

ENCLOSURE 1
2003 ANNUAL RADIOACTIVE EFFLUENT RELEASE
AND WASTE DISPOSAL REPORT
JANUARY 2003 – DECEMBER 2003

This report provides information relating to radioactive effluent releases and solid radioactive waste shipments at the Palisades Nuclear Plant during the period of January 1, 2003, through December 31, 2003. The report is required by 10 CFR 50.36a(a)(2) and Technical Specification 5.6.3. The report format is detailed in the Offsite Dose Calculation Manual (ODCM), Appendix A.

2003 Plant Operating History

Palisades went off-line on March 16, 2003, for a refueling outage. The unit returned to service on April 21, 2003, and remained in service for the rest of the year.

1. Supplemental Information

A. Batch Releases

Information related to batch release of gaseous and liquid effluents is provided in Attachment 1.

B. Abnormal releases

RV-1120 Release (CAP033556)

On February 21, 2003, at 2018 hours, an abnormal release of noble gas occurred in the auxiliary building when the relief valve (RV-1120) from waste gas decay tank T-68B was removed from service for maintenance. This relief valve exhausts to the waste gas header.

The source of the release was the waste gas surge tank, T-67. This tank had a higher than normal radioactivity content due to a recent plant power escalation. When the system was breached, gas flowed from the waste gas header into the auxiliary building, and was ultimately released through the plant stack system (as detected by the stack gas normal range noble gas monitor). A conservative estimate determined that a total of 3.72E-01 Curies were released. The resultant dose to the most conservative site boundary location was 2.63E-05 millirads beta air dose, and 8.85E-06 millirads gamma air dose. The release was quantified and documented in Stack Gas Analysis Record 03-009-ST.

C. Lower Limits of Detection (LLD's) for gaseous and liquid effluents are provided in Attachment 5.

D. Results of the 2003 Radiochemistry Cross Check Program with Analytics are shown in Attachment 6. Results were in agreement for all isotopes on all three detectors. There were a total of 272 measurements made.

E. Radioactive Effluent Monitoring Instrumentation

The ODCM, Appendix A, requires that any gaseous or liquid effluent monitor out of service for greater than 30 days be included in this effluent report. In 2003, no radioactive effluent monitoring instrument channels were inoperable for more than 30 days. However, RIA-2327, the high range noble gas channel (one of the channels associated with the stack gas effluent system) was out of service for 16 consecutive days in August 2003. As a result of this inoperability, a special report was submitted to the NRC detailing the cause of the event. This report was submitted on September 4, 2003, under docket 50-255.

2. Gaseous Effluents

Attachment 2 lists and summarizes all gaseous radioactive effluents released during the reporting period. The unidentified beta was $1.01\text{E-}05\%$ of the total release.

Gaseous effluents (noble gases) and resultant beta and gamma doses to the site boundary in 2003 were approximately 72% higher than the previous year. The total fission and activation gases released in 2003 were also 72% higher than that of 2002.

The higher gaseous effluent releases in 2003 were a result of the two fuel failures experienced in fuel cycle 16. The majority of the release occurred during the first quarter of the year during the containment purge activity at the start of the refueling outage. Organ dose (long-lived particulates and iodine) was 60% higher than 2002, due to the same factors that influenced the beta and gamma site boundary doses.

3. Liquid Effluents

Attachment 3 lists and summarizes all liquid radioactive effluents released during the reporting period. The unidentified beta was $1.48\text{E-}04\%$ of the total release.

Overall, whole body and organ dose from liquid effluents released during 2003 were 277% higher than those of 2002. Total release curies in 2003 were 686% higher than 2002, while liquid release volumes were nearly identical for both years.

The increased dose and curies released for 2003 was a result of the polishing demineralizer being out of service. Release tanks were not re-circulated through the demineralizer prior to release to further reduce activity concentration during the fourth quarter of 2003. The demineralizer has been returned to service and is available for processing tanks prior to release in 2004.

4. Estimate of Uncertainty

Both the Gaseous and Liquid Summation of Release data sheets include an estimate of the uncertainty associated with the measurement of radioactive effluents. These estimates are based on a statistical analysis of a series of sample results as described in the ODCM, Appendix A. These results are listed in the "Est Total Error %" columns on the Gaseous Summation Report (Attachment 2) and the Liquid Summation Report (Attachment 3).

5. Solid Waste

Attachment 4 summarizes all solid radwaste classification, sources, volume shipped, curie and nuclide content. Radwaste shipments were made either to Barnwell Waste Management Facility in Barnwell, South Carolina, or to Envirocare of Utah, Inc. In 2003, the waste volume and the curies shipped were lower than that of 2002. Less waste was shipped off site for processing, and very little resin waste was disposed of in 2002, accounting for the lower values in volume and curies.

6. Summary of Radiological Impact on Man

Potential doses to individuals and populations were calculated using GASPAR and LADTAP computer program codes. The quarterly values for curies released were input for each nuclide and summarized as follows:

- A. The maximum total body dose to an individual in unrestricted water-related exposure pathways was:

First Quarter -	2.49 E-04 millirem (adult)
Second Quarter -	3.92 E-04 millirem (adult)
Third Quarter -	7.31 E-08 millirem (adult)
Fourth Quarter -	6.49 E-04 millirem (teenage)

The maximum organ dose was:

First Quarter -	3.05 E-04 millirem (teenage bone)
Second Quarter -	5.02 E-04 millirem (teenage liver)
Third Quarter -	7.31 E-08 millirem (adult liver)
Fourth Quarter -	1.04 E-03 millirem (teenage bone)

B. The offsite air doses at site boundary (0.48 mi SSE) due to noble gases was:

First Quarter -	4.36 E-03 millirad beta and 1.44 E-03 millirad gamma
Second Quarter -	2.64 E-04 millirad beta and 5.41 E-05 millirad gamma
Third Quarter -	3.78 E-05 millirad beta and 1.12 E-05 millirad gamma
Fourth Quarter -	5.32 E-05 millirad beta and 1.78 E-05 millirad gamma

The maximum noble gas offsite air dose to the nearest residence (0.50 mi S) for beta and gamma occurred during the first quarter, 2.83 E-03 millirad and 9.33E-04 millirad respectively.

