VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

April 25, 2012

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Serial No. 12-270
SS&L/JSA R0
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

Enclosed is the Surry Power Station Annual Radioactive Effluent Release Report for January 1, 2011 through December 31, 2011. The report, submitted pursuant to Surry Power Station Technical Specification 6.6.B.3, includes a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released during the 2011 calendar year, as outlined in Regulatory Guide 1.21, Revision 1, June 1974.

If you have any further questions, please contact Jason Eggart at 757-365-2010.

Sincerely,

B. L. Stanley
Director Safety & Licensing
Surry Power Station

Attachment

Commitments made in this letter: None

cc: U. S. Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, Georgia 30303-1257

NRC Senior Resident Inspector
Surry Power Station

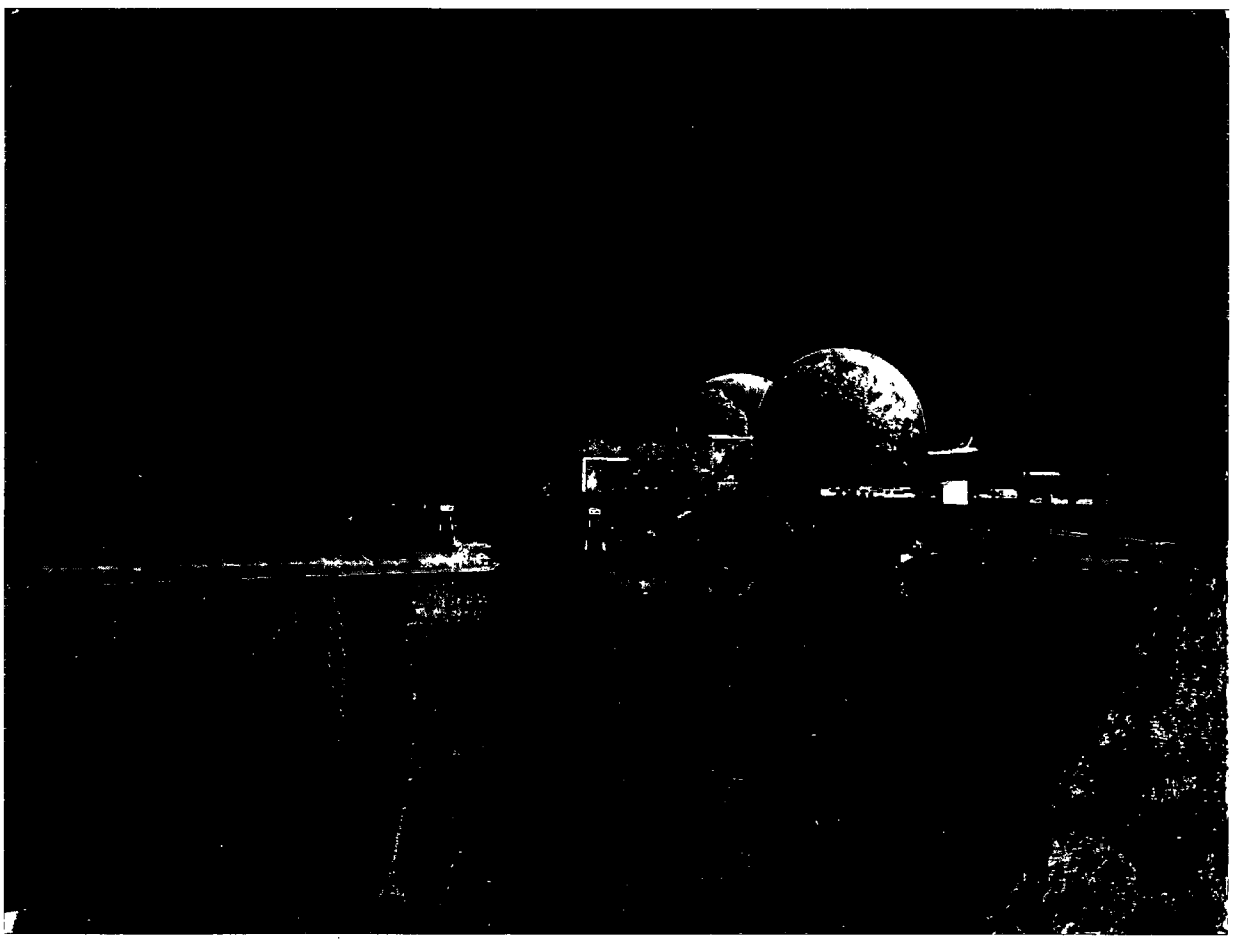
IE48
NRR

ATTACHMENT 1

2011 Annual Radioactive Effluent Release Report

SURRY POWER STATION UNITS 1 AND 2
VIRGINIA ELECTRIC AND POWER COMPANY

Surry Power Station



2011 Annual Radioactive Effluent Release Report

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ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

SURRY POWER STATION

January 1, 2011 through December 31, 2011

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ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

FOR THE

SURRY POWER STATION

January 1, 2011 through December 31, 2011

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FORWARD

This report is submitted as required by Appendix A to Operating License Nos. DPR-32 and DPR-37, Technical Specifications for Surry Power Station, Units 1 and 2, Virginia Electric and Power Company, Docket Nos. 50-280, 50-281, Section 6.6.B.3.

