR*	*1 Millionth of a Roentgen*

2. Measurement of Absorbed Dose:		
Rad	*rad*	*Radiation Absorbed Dose*
Millirad	*mrad*	*1 Thousandth of a rad*
Microrad	*μrad*	*1 Millionth of a rad*

3. Measurement of Biological Effectiveness of Absorbed Dose:		
rem	*rem*	*Dose x Quality Factor*
Millirem	*mrem*	*1 Thousandth of a rem*
Microrem	*μrem*	*1 Millionth of a rem*

4. Measurement of Exposure Rate:		
Roentgen per Hour	*R/hr*	
Milliroentgen per Hour	*mR/hr*	*1 Thousandth Rate of R/hr*
Microroetgen per Hour	*μR/hr*	*1 Millionth Rate of R/hr*

5. Measurement of Quantity of Radioactive Material:		
Curie	*Ci*	
Millicurie	*mCi*	*1 Thousandth of a Curie*
Microcurie	*μCi*	*1 Millionth of a Curie*
Nanocurie	*nCi*	*1 Billionth of a Curie*
Picocurie	*pCi*	*1 Trillionth of a Curie*

6. Measurement of Distance:		
Meter	*m*	
Centimeter	*cm*	*1 Hundredth of a Meter*
Millimeter	*mm*	*Thousandth of a Meter*

7. Measurement of Volume:		
Liter	*l*	
Milliliter	*ml*	*1 Thousandth of a Liter*

8. Measurement of Mass:		
Kilogram	*kg*	*1000 Grams*
Gram	*g*	
Milligram	*mg*	*1 Thousandth of a Gram*

APPENDIX VI

Definitions/Glossary

Alpha Radiation/Particles:
Alpha particles are actually helium nuclei ejected from radioactive atoms. Alpha particles are much less penetrating than gamma rays or beta particles but can do more tissue damage where they do penetrate because of their relatively large size. Although alpha particles do not penetrate the external layer of human skin, alpha radiation can do extensive damage to sensitive tissues immediately surrounding the emitting material if taken inside the body.

Beta Radiation/Particles:
Beta particles are high energy electrons ejected from radioactive atoms. Beta radiation is more penetrating than alpha radiation but less penetrating than gamma radiation. Beta radiation constitutes a hazard primarily when taken internally.

Criticality:
This term refers to the stage at which a nuclear chain reaction sustains itself. Being critical is the normal operating condition of a nuclear reactor.

Confidence Intervals:
This term quantifies the reliability of a statistical measurement. The 95% confidence intervals the State presents in this report indicates there is a 95% probability the ***actual*** sample activity is within ± (plus or minus) the error of the ***measured*** activity. TVA error (one sigma error) represents a 67% probability.

Gamma Radiation:
Gamma rays have the shortest wavelengths in the electromagnetic spectrum. Gamma rays are the most penetrating and most dangerous of the three types of ionizing radiation.

Ion:
An ion is an atomic particle, atom, or chemical radical bearing an electrical charge, either negative or positive. Ionizing radiation is radiation that has sufficient energy to produce ion pairs in matter that it penetrates.

Nuclide:
One of a number of varieties of the same chemical element with different numbers of neutrons. A radionuclide is a radioactive nuclide.