C. The most restrictive organ dose to an individual in an unrestricted area (based on identified critical receptors) from gaseous effluent releases were:

First Quarter -	3.09 E-02 millirem (infant thyroid)
Second Quarter -	1.55 E-02 millirem (infant thyroid)
Third Quarter -	5.66 E-03 millirem (child thyroid)
Fourth Quarter -	5.52 E-03 millirem (child thyroid)

D. Integrated total body doses to the general population and average doses to individuals within the population from liquid effluent release pathways to a distance of 50-miles from the site boundary were:

First Quarter -	1.90 E-03 person-rem and 1.44 E-06 millirem
Second Quarter -	2.62 E-03 person-rem and 1.98 E-06 millirem
Third Quarter -	8.55 E-07 person-rem and 6.48 E-10 millirem
Fourth Quarter -	2.92 E-03 person-rem and 2.21 E-06 millirem

E. Integrated total body doses to the general population and average doses to individuals within the population from gaseous effluent release pathways to a distance of 50 miles from the site boundary were:

First Quarter -	2.35 E-02 person-rem and 1.78 E-05 millirem
Second Quarter -	2.50 E-02 person-rem and 1.89 E-05 millirem
Third Quarter -	2.01 E-02 person-rem and 1.52 E-05 millirem
Fourth Quarter -	1.96 E-02 person-rem and 1.48 E-05 millirem

7. Process Control Program (PCP)

There were no changes made to the Process Control Program in 2003.

8. Offsite Dose Calculation Manual (ODCM)

The ODCM was revised in January 2003. Attachment 7 contains the ODCM, Revision 18, and the 50.59 review, per the requirements of Technical Specification 5.5.1.c.3.

Revision 18 to the ODCM involved changes as a result of use of the 2002 Land Use Survey. The Land Use Survey is used to ensure that effluent dose is calculated accurately. These changes maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR Part 50, and do not adversely impact the accuracy of effluent dose, or setpoint calculations.

The following tables were changed:

- 1) Update of Table 1.4, 2002 Palisades Land Use Census
- 2) Update of Table 1.4a, 2002 Palisades Land Use Census - Critical Receptor Items

ATTACHMENT 1

**RADIOACTIVE EFFLUENT RELEASE REPORT
BATCH RELEASES**

JANUARY – DECEMBER 2003

TABLE HP 10.5-1

**PALISADES PLANT RADIOACTIVE
EFFLUENT REPORT**

BATCH RELEASES

January 1, 2003 to December 31, 2003

GASEOUS	Units	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr
Number of Releases		7	12	5	3
Total Release Time	Minutes	693	1660	513	520
Maximum Release Time	Minutes	153	203	135	248
Average Release Time	Minutes	99	138	103	173
Minimum Release Time	Minutes	60	78	70	126

LIQUID	Units	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr
Number of Releases		1	2	0	1
Total Release Time	Minutes	542	988	N/A	552
Maximum Release Time	Minutes	542	516	N/A	552
Average Release Time	Minutes	542	494	N/A	552
Minimum Release Time	Minutes	542	472	N/A	552

ATTACHMENT 2

**RADIOACTIVE EFFLUENT RELEASE REPORT
GASEOUS EFFLUENTS – SUMMATION OF RELEASES**

JANUARY – DECEMBER 2003

3 Pages Follow

TABLE HP 10.5-2
PALISADES PLANT RADIOACTIVE
EFFLUENT REPORT

GASEOUS EFFLUENTS - SUMMATION OF RELEASES
 January 1, 2003 to December 31, 2003

A. FISSION & ACTIVATION GASES	Units	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	Est Total Error %
1. Total Release	Ci	6.07E+01	3.05E+00	4.96E-01	7.42E-01	5.57
2. Average release rate for Period	uCi/sec	7.81E+00	3.88E-01	6.23E-02	9.33E-02	
3. Percent of annual ave EC	%	3.27E-03	1.48E-04	2.82E-05	4.15E-05	
B. IODINES						
1. Total Iodine *	Ci	1.86E-03	8.78E-04	4.00E-04	3.53E-04	8.46
2. Average release rate for Period	uCi/sec	2.39E-04	1.12E-04	5.04E-05	4.44E-05	
3. Percent of annual ave EC	%	2.15E-04	1.02E-04	2.18E-05	1.90E-05	
C. PARTICULATES						
1. Particulates with half-life > than 8 days	Ci	8.28E-04	1.32E-04	1.42E-06	4.38E-07	7.89
2. Average release rate for Period	uCi/sec	1.06E-04	1.68E-05	1.79E-07	5.51E-08	
3. Percent of annual ave EC	%	5.28E-05	2.03E-05	6.34E-06	1.97E-06	
4. Gross ALPHA Radioactivity	Ci	4.20E-07	6.16E-07	5.86E-07	4.56E-07	
D. TRITIUM						
1. Total release	Ci	5.39E+00	6.43E+00	5.25E+00	5.16E+00	
2. Average release rate for Period	uCi/sec	6.93E-01	8.18E-01	6.60E-01	6.49E-01	
3. Percent of annual ave EC	%	1.47E-03	1.74E-03	1.40E-03	1.38E-03	
E. SITE BOUNDARY DOSE						
1. Beta Airdose at Site Boundary Due to Noble Gases (ODCM App A III.C)	mrad	4.36E-03	2.64E-04	3.78E-05	5.32E-05	
2. Percent limit	%	4.36E-02	2.64E-03	3.78E-04	5.32E-04	
3. Gamma Airdose at Site Boundary Due to Noble Gases (ODCM App A III.C)	mrad	1.44E-03	5.41E-05	1.12E-05	1.78E-05	
4. Percent limit	%	2.88E-02	1.08E-03	2.24E-04	3.56E-04	
F. ORGAN DOSE						
1. Maximum Organ Dose to Public Based on Critical Receptors (ODCM App A III.D)	mrem	3.09E-02	1.55E-02	5.66E-03	5.52E-03	
2. Percent limit	%	4.12E-01	2.07E-01	7.55E-02	7.36E-02	

* **NOTE:** Data is reported for I-131 and I-133 only.