EXECUTIVE SUMMARY
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

The Annual Radioactive Effluent Release Report describes the radiological effluent control program conducted at Surry Power Station during the 2011 calendar year. This document summarizes the quantities of radioactive liquid and gaseous effluents and solid waste released from Surry Power Station in accordance with Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants", Revision 1, June 1974. The report also includes an assessment of radiation doses to the maximum exposed member of the public due to the radioactive liquid and gaseous effluents.

During this reporting period, there were no unplanned liquid or gaseous effluent releases as classified according to the criteria in the Offsite Dose Calculation Manual.

Based on the 2011 effluent release data, 10CFR50 Appendix I dose calculations were performed in accordance with the Offsite Dose Calculation Manual. The dose calculations are as follows:

1. The total body dose due to liquid effluents was 1.59-04 mrem, which is 2.65-03% of the 6 mrem dose limit. The critical organ doses due to liquid effluents, GI-LLI and Liver respectively, were 2.70E-04 mrem and 1.56E-04 mrem. These doses are 1.35E-03% and 7.80E-04% of the respective 20 mrem dose limit.

2. The air dose due to noble gases in gaseous effluents was 2.12E-04 mrad gamma, which is 1.06E-03% of the 20 mrad gamma dose limit, and 3.05E-04 mrad beta, which is 8.75E-04% of the 40 mrad beta dose limit.

3. The critical organ dose from gaseous effluents due to I-131, I-133, H-3, and particulates with half-lives greater than 8 days is 2.64E-01 mrem, which is 8.80E-01% of the 30 mrem dose limit.

There were no major changes to the radioactive liquid, gaseous or solid waste treatment systems during this reporting period.

There were no changes to VPAP-2103S, Offsite Dose Calculation Manual, during this reporting period.

In accordance with the Nuclear Energy Institute (NEI) Industry Ground Water Protection Initiative, analysis results of ground water monitoring locations not included in the Radiological Environmental Monitoring Program (REMP), will be included in this report. Ground water monitoring well sample results are provided in Attachment 8.

Based on the radioactivity measured and the dose calculations performed during this reporting period, the operation of Surry Power Station has resulted in negligible radiation dose consequences to the maximum exposed member of the public in unrestricted areas.

Purpose and Scope

Attachment 1 includes a summary of the quantities of radioactive liquid and gaseous effluents and solid waste as outlined in Regulatory Guide 1.21, with data summarized on a quarterly or annual basis following the format of Tables 1, 2 and 3 of Appendix B, thereof. Attachment 2 of this report includes an assessment of radiation doses to the maximum exposed member of the public due to radioactive liquid and gaseous effluents released from the site during 2011.

As required by Technical Specification 6.8.B, changes to the Offsite Dose Calculation Manual (ODCM) for the time period covered by this report are included in Attachment 3. Major changes to the radioactive liquid, gaseous and solid waste treatment systems are reported in Attachment 4, as required by the ODCM, Section 6.7.2. If changes are made to these systems, the report shall include information to support the reason for the change and a summary of the 10CFR50.59 evaluation. In lieu of reporting major changes in this report, major changes to the radioactive waste treatment systems may be submitted as part of the annual FSAR update.

As required by the ODCM, Sections 6.2.2 and 6.3.2, a list and explanation for the inoperability of radioactive liquid and/or gaseous effluent monitoring instrumentation is provided in Attachment 5 of this report. Additionally, a list of unplanned releases during the reporting period is included in Attachment 6.

Attachment 7 provides the typical lower limit of detection (LLD) capabilities of the radioactive effluent analysis instrumentation.

As required by the ODCM, Section 6.7.5, a summary of on-site radioactive spills or leaks that were communicated in accordance with the Industry Ground Water Protection Initiative reporting protocol, and sample analyses from ground water wells that are not part of the Radiological Environmental Monitoring Program are provided in Attachment 8.

Discussion

The basis for the calculation of the percent of technical specification for the critical organ in Table 1A of Attachment 1 is the ODCM, Section 6.3.1, which requires that the dose rate for iodine-131, iodine-133, for tritium, and for all radionuclides in particulate form with half-lives greater than 8 days shall be less than or equal to 1500 mrem/yr to the critical organ at or beyond the site boundary. The critical receptor is the child via the inhalation pathway.

The basis for the calculation of the percent of technical specification for the total body and skin in Table 1A of Attachment 1 is the ODCM, Section 6.3.1, which requires that the dose rate for noble gases to areas at or beyond site boundary shall be less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin.

The basis for the calculation of the percent of technical specification in Table 2A of Attachment 1 is the ODCM, Section 6.2.1, which states that the concentration of radioactive material releases in liquid effluents to unrestricted areas shall not exceed ten times the concentrations specified in 10CFR20, Appendix B, Table 2, Column 2, for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2.00E-04 microcuries/mL.

Percent of technical specification calculations are based on the total gaseous or liquid effluents released for the respective quarter.

The annual and quarterly doses, as reported in Attachment 2, were calculated according to the methodology presented in the ODCM. The beta and gamma air doses due to noble gases released from the site were calculated at the site boundary. The maximum exposed member of the public from the release of airborne iodine-131, iodine-133, tritium and all radionuclides in particulate form with half-lives greater than 8 days, was a child at 2.05 miles with the critical organ being the bone via the ingestion pathway. The maximum exposed member of the public from radioactive materials in liquid effluents in unrestricted areas was an adult, exposed by either the invertebrate or fish pathway, with the critical organ typically being the gastrointestinal-lower large intestine. The total body dose was also determined for this individual.