TABLE HP 10.5-2

**PALISADES PLANT RADIOACTIVE
EFFLUENT REPORT**

GASEOUS EFFLUENTS

January 1, 2003 to December 31, 2003

1. FISSION GASES	Units	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr
Krypton-85	Ci	8.33E-01	7.75E-01	4.34E-02	1.26E-02
Krypton-87	Ci	<LLD	<LLD	2.50E-04	<LLD
Krypton-88	Ci	<LLD	<LLD	<LLD	<LLD
Xenon-131m	Ci	1.14E-02	9.13E-02	<LLD	<LLD
Xenon-133	Ci	5.98E+01	2.18E+00	4.47E-01	7.24E-01
Xenon-133m	Ci	<LLD	5.84E-04	<LLD	<LLD
Xenon-135	Ci	9.55E-02	1.81E-03	1.54E-03	1.65E-03
Xenon-135m	Ci	2.94E-03	2.24E-03	3.32E-03	3.63E-03
Xenon-138	Ci	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	6.07E+01	3.05E+00	4.96E-01	7.42E-01

2. IODINES	Units	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr
Iodine-131	Ci	1.51E-03	7.23E-04	1.03E-04	8.95E-05
Iodine-132	Ci	1.06E-05	1.34E-04	<LLD	<LLD
Iodine-133	Ci	3.46E-04	1.55E-04	2.97E-04	2.63E-04
Iodine-135	Ci	4.65E-06	<LLD	<LLD	<LLD
Total for Period	Ci	1.87E-03	1.01E-03	4.00E-04	3.53E-04

TABLE HP 10.5-2

**PALISADES PLANT RADIOACTIVE
EFFLUENT REPORT****GASEOUS EFFLUENTS**

January 1, 2003 to December 31, 2003

3. PARTICULATES*	Units	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr
Chromium-51	Ci	2.86E-04	<LLD	<LLD	<LLD
Manganese-54	Ci	1.88E-05	<LLD	<LLD	<LLD
Cobalt-58	Ci	3.62E-04	1.17E-04	<LLD	<LLD
Cobalt-60	Ci	4.14E-05	9.38E-06	<LLD	<LLD
Niobium-95	Ci	5.47E-05	1.80E-06	<LLD	<LLD
Ruthenium-103	Ci	8.88E-06	<LLD	<LLD	<LLD
Strontium-89	Ci	<LLD	<LLD	<LLD	<LLD
Strontium-90	Ci	<LLD	2.40E-07	6.70E-07	3.75E-07
Cesium-134	Ci	8.49E-08	<LLD	<LLD	<LLD
Cesium-137	Ci	9.57E-07	<LLD	<LLD	<LLD
Zirconium-95	Ci	5.17E-05	1.11E-06	<LLD	<LLD
Cobalt-57	Ci	<LLD	1.46E-07	<LLD	<LLD
Net unidentified beta	Ci	3.33E-06	2.42E-06	7.50E-07	6.30E-08
Total for Period	Ci	8.28E-04	1.32E-04	1.42E-06	4.38E-07

* Particulates with half-lives > 8 days

ATTACHMENT 3

**RADIOACTIVE EFFLUENT RELEASE REPORT
LIQUID EFFLUENTS – SUMMATION OF RELEASES**

JANUARY – DECEMBER 2003

2 Pages Follow

TABLE HP 10.5-3
PALISADES PLANT RADIOACTIVE
EFFLUENT REPORT

LIQUID EFFLUENTS - SUMMATION OF RELEASES
January 1, 2003 to December 31, 2003

A. FISSION & ACTIVATION PRODUCTS	Units	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	Est Total Error %
1. Total release (not including tritium, gases, alpha)	Ci	2.09E-04	5.40E-04	0.000	1.45E-03	14.16
2. Average release rate for Period	uCi/ml	8.25E-12	1.60E-11	N/A	3.75E-11	
3. Percent of EC	%	7.37E-04	8.89E-04	N/A	2.42E-03	
B. TRITIUM						
1. Total Release	Ci	5.87E+01	9.21E+01	5.57E-02	4.67E+01	4.01
2. Average diluted concentration during period	uCi/ml	2.32E-06	2.72E-06	1.39E-09	1.21E-06	
3. Percent of EC	%	2.32E-01	2.72E-01	1.39E-04	1.21E-01	
C. DISSOLVED & ENTRAINED GASES						
1. Total Release	Ci	0.000	0.000	0.000	0.000	N/A
2. Average diluted concentration during period	uCi/ml	N/A	N/A	N/A	N/A	
3. Percent of EC	%	N/A	N/A	N/A	N/A	
D. GROSS ALPHA RADIOACTIVITY (Total Release)	Ci	<LLD	8.30E-07	0.000	<LLD	
E. VOLUME OF WASTE RELEASED (Prior to Dillution)	Liters	1.79E+05	3.49E+05	0.000	1.79E+05	
F. VOLUME OF DILLUTION WATER USED DURING PERIOD	Liters	2.53E+10	3.38E+10	4.01E+10	3.86E+10	
G. MAXIMUM DOSE COMMITMENT - WHOLE BODY	mrem	2.49E-04	3.92E-04	7.31E-08	6.49E-04	
Percent of ODCM App A III. H limit	%	1.66E-02	2.61E-02	4.87E-06	4.33E-02	
H. MAXIMUM DOSE COMMITMENT - ORGAN	mrem	3.05E-04	5.02E-04	7.31E-08	1.04E-03	
Percent of ODCM App A III. H limit	%	6.10E-03	1.00E-02	1.46E-06	2.08E-02	

TABLE HP 10.5-3

**PALISADES PLANT RADIOACTIVE
EFFLUENT REPORT**

LIQUID EFFLUENTS
January 1, 2003 to December 31, 2003

NUCLIDES RELEASED	Units	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr
Manganese-54	Ci	<LLD	2.35E-05	<LLD	<LLD
Cobalt-58	Ci	<LLD	1.20E-04	<LLD	3.31E-04
Cobalt-60	Ci	1.16E-04	1.03E-04	<LLD	6.38E-04
Zirconium-95	Ci	<LLD	<LLD	<LLD	<LLD
Silver-110m	Ci	<LLD	<LLD	<LLD	<LLD
Strontium-89	Ci	<LLD	<LLD	<LLD	<LLD
Strontium-90	Ci	2.86E-06	1.03E-05	<LLD	2.86E-05
Cesium-134	Ci	<LLD	<LLD	<LLD	7.51E-05
Cesium-137	Ci	3.76E-05	1.37E-04	<LLD	1.84E-04
Iodine-131	Ci	<LLD	<LLD	<LLD	<LLD
Antimony-125	Ci	<LLD	9.76E-05	<LLD	<LLD
Net unidentified beta	Ci	5.22E-05	4.91E-05	<LLD	1.91E-04
Fission & Activation Products Total	Ci	2.09E-04	5.40E-04	0.0	1.45E-03
Tritium	Ci	5.87E+01	9.21E+01	5.57E-02	4.67E+01
Grand Total	Ci	5.87E+01	9.21E+01	5.57E-02	4.67E+01