During 2011, effluent samples identified detectable concentrations of iodine-131 that could be related to the operation of Surry Power Station in March and April. The concentrations detected were above levels historically observed for the station's operational status during that period. Concentrations returned to those historically observed levels after April. Given the events of March 2011 at the Daiichi nuclear power plant, Fukushima Japan and the associated airborne releases and subsequent trans-Pacific transportation, the slightly elevated concentrations detected in March and April are reasonably attributed to the Daiichi releases. However, the concentrations detected at Surry Power Station and projected doses are conservatively included in this report for completeness.

Presented in Attachment 6 is a list of unplanned gaseous and liquid releases as required by the ODCM, Section 6.7.2.

The typical lower limit of detection (LLD) capabilities of the radioactive effluent analysis instrumentation are presented in Attachment 7. These LLD values are based upon conservative conditions (i.e., minimum sample volumes and maximum delay time prior to analysis). Actual LLD values may be lower. If a radioisotope was not detected when effluent samples were analyzed, then the activity of the radioisotope was reported as Not Detected (N/D) on Attachment 1 of this report. When all isotopes listed on Attachment 1 for a particular quarter and release mode are less than the lower limit of detection, then the totals for this period will be designated as Not Applicable (N/A).

Supplemental Information

Section 6.6.1 of the ODCM requires the identification of the cause(s) for the unavailability of milk, or if required, leafy vegetation samples, and the identification for obtaining replacement samples. As milk was available for collection during this reporting period, leafy vegetation sampling was not required.

As required by the ODCM, Section 6.6.2, evaluation of the Land Use Census is made to determine if new sample location(s) must be added to the Radiological Environmental Monitoring Program. Evaluation of the Land Use Census conducted for this reporting period identified no change in sample locations for the Radiological Environmental Monitoring Program.

Attachment 1

EFFLUENT RELEASE DATA

January 1, 2011 through December 31, 2011

This attachment includes a summary of the quantities of radioactive liquid and gaseous effluents and solid waste as outlined in Regulatory Guide 1.21, Appendix B.

TABLE 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
GASEOUS EFFLUENT-SUMMATION OF ALL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	FIRST QUARTER	SECOND QUARTER	% EST. ERROR
A. FISSION & ACTIVATION GASES				
1. TOTAL RELEASE	Ci	2.88E-01	3.66E-01	1.80E+01
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	3.70E-02	4.66E-02	
B. IODINE				
1. TOTAL I-131	Ci	1.30E-05	6.20E-06	2.80E+01
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	1.68E-06	7.89E-07	
C. PARTICULATE				
1. HALF-LIFE >8 DAYS	Ci	4.59E-06	1.09E-05	2.80E+01
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	5.90E-07	1.39E-06	
3. GROSS ALPHA RADIOACTIVITY	Ci	N/D	N/D	
D. TRITIUM				
1. TOTAL RELEASE	Ci	7.40E+00	1.27E+01	3.10E+01
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	9.52E-01	1.62E+00	
E. CARBON-14				
1. TOTAL RELEASE	Ci	6.54E+00	8.33E+00	
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	8.41E-07	1.06E-06	
PERCENTAGE OF T.S. LIMITS				
CRITICAL ORGAN DOSE RATE	%	4.38E-03	1.33E-02	
TOTAL BODY DOSE RATE	%	7.52E-06	1.40E-04	
SKIN DOSE RATE	%	2.87E-06	3.72E-05	

TABLE 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
GASEOUS EFFLUENT-SUMMATION OF ALL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	THIRD QUARTER	FOURTH QUARTER	% EST. ERROR
A. FISSION & ACTIVATION GASES				
1. TOTAL RELEASE	Ci	9.63E-02	2.38E-03	1.80E+01
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	1.21E-02	2.99E-04	
B. IODINE				
1. TOTAL I-131	Ci	N/D	N/D	2.80E+01
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	N/A	N/A	
C. PARTICULATE				
1. HALF-LIFE >8 DAYS	Ci	N/D	N/D	2.80E+01
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	N/A	N/A	
3. GROSS ALPHA RADIOACTIVITY	Ci	N/D	N/D	
D. TRITIUM				
1. TOTAL RELEASE	Ci	9.56E+00	8.48E+00	3.10E+01
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	1.20E+00	1.07E+00	
E. CARBON-14				
1. TOTAL RELEASE	Ci	2.19E+00	5.41E-02	
2. AVE RELEASE RATE FOR PERIOD	µCi/sec	2.76E-07	6.81E-09	
PERCENTAGE OF T.S. LIMITS				
CRITICAL ORGAN DOSE RATE	%	2.28E-02	7.38E-04	
TOTAL BODY DOSE RATE	%	6.78E-06	4.91E-06	
SKIN DOSE RATE	%	1.97E-05	1.76E-06	

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
GASEOUS EFFLUENTS-MIXED MODE RELEASES

		CONTINUOUS MODE		BATCH MODE	
SURRY POWER STATION UNITS 1&2	UNIT	FIRST QUARTER	SECOND QUARTER	FIRST QUARTER	SECOND QUARTER
1. FISSION & ACTIVATION GASES					
Kr-85	Ci	N/D	N/D	N/D	N/D
Kr-85m	Ci	N/D	N/D	2.45E-04	N/D
Kr-87	Ci	N/D	N/D	N/D	N/D
Kr-88	Ci	N/D	N/D	N/D	N/D
Xe-133	Ci	N/D	N/D	2.55E-01	3.35E-01
Xe-135	Ci	N/D	N/D	2.00E-02	1.66E-04
Xe-135m	Ci	N/D	N/D	N/D	N/D
Xe-138	Ci	N/D	N/D	N/D	N/D
Xe-131m	Ci	N/D	N/D	N/D	N/D
Xe-133m	Ci	N/D	N/D	2.72E-03	9.93E-04
Ar-41	Ci	N/D	N/D	5.19E-04	N/D
TOTAL FOR PERIOD	Ci	N/A	N/A	2.78E-01	3.36E-01
2. IODINES					
I-131	Ci	N/D	N/D	N/D	N/D
I-133	Ci	N/D	N/D	N/D	N/D
I-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	N/A	N/A	N/A	N/A
3. PARTICULATES					
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
Co-58	Ci	N/D	N/D	N/D	N/D
Co-60	Ci	N/D	N/D	N/D	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
C-14	Ci	N/D	N/D	6.34E+00	7.64E+00
TOTAL FOR PERIOD	Ci	N/A	N/A	6.34E+00	7.64E+00

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
GASEOUS EFFLUENTS-MIXED MODE RELEASES

		CONTINUOUS MODE		BATCH MODE	
SURRY POWER STATION UNITS 1&2	UNIT	THIRD QUARTER	FOURTH QUARTER	THIRD QUARTER	FOURTH QUARTER
1. FISSION & ACTIVATION GASES					
Kr-85	Ci	N/D	N/D	N/D	N/D
Kr-85m	Ci	N/D	N/D	N/D	N/D
Kr-87	Ci	N/D	N/D	N/D	N/D
Kr-88	Ci	N/D	N/D	N/D	N/D
Xe-133	Ci	N/D	N/D	4.09E-02	5.80E-04
Xe-135	Ci	N/D	N/D	N/D	N/D
Xe-135m	Ci	N/D	N/D	N/D	N/D
Xe-138	Ci	N/D	N/D	N/D	N/D
Xe-131m	Ci	N/D	N/D	N/D	N/D
Xe-133m	Ci	N/D	N/D	N/D	N/D
Ar-41	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	N/A	N/A	4.09E-02	5.80E-04
2. IODINES					
I-131	Ci	N/D	N/D	N/D	N/D
I-133	Ci	N/D	N/D	N/D	N/D
I-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	N/A	N/A	N/A	N/A
3. PARTICULATES					
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
Co-58	Ci	N/D	N/D	N/D	N/D
Co-60	Ci	N/D	N/D	N/D	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
C-14	Ci	N/D	N/D	9.30E-01	1.32E-02
TOTAL FOR PERIOD	Ci	N/A	N/A	9.30E-01	1.32E-02

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

		CONTINUOUS MODE		BATCH MODE	
SURRY POWER STATION UNITS 1&2	UNIT	FIRST QUARTER	SECOND QUARTER	FIRST QUARTER	SECOND QUARTER
1. FISSION & ACTIVATION GASES					
Kr-85	Ci	N/D	N/D	N/D	N/D
Kr-85m	Ci	N/D	N/D	N/D	N/D
Kr-87	Ci	N/D	N/D	N/D	N/D
Kr-88	Ci	N/D	3.68E-05	N/D	N/D
Xe-133	Ci	N/D	N/D	7.95E-03	1.44E-02
Xe-135	Ci	8.19E-05	2.11E-04	9.21E-04	5.71E-03
Xe-135m	Ci	N/D	3.12E-05	N/D	1.97E-03
Xe-138	Ci	N/D	N/D	N/D	N/D
Xe-131m	Ci	N/D	N/D	N/D	N/D
Xe-133m	Ci	N/D	N/D	N/D	N/D
Ar-41	Ci	N/D	4.64E-04	N/D	7.41E-03
TOTAL FOR PERIOD	Ci	8.19E-05	7.43E-04	8.87E-03	2.95E-02
2. IODINES					
I-131	Ci	1.30E-05	6.20E-06	N/D	6.16E-09
I-132	Ci	N/D	N/D	N/D	N/D
I-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	1.30E-05	6.20E-06	N/A	6.16E-09
3. PARTICULATES					
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
Co-58	Ci	4.59E-06	1.09E-05	N/D	N/D
Co-60	Ci	N/D	N/D	N/D	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
C-14	Ci	1.86E-03	1.69E-02	2.02E-01	6.71E-01
TOTAL FOR PERIOD	Ci	1.86E-03	1.69E-02	2.02E-01	6.71E-01