ATTACHMENT 4

**RADIOACTIVE EFFLUENT RELEASE REPORT
SOLID WASTE**

JANUARY – DECEMBER 2003

SOLID WASTE

January 1, 2003 to December 31, 2003

Waste Class	Source of Waste	Solidification Agent	Container Type	Volume (ft ³)	Total Curies	Principal Radionuclides
AS	Evap Bottoms	N/A	HIC	102.4	1.877	Co-60, Cs-137, Sb-125, Ni-63, Cs-134, Mn-54, Co-58, Fe-55, Ag-110m, Ru-106
AS	DAW	N/A	HIC	194.1	0.726	Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55
C	Resin	N/A	HIC	9.3	6.23	Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55, Cs-134, Zn-65, H-3
C	Filters	N/A	HIC	170.8	3.287	Co-60, Ag-110m, Mn-54, Cs-137, Cs-134, Ni-63, Fe-55, H-3
AU	DAW	N/A	LSA	557.4	0.370	Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55, Ru-106, Pu-241
			TOTAL	1034.0 ft³	12.49 Ci	

ATTACHMENT 5

**RADIOACTIVE EFFLUENT RELEASE REPORT
LOWER LIMITS OF DETECTION FOR PALISADES EFFLUENTS**

JANUARY – DECEMBER 2003

LOWER LIMITS OF DETECTION (LLDs) FOR PALISADES EFFLUENTS

<u>Gaseous Effluents</u>	<u>Nuclide</u>	<u>LLD (uCi/cc)*</u>
	<u>Mn-54</u>	<u>3.57E-14</u>
	<u>Co-58</u>	<u>2.95E-14</u>
	<u>Fe-59</u>	<u>6.17E-14</u>
	<u>Co-60</u>	<u>4.81E-14</u>
03-001-St	<u>Zn-65</u>	<u>8.52E-14</u>
03-012-St	<u>Zr-95</u>	<u>4.07E-14</u>
03-002-G	<u>Mo-99</u>	<u>2.69E-13</u>
03-040-G	<u>I-131</u>	<u>2.38E-14</u>
	<u>I-133</u>	<u>2.61E-14</u>
	<u>Cs-134</u>	<u>2.50E-14</u>
	<u>Cs-137</u>	<u>4.03E-14</u>
	<u>Ce-141</u>	<u>2.44E-14</u>
	<u>Ce-144</u>	<u>1.02E-13</u>
	<u>Kr-87</u>	<u>7.64E-07</u>
	<u>Kr-88</u>	<u>8.35E-07</u>
	<u>Xe-133</u>	<u>1.15E-06</u>
	<u>Xe-133m</u>	<u>2.41E-06</u>
	<u>Xe-135</u>	<u>2.50E-07</u>
	<u>Xe-138</u>	<u>1.89E-06</u>

<u>Liquid Effluents</u>	<u>Nuclide</u>	<u>LLD (uCi/ml)**</u>
	<u>Mn-54</u>	<u>2.18E-07</u>
	<u>Fe-59</u>	<u>3.19E-07</u>
	<u>Co-58</u>	<u>1.02E-07</u>
	<u>Co-60</u>	<u>8.71E-08</u>
	<u>Zn-65</u>	<u>3.14E-07</u>
Liquid Batch Release	<u>Mo-99</u>	<u>1.11E-06</u>
03-001-R	<u>I-131</u>	<u>9.72E-08</u>
03-005-R	<u>Cs-134</u>	<u>1.82E-07</u>
	<u>Cs-137</u>	<u>1.08E-07</u>
	<u>Ce-141</u>	<u>1.40E-07</u>
	<u>Ce-144</u>	<u>5.99E-07</u>

* From a typical Stack release analysis.

** From a typical Liquid release analysis.

ATTACHMENT 6

**RADIOACTIVE EFFLUENT RELEASE REPORT
RESULTS OF 2003 RADIOCHEMISTRY CROSS CHECK PROGRAM**

**NOTE: THERE WAS NO CROSS CHECK PROGRAM PERFORMED FOR THE
FIRST QUARTER 2003**



ANALYTIX

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677

Fax (404) 352-2837

RESULTS OF RADIOCHEMISTRY

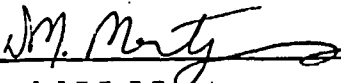
CROSS CHECK PROGRAM

CONSUMERS POWER COMPANY

PALISADES

AMENDED REPORT

SECOND QUARTER 2003

 11-10-03
Daniel M. Montgomery, QA Manager

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO	RESOLUTION	COMPARISON
		VALUE microCi	VALUE microCi	PALISADES: ANALYTICS		

A16773-66	Ce-141	6.48E-05	6.77E-05	0.96	20	AGREEMENT
SOLID	Cr-51	6.26E-05	6.31E-05	0.99	20	AGREEMENT
DET. 1	Cs-134	1.38E-05	1.43E-05	0.97	20	AGREEMENT
	Cs-137	3.10E-05	3.10E-05	1.00	20	AGREEMENT
	Co-58	1.63E-05	1.63E-05	1.00	20	AGREEMENT
	Mn-54	2.70E-05	2.66E-05	1.02	20	AGREEMENT
	Fe-59	2.00E-05	2.03E-05	0.99	20	AGREEMENT
	Zn-65	2.61E-05	2.64E-05	0.99	20	AGREEMENT
	Co-60	1.78E-05	1.78E-05	1.00	20	AGREEMENT

A16773-66	Ce-141	6.41E-05	6.77E-05	0.95	20	AGREEMENT
SOLID	Cr-51	5.40E-05	6.31E-05	0.86	20	AGREEMENT
DET. 2	Cs-134	1.24E-05	1.43E-05	0.87	20	AGREEMENT
	Cs-137	2.74E-05	3.10E-05	0.88	20	AGREEMENT
	Co-58	1.39E-05	1.63E-05	0.85	20	AGREEMENT
	Mn-54	2.32E-05	2.66E-05	0.87	20	AGREEMENT
	Fe-59	1.74E-05	2.03E-05	0.86	20	AGREEMENT
	Zn-65	2.31E-05	2.64E-05	0.88	20	AGREEMENT
	Co-60	1.48E-05	1.78E-05	0.83	20	AGREEMENT