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	CONTINUOUS MODE		BATCH MODE	
		THIRD QUARTER	FOURTH QUARTER	THIRD QUARTER	FOURTH QUARTER
1. FISSION & ACTIVATION GASES					
Kr-85	Ci	N/D	N/D	5.19E-02	N/D
Kr-85m	Ci	N/D	N/D	N/D	N/D
Kr-87	Ci	N/D	N/D	N/D	N/D
Kr-88	Ci	N/D	N/D	N/D	N/D
Xe-133	Ci	4.08E-05	4.81E-05	1.81E-03	N/D
Xe-135	Ci	1.49E-04	2.14E-04	1.48E-03	1.49E-03
Xe-135m	Ci	2.53E-05	4.46E-05	N/D	N/D
Xe-138	Ci	N/D	N/D	N/D	N/D
Xe-131m	Ci	N/D	N/D	N/D	N/D
Xe-133m	Ci	N/D	N/D	N/D	N/D
Ar-41	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	2.15E-04	3.07E-04	5.52E-02	1.49E-03
2. IODINES					
I-131	Ci	N/D	N/D	N/D	N/D
I-133	Ci	N/D	N/D	N/D	N/D
I-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	N/A	N/A	N/A	N/A
3. PARTICULATES					
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
Co-58	Ci	N/D	N/D	N/D	N/D
Co-60	Ci	N/D	N/D	N/D	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
C-14	Ci	4.90E-03	6.97E-03	1.26E+00	3.39E-02
TOTAL FOR PERIOD	Ci	4.90E-03	6.97E-03	1.26E+00	3.39E-02

TABLE 2A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	FIRST QUARTER	SECOND QUARTER	% EST. ERROR
A. FISSION AND ACTIVATION PRODUCTS				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	Ci	9.37E-03	7.25E-03	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	µCi/mL	1.44E-11	1.28E-11	
3. PERCENT OF APPLICABLE LIMIT	%	1.61E-05	1.33E-05	
B. TRITIUM				
1. TOTAL RELEASE	Ci	3.10E+02	2.30E+02	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	µCi/mL	4.75E-07	4.07E-07	
3. PERCENT OF APPLICABLE LIMIT	%	4.75E-03	4.07E-03	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	Ci	N/D	4.62E-05	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	µCi/mL	N/A	8.17E-14	
3. PERCENT OF APPLICABLE LIMIT	%	N/A	4.08E-08	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	Ci	N/D	N/D	2.00E+01
E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)	LITERS	3.28E+07	3.49E+07	3.00E+00
F. VOLUME OF DILUTION WATER USED DURING PERIOD	LITERS	6.51E+11	5.66E+11	3.00E+00

TABLE 2A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	THIRD QUARTER	FOURTH QUARTER	% EST. ERROR
A. FISSION AND ACTIVATION PRODUCTS				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	Ci	2.46E-03	5.39E-04	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	µCi/mL	3.18E-12	7.70E-13	
3. PERCENT OF APPLICABLE LIMIT	%	9.43E-06	4.99E-06	
B. TRITIUM				
1. TOTAL RELEASE	Ci	3.56E+01	7.81E+01	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	µCi/mL	4.60E-08	1.12E-07	
3. PERCENT OF APPLICABLE LIMIT	%	4.60E-04	1.12E-03	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	Ci	N/D	N/D	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	µCi/mL	N/A	N/A	
3. PERCENT OF APPLICABLE LIMIT	%	N/A	N/A	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	Ci	N/D	N/D	2.00E+01
E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)	LITERS	4.35E+07	2.76E+07	3.00E+00
F. VOLUME OF DILUTION WATER USED DURING PERIOD	LITERS	7.74E+11	7.00E+11	3.00E+00

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
LIQUID EFFLUENTS

SURRY POWER STATION UNITS 1&2	UNIT	CONTINUOUS MODE FIRST QUARTER	CONTINUOUS MODE SECOND QUARTER	BATCH MODE FIRST QUARTER	BATCH MODE SECOND QUARTER
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Fe-55	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	2.37E-04	3.75E-04	1.38E-05	1.18E-04
I-131	Ci	N/D	6.91E-06	N/D	N/D
Co-58	Ci	N/D	N/D	6.19E-03	1.79E-03
Co-60	Ci	N/D	N/D	1.31E-03	3.85E-04
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Cr-51	Ci	N/D	N/D	N/D	3.88E-03
Zr-95	Ci	N/D	N/D	N/D	N/D
Nb-95	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Tc-99m	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
Sb-124	Ci	N/D	N/D	7.23E-06	2.39E-05
Sb-125	Ci	N/D	N/D	1.60E-03	6.69E-04
Co-57	Ci	N/D	N/D	9.40E-06	N/D
TOTAL FOR PERIOD	Ci	2.37E-04	3.82E-04	9.13E-03	6.87E-03
Xe-133	Ci	N/D	N/D	N/D	4.62E-05
Xe-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	N/A	N/A	N/A	4.62E-05

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/11 TO 12/31/11
LIQUID EFFLUENTS

SURRY POWER STATION UNITS 1&2	UNIT	CONTINUOUS MODE		BATCH MODE	
		THIRD QUARTER	FOURTH QUARTER	THIRD QUARTER	FOURTH QUARTER
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Fe-55	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	4.57E-04	2.45E-04	9.50E-05	7.54E-05
I-131	Ci	N/D	N/D	N/D	N/D
Co-58	Ci	N/D	N/D	8.38E-04	8.67E-05
Co-60	Ci	N/D	N/D	3.77E-04	6.69E-05
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Cr-51	Ci	N/D	N/D	4.55E-04	N/D
Zr-95	Ci	N/D	N/D	N/D	N/D
Nb-95	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Tc-99m	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
Sb-124	Ci	N/D	N/D	5.55E-06	N/D
Sb-125	Ci	N/D	N/D	2.29E-04	6.48E-05
Co-57	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	4.57E-04	2.45E-04	2.00E-03	2.94E-04
Xe-133	Ci	N/D	N/D	N/D	N/D
Xe-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	N/A	N/A	N/A	N/A

TABLE 3

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
PERIOD: 1/1/11 - 12/31/11

SURRY POWER STATION

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of waste		12 month Period		Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3	1.63E+01	Note 1	1.00E+01
	Ci	2.77E+02		3.00E+01
b. Dry compressible waste, contaminated equip., etc.	m^3	5.26E+02	Note 2	1.00E+01
	Ci	1.08E+00		3.00E+01
c. Irradiated components, control rods, etc.	m^3	0.00E+00		1.00E+01
	Ci	0.00E+00		3.00E+01
d. Other (Waste oil)	m^3	0.00E+00		1.00E+01
	Ci	0.00E+00		3.00E+01

2. Estimate of major nuclide composition (by type of waste)

a. Ni-63	%	5.40E+01
Co-60	%	3.09E+01
Fe-55	%	8.01E+00
Mn-54	%	1.77E+00
Co-58	%	1.75E+00
Cs-137	%	1.24E+00
b. Co-60	%	4.39E+01
Ni-63	%	2.62E+01
Cs-137	%	1.34E+01
Fe-55	%	1.16E+01
Co-58	%	1.69E+00
Mn-54	%	1.15E+00
Sb-125	%	1.02E+00
c.	%	
d.	%	

TABLE 3

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
PERIOD: 1/1/11 - 12/31/11
CONTINUED

SURRY POWER STATION

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
17	Truck	Oak Ridge, TN (Energy*Solutions*)
1	Truck	Erwin, TN (Studsvik)

B. IRRADIATED FUEL SHIPMENT (Disposition)

Number of Shipments	Mode of Transportation	Destination
0		

NOTE 1: Some of this waste was shipped to licensed waste processors for processing and/or volume reduction. Therefore, this volume is not representative of the actual volume buried. The total volume buried for this reporting period is 2.11E-01 m^3.

NOTE 2: Some DAW was shipped to licensed waste processors for processing and/or volume reduction. Therefore, this volume is not representative of the actual volume buried. The total volume buried for this reporting period is 2.26E+02 m^3.

ANNUAL AND QUARTERLY DOSES

An assessment of radiation doses to the maximum exposed member of the public due to radioactive liquid and gaseous effluents released from the site for each calendar quarter for the calendar year of this report, along with an annual total of each effluent pathway is made pursuant to the ODCM, Section 6.7.2, requirement.

2011	LIQUID			GASEOUS		
	Total Body (mrem)	GI-LLI (mrem)	Liver (mrem)	Gamma (mrad)	Beta (mrad)	Bone (mrem)
1st Quarter	6.91E-05	1.39E-04	6.48E-05	1.06E-05	2.44E-05	5.66E-02
2nd Quarter	6.47E-05	9.49E-05	6.45E-05	1.86E-04	1.13E-04	1.02E-01
3rd Quarter	9.75E-06	1.96E-05	1.02E-05	9.22E-06	2.04E-04	1.00E-01
4th Quarter	1.58E-05	1.61E-05	1.65E-05	6.55E-06	8.15E-06	5.33E-03
Annual	1.59E-04	2.70E-04	1.56E-04	2.12E-04	3.50E-04	2.64E-01

REVISIONS TO OFFSITE DOSE CALCULATION MANUAL (ODCM)

As required by Technical Specification 6.8.B, revisions to the ODCM, effective for the time period covered by this report, are included with this attachment. There were no revisions to the ODCM implemented during this reporting period.

MAJOR CHANGES TO RADIOACTIVE LIQUID, GASEOUS AND SOLID WASTE TREATMENT SYSTEMS

There were no major changes to the radioactive liquid, gaseous or solid waste treatment systems for this reporting period.

INOPERABILITY OF RADIOACTIVE LIQUID AND GASEOUS EFFLUENT MONITORING INSTRUMENTATION

The Annual Radioactive Effluent Release Report shall explain why monitoring instrumentation required by the ODCM Attachments 1 and 5, which were determined to be inoperable, were not returned to operable status within 30 days. One component of the above referenced instrumentation was inoperable greater than 30 days during this reporting period.

One of the two Unit #1 condenser air ejector exhaust flow rate indicators, 1-VP-FI-1A, was out of service from 1/10/2011 to 3/10/2011. During routine Unit #1 Turbine Building rounds, Operations discovered the flow indicator contained water that impaired the flow indicator from performing its function. An Engineering review of this issue determined that the flow indicator did not have a drain to remove water accumulation. Design Change SU-11-01029-000 was generated to install a drain on the 1-VP-FI-1A, 1-VP-FI-1B and also the Unit #2 flow rate indicators. 1-VP-FI-1A was returned to service on 3/10/2011 upon completion of the drain valve installation.

UNPLANNED RELEASES

There were no unplanned liquid or unplanned gaseous releases during this reporting period.