A16773-66	Ce-141	6.18E-05	6.77E-05	0.91	20	AGREEMENT
SOLID	Cr-51	5.82E-05	6.31E-05	0.92	20	AGREEMENT
DET. 3	Cs-134	1.30E-05	1.43E-05	0.91	20	AGREEMENT
	Cs-137	2.85E-05	3.10E-05	0.92	20	AGREEMENT
	Co-58	1.40E-05	1.63E-05	0.86	20	AGREEMENT
	Mn-54	2.49E-05	2.66E-05	0.94	20	AGREEMENT
	Fe-59	1.76E-05	2.03E-05	0.87	20	AGREEMENT
	Zn-65	2.52E-05	2.64E-05	0.96	20	AGREEMENT
	Co-60	1.72E-05	1.78E-05	0.97	20	AGREEMENT

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO		COMPARISON
		VALUE microCi	VALUE microCi	PALISADES: ANALYTICS	RESOLUTION	

A16774-66	Ce-141	6.98E-05	6.76E-05	1.03	20	AGREEMENT
SIMULATED	Cr-51	6.15E-05	6.31E-05	0.98	20	AGREEMENT
DET. 1	Cs-134	1.40E-05	1.43E-05	0.98	20	AGREEMENT
	Cs-137	3.22E-05	3.10E-05	1.04	20	AGREEMENT
	Co-58	1.72E-05	1.63E-05	1.05	20	AGREEMENT
	Mn-54	2.80E-05	2.65E-05	1.06	20	AGREEMENT
	Fe-59	2.21E-05	2.03E-05	1.09	20	AGREEMENT
	Zn-65	2.84E-05	2.64E-05	1.08	20	AGREEMENT
	Co-60	1.86E-05	1.78E-05	1.05	20	AGREEMENT

A16774-66	Ce-141	6.67E-05	6.76E-05	0.99	20	AGREEMENT
SIMULATED	Cr-51	6.22E-05	6.31E-05	0.99	20	AGREEMENT
DET. 2	Cs-134	1.30E-05	1.43E-05	0.91	20	AGREEMENT
	Cs-137	2.96E-05	3.10E-05	0.96	20	AGREEMENT
	Co-58	1.44E-05	1.63E-05	0.88	20	AGREEMENT
	Mn-54	2.38E-05	2.65E-05	0.90	20	AGREEMENT
	Fe-59	1.80E-05	2.03E-05	0.89	20	AGREEMENT
	Zn-65	2.38E-05	2.64E-05	0.90	20	AGREEMENT
	Co-60	1.61E-05	1.78E-05	0.91	20	AGREEMENT

A16774-66	Ce-141	6.30E-05	6.76E-05	0.93	20	AGREEMENT
SIMULATED	Cr-51	6.08E-05	6.31E-05	0.96	20	AGREEMENT
DET. 3	Cs-134	1.34E-05	1.43E-05	0.94	20	AGREEMENT
	Cs-137	3.01E-05	3.10E-05	0.97	20	AGREEMENT
	Co-58	1.58E-05	1.63E-05	0.97	20	AGREEMENT
	Mn-54	2.62E-05	2.65E-05	0.99	20	AGREEMENT
	Fe-59	2.00E-05	2.03E-05	0.99	20	AGREEMENT
	Zn-65	2.46E-05	2.64E-05	0.93	20	AGREEMENT
	Co-60	1.72E-05	1.78E-05	0.97	20	AGREEMENT

2ND QUARTER 2003 (AMENDED REPORT)

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO	RESOLUTION	COMPARISON
		VALUE microCi	VALUE microCi	PALISADES: ANALYTICS		

A16775-66	Ce-141	5.68E-04	5.67E-04	1.00	20	AGREEMENT
SOLID	Cr-51	5.35E-04	5.28E-04	1.01	20	AGREEMENT
DET. 1	Cs-134	1.17E-04	1.20E-04	0.98	20	AGREEMENT
	Cs-137	2.71E-04	2.60E-04	1.04	20	AGREEMENT
	Co-58	1.44E-04	1.37E-04	1.05	20	AGREEMENT
	Mn-54	2.36E-04	2.22E-04	1.06	20	AGREEMENT
	Fe-59	1.80E-04	1.70E-04	1.06	20	AGREEMENT
	Zn-65	2.26E-04	2.21E-04	1.02	20	AGREEMENT
	Co-60	1.53E-04	1.49E-04	1.03	20	AGREEMENT

A16775-66	Ce-141	5.46E-04	5.67E-04	0.96	20	AGREEMENT
SOLID	Cr-51	5.32E-04	5.28E-04	1.01	20	AGREEMENT
DET. 2	Cs-134	1.08E-04	1.20E-04	0.90	20	AGREEMENT
	Cs-137	2.49E-04	2.60E-04	0.96	20	AGREEMENT
	Co-58	1.28E-04	1.37E-04	0.94	20	AGREEMENT
	Mn-54	2.00E-04	2.22E-04	0.90	20	AGREEMENT
	Fe-59	1.46E-04	1.70E-04	0.86	20	AGREEMENT
	Zn-65	1.95E-04	2.21E-04	0.88	20	AGREEMENT
	Co-60	1.29E-04	1.49E-04	0.87	20	AGREEMENT

A16775-66	Ce-141	4.92E-04	5.67E-04	0.87	20	AGREEMENT
SOLID	Cr-51	4.62E-04	5.28E-04	0.87	20	AGREEMENT
DET. 3	Cs-134	1.02E-04	1.20E-04	0.85	20	AGREEMENT
	Cs-137	2.47E-04	2.60E-04	0.95	20	AGREEMENT
	Co-58	1.26E-04	1.37E-04	0.92	20	AGREEMENT
	Mn-54	2.06E-04	2.22E-04	0.93	20	AGREEMENT
	Fe-59	1.52E-04	1.70E-04	0.90	20	AGREEMENT
	Zn-65	2.06E-04	2.21E-04	0.93	20	AGREEMENT
	Co-60	1.37E-04	1.49E-04	0.92	20	AGREEMENT

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO		COMPARISON
		VALUE microCi	VALUE microCi	PALISADES: ANALYTICS	RESOLUTION	