LOWER LIMIT OF DETECTION (LLD) FOR EFFLUENT SAMPLE ANALYSIS

	Isotope	Required LLD	Typical LLD
GASEOUS:	Kr-87	1.00E-04	2.16E-08 - 1.71E-05
	Kr-88	1.00E-04	1.98E-08 - 2.15E-05
	Xe-133	1.00E-04	1.15E-08 - 2.21E-05
	Xe-133m	1.00E-04	3.95E-08 - 4.06E-05
	Xe-135	1.00E-04	5.32E-09 - 6.67E-06
	Xe-135m	1.00E-04	2.93E-07 - 6.65E-05
	Xe-138	1.00E-04	6.04E-07 - 9.90E-05
	I-131	1.00E-12	5.98E-14 - 4.06E-13
	I-133	1.00E-10	1.10E-12 - 4.06E-11
	Sr-89	1.00E-11	1.28E-14 - 5.31E-12
	Sr-90	1.00E-11	1.52E-15 - 5.83E-13
	Cs-134	1.00E-11	4.06E-14 - 4.01E-13
	Cs-137	1.00E-11	2.24E-14 - 6.83E-13
	Mn-54	1.00E-11	4.98E-14 - 4.44E-13
	Fe-59	1.00E-11	8.63E-14 - 5.80E-12
	Co-58	1.00E-11	3.17E-14 - 2.17E-13
	Co-60	1.00E-11	6.75E-14 - 5.41E-13
	Zn-65	1.00E-11	8.39E-14 - 7.11E-13
	Mo-99	1.00E-11	2.49E-13 - 4.06E-12
	Ce-141	1.00E-11	4.36E-14 - 3.97E-13
	Ce-144	1.00E-11	1.89E-13 - 1.60E-12
	Alpha	1.00E-11	1.70E-14 - 1.71E-14
	Tritium	1.00E-06	6.38E-08 - 6.38E-08
LIQUID:	Sr-89	5.00E-08	2.03E-08 - 4.94E-08
	Sr-90	5.00E-08	3.31E-09 - 8.14E-09
	Cs-134	5.00E-07	7.99E-09 - 7.13E-08
	Cs-137	5.00E-07	3.02E-09 - 4.86E-08
	I-131	1.00E-06	7.63E-09 - 4.93E-08
	Co-58	5.00E-07	6.23E-09 - 4.97E-08
	Co-60	5.00E-07	1.13E-08 - 9.47E-08
	Fe-59	5.00E-07	1.37E-08 - 1.08E-07
	Zn-65	5.00E-07	1.34E-08 - 1.38E-07
	Mn-54	5.00E-07	8.93E-09 - 6.52E-08
	Mo-99	5.00E-07	3.82E-08 - 4.95E-07
	Ce-141	5.00E-07	9.85E-09 - 6.86E-08
	Ce-144	5.00E-07	4.37E-08 - 3.47E-07
	Fe-55	1.00E-06	3.16E-07 - 9.22E-07
	Alpha	1.00E-07	2.84E-08 - 2.89E-08
	Tritium	1.00E-05	1.58E-06 - 1.58E-06
	Xe-133	1.00E-05	1.81E-08 - 8.72E-07
	Xe-135	1.00E-05	7.59E-09 - 5.17E-08
	Xe-133m	1.00E-05	5.67E-08 - 3.81E-07
	Xe-135m	1.00E-05	3.95E-07 - 3.40E-06
	Xe-138	1.00E-05	8.60E-07 - 8.15E-06
	Kr-87	1.00E-05	2.97E-08 - 1.70E-07
	Kr-88	1.00E-05	2.88E-08 - 1.19E-07

INDUSTRY GROUND WATER PROTECTION INITIATIVE

The following is a summary of 2011 sample analyses of ground water monitoring wells that are not a part of the Radiological Environmental Monitoring Program (REMP). Analyses are performed by an independent laboratory.

Well Designation	Sample Date	Tritium pCi/Liter	Gamma pCi/Liter	Fe-55 pCi/Liter	Ni-63 pCi/Liter	Sr-90 pCi/Liter	TRU pCi/Liter
1-PL-Piez-04	2/16/11	<577	ND	NA	NA	NA	NA
1-PL-Piez-05	2/15/11	13,400	ND	<85.9	<4.58	<0.505	NA
1-PL-Piez-06	2/15/11	2,510	ND	<64.2	<4.68	<0.660	NA
1-PL-Piez-07	2/15/11	<568	ND	NA	NA	NA	NA
1-PL-Piez-27	2/15/11	<569	ND	NA	NA	NA	NA
1-PL-Piez-29	2/16/11	8,900	ND	<110	<4.67	<0.527	NA
1-PL-Piez-33	2/15/11	<575	ND	NA	NA	NA	NA
1-PL-Piez-34	2/15/11	<564	ND	NA	NA	NA	NA
1-PL-Piez-41	2/15/11	<558	ND	NA	NA	NA	NA
1-PL-Piez-42	2/16/11	<579	ND	NA	NA	NA	NA
1-PL-Piez-03	6/2/11	<840	NA	NA	NA	NA	NA
1-PL-Piez-04	6/1/11	<829	ND	NA	NA	NA	NA
1-PL-Piez-05	5/24/11	10,800	ND	NA	NA	NA	NA
1-PL-Piez-06	5/24/11	3,450	ND	NA	NA	NA	NA
1-PL-Piez-07	5/31/11	<816	ND	NA	NA	NA	NA
1-PL-Piez-08	5/31/11	<860	ND	NA	NA	NA	NA
1-PL-Piez-09	6/1/11	<853	NA	NA	NA	NA	NA
1-PL-Piez-20	6/1/11	<799	ND	NA	NA	NA	NA
1-PL-Piez-22	5/31/11	<846	ND	NA	NA	NA	NA
1-PL-Piez-23	6/2/11	<870	ND	NA	NA	NA	NA
1-PL-Piez-24	6/1/11	<838	ND	NA	NA	NA	NA
1-PL-Piez-25	6/1/11	<811	ND	NA	NA	NA	NA
1-PL-Piez-27	5/31/11	<873	ND	NA	NA	NA	NA
1-PL-Piez-28	5/31/11	<874	ND	NA	NA	NA	NA
1-PL-Piez-29	5/24/11	7,780	ND	NA	NA	NA	NA
1-PL-Piez-33	5/31/11	<882	ND	NA	NA	NA	NA
1-PL-Piez-34	5/31/11	<871	ND	NA	NA	NA	NA
1-PL-Piez-35	6/1/11	<882	NA	NA	NA	NA	NA
1-PL-Piez-36	5/31/11	<821	NA	NA	NA	NA	NA
1-PL-Piez-37	6/2/11	<887	NA	NA	NA	NA	NA
1-PL-Piez-38	6/1/11	<866	NA	NA	NA	NA	NA
1-PL-Piez-39	6/1/11	<877	NA	NA	NA	NA	NA
1-PL-Piez-40	6/1/11	<885	ND	NA	NA	NA	NA
1-PL-Piez-41	5/31/11	<875	ND	NA	NA	NA	NA
1-PL-Piez-42	6/1/11	<745	ND	NA	NA	NA	NA

ND = No non-natural gamma emitting nuclides detected when analyzed to REMP LLDs.
NA = Analysis not required. TRU = Transuranics (Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240 and Pu-241)

INDUSTRY GROUND WATER PROTECTION INITIATIVE

The following is a summary of 2011 sample analyses of ground water monitoring wells that are not a part of the Radiological Environmental Monitoring Program (REMP). Analyses are performed by an independent laboratory.

Well Designation	Sample Date	Tritium pCi/Liter	Gamma pCi/Liter	Fe-55 pCi/Liter	Ni-63 pCi/Liter	Sr-90 pCi/Liter	TRU pCi/Liter
1-PL-Piez-05	6/23/11	11,700	NA	NA	NA	NA	NA
1-PL-Piez-06	6/23/11	2,120	NA	NA	NA	NA	NA
1-PL-Piez-29	6/23/11	8,520	NA	NA	NA	NA	NA
1-PL-Piez-05	7/28/11	8,360	NA	NA	NA	NA	NA
1-PL-Piez-06	7/28/11	2,020	NA	NA	NA	NA	NA
1-PL-Piez-29	7/29/11	7,080	NA	NA	NA	NA	NA
1-PL-Piez-04	8/24/11	<999	ND	NA	NA	NA	NA
1-PL-Piez-05	8/24/11	11,500	ND	NA	NA	NA	NA
1-PL-Piez-06	8/24/11	1,740	ND	NA	NA	NA	NA
1-PL-Piez-07	8/25/11	<997	ND	NA	NA	NA	NA
1-PL-Piez-08	8/25/11	<1,010	ND	NA	NA	NA	NA
1-PL-Piez-24	8/24/11	<1,010	ND	NA	NA	NA	NA
1-PL-Piez-25	8/24/11	<1,000	ND	NA	NA	NA	NA
1-PL-Piez-27	8/25/11	<998	ND	NA	NA	NA	NA
1-PL-Piez-29	8/24/11	8,320	ND	NA	NA	NA	NA
1-PL-Piez-33	8/24/11	<994	ND	NA	NA	NA	NA
1-PL-Piez-34	8/24/11	<995	ND	NA	NA	NA	NA
1-PL-Piez-41	8/24/11	<995	ND	NA	NA	NA	NA
1-PL-Piez-42	8/24/11	<1,000	ND	NA	NA	NA	NA
1-PL-Piez-04	12/7/11	<1,030	ND	NA	NA	NA	NA
1-PL-Piez-05	12/6/11	9,920	ND	NA	NA	NA	NA
1-PL-Piez-06	12/7/11	2,500	ND	NA	NA	NA	NA
1-PL-Piez-07	12/6/11	<1,030	ND	NA	NA	NA	NA
1-PL-Piez-27	12/6/11	<1,020	ND	NA	NA	NA	NA
1-PL-Piez-29	12/6/11	7,300	ND	NA	NA	NA	ND
1-PL-Piez-33	12/7/11	<1,040	ND	NA	NA	NA	ND
1-PL-Piez-34	12/7/11	<1,020	ND	NA	NA	NA	ND
1-PL-Piez-40	12/7/11	<1,030	ND	NA	NA	NA	ND
1-PL-Piez-41	12/7/11	<1,020	ND	NA	NA	NA	ND
1-PL-Piez-42	12/7/11	<1,020	ND	NA	NA	NA	ND

ND = No non-natural gamma emitting nuclides detected when analyzed to REMP LLDs.
NA = Analysis not required. TRU = Transuranics (Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240 and Pu-241)