A16776-66	Ce-141	6.74E-02	6.41E-02	1.05	20	AGREEMENT
FILTER	Cr-51	6.21E-02	5.98E-02	1.04	20	AGREEMENT
DET. 1	Cs-134	1.29E-02	1.35E-02	0.95	20	AGREEMENT
	Cs-137	3.24E-02	2.94E-02	1.10	20	AGREEMENT
	Co-58	1.68E-02	1.55E-02	1.09	20	AGREEMENT
	Mn-54	2.82E-02	2.51E-02	1.12	20	AGREEMENT
	Fe-59	2.16E-02	1.92E-02	1.12	20	AGREEMENT
	Zn-65	2.83E-02	2.50E-02	1.13	20	AGREEMENT
	Co-60	1.82E-02	1.68E-02	1.08	20	AGREEMENT

A16776-66	Ce-141	6.42E-02	6.41E-02	1.00	20	AGREEMENT
FILTER	Cr-51	5.66E-02	5.98E-02	0.95	20	AGREEMENT
DET. 2	Cs-134	1.18E-02	1.35E-02	0.87	20	AGREEMENT
	Cs-137	2.94E-02	2.94E-02	1.00	20	AGREEMENT
	Co-58	1.55E-02	1.55E-02	1.00	20	AGREEMENT
	Mn-54	2.51E-02	2.51E-02	1.00	20	AGREEMENT
	Fe-59	1.86E-02	1.92E-02	0.97	20	AGREEMENT
	Zn-65	2.55E-02	2.50E-02	1.02	20	AGREEMENT
	Co-60	1.62E-02	1.68E-02	0.96	20	AGREEMENT

A16776-66	Ce-141	5.84E-02	6.41E-02	0.91	20	AGREEMENT
FILTER	Cr-51	5.52E-02	5.98E-02	0.92	20	AGREEMENT
DET. 3	Cs-134	1.20E-02	1.35E-02	0.89	20	AGREEMENT
	Cs-137	2.88E-02	2.94E-02	0.98	20	AGREEMENT
	Co-58	1.48E-02	1.55E-02	0.96	20	AGREEMENT
	Mn-54	2.52E-02	2.51E-02	1.00	20	AGREEMENT
	Fe-59	1.91E-02	1.92E-02	0.99	20	AGREEMENT
	Zn-65	2.54E-02	2.50E-02	1.02	20	AGREEMENT
	Co-60	1.58E-02	1.68E-02	0.94	20	AGREEMENT

2ND QUARTER 2003 (AMENDED REPORT)



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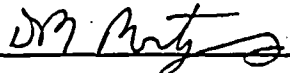
RESULTS OF RADIOCHEMISTRY

CROSS CHECK PROGRAM

CONSUMERS POWER COMPANY

PALISADES NUCLEAR PLANT

THIRD QUARTER 2003

 11-10-03
Daniel M. Montgomery, QA Manager

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO		COMPARISON
		VALUE microCi	VALUE microCi	PALISADES: ANALYTICS	RESOLUTION	

A17293-66	Ce-141	3.37E-02	3.22E-02	1.05	20	AGREEMENT
CARTRIDGE	Cr-51	1.03E-01	9.93E-02	1.04	20	AGREEMENT
DET. 1	Cs-134	2.14E-02	2.24E-02	0.95	20	AGREEMENT
	Cs-137	1.80E-02	1.61E-02	1.12	20	AGREEMENT
	Co-58	2.64E-02	2.50E-02	1.05	20	AGREEMENT
	Mn-54	2.11E-02	1.83E-02	1.15	20	AGREEMENT
	Fe-59	2.77E-02	2.43E-02	1.14	20	AGREEMENT
	Zn-65	3.97E-02	3.52E-02	1.13	20	AGREEMENT
	Co-60	2.48E-02	2.27E-02	1.09	20	AGREEMENT

A17293-66	Ce-141	3.18E-02	3.22E-02	0.99	20	AGREEMENT
CARTRIDGE	Cr-51	8.91E-02	9.93E-02	0.90	20	AGREEMENT
DET. 2	Cs-134	1.88E-02	2.24E-02	0.84	20	AGREEMENT
	Cs-137	1.58E-02	1.61E-02	0.98	20	AGREEMENT
	Co-58	2.32E-02	2.50E-02	0.93	20	AGREEMENT
	Mn-54	1.78E-02	1.83E-02	0.97	20	AGREEMENT
	Fe-59	2.28E-02	2.43E-02	0.94	20	AGREEMENT
	Zn-65	3.46E-02	3.52E-02	0.98	20	AGREEMENT
	Co-60	2.08E-02	2.27E-02	0.92	20	AGREEMENT

A17293-66	Ce-141	2.76E-02	3.22E-02	0.86	20	AGREEMENT
CARTRIDGE	Cr-51	8.60E-02	9.93E-02	0.87	20	AGREEMENT
DET. 3	Cs-134	1.89E-02	2.24E-02	0.84	20	AGREEMENT
	Cs-137	1.52E-02	1.61E-02	0.95	20	AGREEMENT
	Co-58	2.28E-02	2.50E-02	0.91	20	AGREEMENT
	Mn-54	1.76E-02	1.83E-02	0.96	20	AGREEMENT
	Fe-59	2.36E-02	2.43E-02	0.97	20	AGREEMENT
	Zn-65	3.33E-02	3.52E-02	0.95	20	AGREEMENT
	Co-60	2.14E-02	2.27E-02	0.94	20	AGREEMENT

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO		COMPARISON
		VALUE microCi	VALUE microCi	PALISADES: ANALYTICS	RESOLUTION	

A17294-66	Ce-141	6.16E-04	6.50E-04	0.95	20	AGREEMENT
SIMULATED	Cr-51	1.87E-03	2.00E-03	0.93	20	AGREEMENT
DET. 1	Cs-134	3.86E-04	4.52E-04	0.85	20	AGREEMENT
	Cs-137	3.16E-04	3.24E-04	0.97	20	AGREEMENT
	Co-58	4.88E-04	5.05E-04	0.97	20	AGREEMENT
	Mn-54	3.84E-04	3.69E-04	1.04	20	AGREEMENT
	Fe-59	5.18E-04	4.91E-04	1.06	20	AGREEMENT
	Zn-65	7.32E-04	7.10E-04	1.03	20	AGREEMENT
	Co-60	4.58E-04	4.58E-04	1.00	20	AGREEMENT

A17294-66	Ce-141	6.04E-04	6.50E-04	0.93	20	AGREEMENT
SIMULATED	Cr-51	1.76E-03	2.00E-03	0.88	20	AGREEMENT
DET. 2	Cs-134	3.51E-04	4.52E-04	0.78	20	AGREEMENT
	Cs-137	2.86E-04	3.24E-04	0.88	20	AGREEMENT
	Co-58	4.56E-04	5.05E-04	0.90	20	AGREEMENT
	Mn-54	3.43E-04	3.69E-04	0.93	20	AGREEMENT
	Fe-59	4.40E-04	4.91E-04	0.90	20	AGREEMENT
	Zn-65	6.27E-04	7.10E-04	0.88	20	AGREEMENT
	Co-60	3.94E-04	4.58E-04	0.86	20	AGREEMENT

A17294-66	Ce-141	5.54E-04	6.50E-04	0.85	20	AGREEMENT
SIMULATED	Cr-51	1.66E-03	2.00E-03	0.83	20	AGREEMENT
DET. 3	Cs-134	3.64E-04	4.52E-04	0.81	20	AGREEMENT
	Cs-137	2.92E-04	3.24E-04	0.90	20	AGREEMENT
	Co-58	4.52E-04	5.05E-04	0.90	20	AGREEMENT
	Mn-54	3.45E-04	3.69E-04	0.94	20	AGREEMENT
	Fe-59	4.52E-04	4.91E-04	0.92	20	AGREEMENT
	Zn-65	6.40E-04	7.10E-04	0.90	20	AGREEMENT
	Co-60	4.18E-04	4.58E-04	0.91	20	AGREEMENT

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO		COMPARISON
		VALUE microCi	VALUE microCi	PALISADES: ANALYTICS	RESOLUTION	

A17295-66	Ce-141	3.44E-05	3.26E-05	1.06	20	AGREEMENT
SAND	Cr-51	1.06E-04	1.00E-04	1.06	20	AGREEMENT
DET. 1	Cs-134	2.22E-05	2.27E-05	0.98	20	AGREEMENT
	Cs-137	1.76E-05	1.63E-05	1.08	20	AGREEMENT
	Co-58	2.58E-05	2.53E-05	1.02	20	AGREEMENT
	Mn-54	2.00E-05	1.85E-05	1.08	20	AGREEMENT
	Fe-59	2.68E-05	2.46E-05	1.09	20	AGREEMENT
	Zn-65	3.78E-05	3.56E-05	1.06	20	AGREEMENT
	Co-60	2.39E-05	2.30E-05	1.04	20	AGREEMENT

A17295-66	Ce-141	3.05E-05	3.26E-05	0.94	20	AGREEMENT
SAND	Cr-51	9.13E-05	1.00E-04	0.91	20	AGREEMENT
DET. 2	Cs-134	1.90E-05	2.27E-05	0.84	20	AGREEMENT
	Cs-137	1.56E-05	1.63E-05	0.96	20	AGREEMENT
	Co-58	2.24E-05	2.53E-05	0.88	20	AGREEMENT
	Mn-54	1.73E-05	1.85E-05	0.94	20	AGREEMENT
	Fe-59	2.20E-05	2.46E-05	0.89	20	AGREEMENT
	Zn-65	3.10E-05	3.56E-05	0.87	20	AGREEMENT
	Co-60	2.06E-05	2.30E-05	0.90	20	AGREEMENT

A17295-66	Ce-141	2.84E-05	3.26E-05	0.87	20	AGREEMENT
SAND	Cr-51	9.05E-05	1.00E-04	0.90	20	AGREEMENT
DET. 3	Cs-134	2.00E-05	2.27E-05	0.88	20	AGREEMENT
	Cs-137	1.60E-05	1.63E-05	0.98	20	AGREEMENT
	Co-58	2.32E-05	2.53E-05	0.92	20	AGREEMENT
	Mn-54	1.82E-05	1.85E-05	0.98	20	AGREEMENT
	Fe-59	2.12E-05	2.46E-05	0.86	20	AGREEMENT
	Zn-65	3.37E-05	3.56E-05	0.95	20	AGREEMENT
	Co-60	2.14E-05	2.30E-05	0.93	20	AGREEMENT

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO	RESOLUTION	COMPARISON
		VALUE microCi	VALUE microCi	PALISADES: ANALYTICS		

A17296A-66	Ce-141	3.14E-02	3.22E-02	0.98	20	AGREEMENT
CARTRIDGE	Cr-51	9.81E-02	9.92E-02	0.99	20	AGREEMENT
DET. 1	Cs-134	2.06E-02	2.24E-02	0.92	20	AGREEMENT
	Cs-137	1.74E-02	1.60E-02	1.08	20	AGREEMENT
	Co-58	2.59E-02	2.50E-02	1.04	20	AGREEMENT
	Mn-54	2.04E-02	1.83E-02	1.12	20	AGREEMENT
	Fe-59	2.60E-02	2.43E-02	1.07	20	AGREEMENT
	Zn-65	3.83E-02	3.51E-02	1.09	20	AGREEMENT
	Co-60	2.40E-02	2.27E-02	1.06	20	AGREEMENT

A17296A-66	Ce-141	3.04E-02	3.22E-02	0.94	20	AGREEMENT
CARTRIDGE	Cr-51	8.96E-02	9.92E-02	0.90	20	AGREEMENT
DET. 2	Cs-134	1.84E-02	2.24E-02	0.82	20	AGREEMENT
	Cs-137	1.54E-02	1.60E-02	0.96	20	AGREEMENT
	Co-58	2.24E-02	2.50E-02	0.90	20	AGREEMENT
	Mn-54	1.76E-02	1.83E-02	0.96	20	AGREEMENT
	Fe-59	2.30E-02	2.43E-02	0.95	20	AGREEMENT
	Zn-65	3.30E-02	3.51E-02	0.94	20	AGREEMENT
	Co-60	2.03E-02	2.27E-02	0.90	20	AGREEMENT

A17296A-66	Ce-141	2.74E-02	2.51E-02	1.09	20	AGREEMENT
CARTRIDGE	Cr-51	8.44E-02	7.73E-02	1.09	20	AGREEMENT
DET. 3	Cs-134	1.88E-02	1.74E-02	1.08	20	AGREEMENT
	Cs-137	1.50E-02	1.25E-02	1.20	20	AGREEMENT
	Co-58	2.22E-02	1.95E-02	1.14	20	AGREEMENT
	Mn-54	1.75E-02	1.42E-02	1.23	20	AGREEMENT
	Fe-59	2.34E-02	1.89E-02	1.24	20	AGREEMENT
	Zn-65	3.32E-02	2.74E-02	1.21	20	AGREEMENT
	Co-60	2.06E-02	1.77E-02	1.17	20	AGREEMENT


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RESULTS OF RADIOCHEMISTRY
CROSS CHECK PROGRAM
NUCLEAR MANAGEMENT COMPANY
PALISADES PLANT

FOURTH QUARTER 2003



Daniel M. Montgomery, QA Manager

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO		COMPARISON
		VALUE microCi/cc	VALUE microCi/cc	ANALYTICS	RESOLUTION	

A17597-66	Ce-141	5.61E-02	5.21E-02	1.08	20	AGREEMENT
RGEM	Cr-51	8.75E-02	8.00E-02	1.09	20	AGREEMENT
CARTRIDGE	Cs-134	2.03E-02	2.02E-02	1.00	20	AGREEMENT
DET. 1	Cs-137	2.16E-02	1.88E-02	1.15	20	AGREEMENT
	Co-58	2.36E-02	2.09E-02	1.13	20	AGREEMENT
	Mn-54	3.05E-02	2.67E-02	1.14	20	AGREEMENT
	Fe-59	2.67E-02	2.26E-02	1.18	20	AGREEMENT
	Zn-65	3.55E-02	3.09E-02	1.15	20	AGREEMENT
	Co-60	2.34E-02	2.33E-02	1.00	20	AGREEMENT

A17597-66	Ce-141	5.16E-02	5.21E-02	0.99	20	AGREEMENT
RGEM	Cr-51	7.74E-02	8.00E-02	0.97	20	AGREEMENT
CARTRIDGE	Cs-134	1.82E-02	2.02E-02	0.90	20	AGREEMENT
DET. 2	Cs-137	1.85E-02	1.88E-02	0.98	20	AGREEMENT
	Co-58	2.07E-02	2.09E-02	0.99	20	AGREEMENT
	Mn-54	2.68E-02	2.67E-02	1.00	20	AGREEMENT
	Fe-59	2.26E-02	2.26E-02	1.00	20	AGREEMENT
	Zn-65	2.92E-02	3.09E-02	0.94	20	AGREEMENT
	Co-60	2.04E-02	2.33E-02	0.88	20	AGREEMENT

A17597-66	Ce-141	4.65E-02	5.21E-02	0.89	20	AGREEMENT
RGEM	Cr-51	7.34E-02	8.00E-02	0.92	20	AGREEMENT
CARTRIDGE	Cs-134	1.78E-02	2.02E-02	0.88	20	AGREEMENT
DET. 3	Cs-137	1.82E-02	1.88E-02	0.97	20	AGREEMENT
	Co-58	2.03E-02	2.09E-02	0.97	20	AGREEMENT
	Mn-54	2.61E-02	2.67E-02	0.98	20	AGREEMENT
	Fe-59	2.23E-02	2.26E-02	0.99	20	AGREEMENT
	Zn-65	2.96E-02	3.09E-02	0.96	20	AGREEMENT
	Co-60	2.06E-02	2.33E-02	0.88	20	AGREEMENT

SAMPLE	ANALYSIS	PALISADES	ANALYTICS	RATIO		COMPARISON
		VALUE microCi/cc	VALUE microCi/cc	ANALYTICS	RESOLUTION	

A17598A-66	Ce-141	1.48E-03	1.44E-03	1.02	20	AGREEMENT
SOLID	Cr-51	2.05E-03	2.22E-03	0.92	20	AGREEMENT
7.2 mL	Cs-134	5.86E-04	5.59E-04	1.05	20	AGREEMENT
BOMB	Cs-137	5.62E-04	5.22E-04	1.08	20	AGREEMENT
	Co-58	6.15E-04	5.80E-04	1.06	20	AGREEMENT
	Mn-54	7.97E-04	7.40E-04	1.08	20	AGREEMENT
	Fe-59	7.22E-04	6.27E-04	1.15	20	AGREEMENT
	Zn-65	8.04E-04	8.57E-04	0.94	20	AGREEMENT
	Co-60	6.02E-04	6.45E-04	0.93	20	AGREEMENT

A17598A-66	Ce-141	1.35E-03	1.44E-03	0.94	20	AGREEMENT
SOLID	Cr-51	1.70E-03	2.22E-03	0.77	20	AGREEMENT
7.2 mL	Cs-134	4.78E-04	5.59E-04	0.85	20	AGREEMENT
BOMB	Cs-137	4.70E-04	5.22E-04	0.90	20	AGREEMENT
	Co-58	5.03E-04	5.80E-04	0.87	20	AGREEMENT
	Mn-54	6.14E-04	7.40E-04	0.83	20	AGREEMENT
	Fe-59	5.93E-04	6.27E-04	0.95	20	AGREEMENT
	Zn-65	7.92E-04	8.57E-04	0.92	20	AGREEMENT
	Co-60	4.78E-04	6.45E-04	0.74	20	AGREEMENT

A17598A-66	Ce-141	1.34E-03	1.44E-03	0.93	20	AGREEMENT
SOLID	Cr-51	2.30E-03	2.22E-03	1.04	20	AGREEMENT
7.2 mL	Cs-134	5.91E-04	5.59E-04	1.06	20	AGREEMENT
BOMB	Cs-137	5.26E-04	5.22E-04	1.01	20	AGREEMENT
	Co-58	6.44E-04	5.80E-04	1.11	20	AGREEMENT
	Mn-54	7.16E-04	7.40E-04	0.97	20	AGREEMENT
	Fe-59	6.36E-04	6.27E-04	1.01	20	AGREEMENT
	Zn-65	7.91E-04	8.57E-04	0.92	20	AGREEMENT
	Co-60	5.96E-04	6.45E-04	0.92	20	AGREEMENT

SAMPLE	ANALYSIS	PALISADES VALUE microCi/cc	ANALYTICS VALUE microCi/cc	RATIO ANALYTICS	RESOLUTION	COMPARISON
A17599-66	Gross Beta	3.68E-03	3.66E-03	1.01	17	AGREEMENT
LIQUID						
A17600-66	Tritium	1.30E-03	1.42E-03	0.91	12.5	AGREEMENT
LIQUID						