Entergy

Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043
Tel 269 764 2000

Paula K. Anderson
Licensing Manager

April 30, 2010

10 CFR 50.36a

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: 2009 Annual Radioactive Effluent Release and Waste Disposal Report

Palisades Nuclear Plant	Big Rock Point
Docket 50-255	Dockets 50-155 and 72-043
License No. DPR-20	License No. DPR-6

Dear Sir or Madam:

Attached are the Entergy Nuclear Operations, Inc. 2009 Annual Radioactive Effluent Release and Waste Disposal Reports for Palisades Nuclear Plant (PNP) and Big Rock Point (BRP) Independent Spent Fuel Storage Installation (ISFSI). These reports are submitted in accordance with 10 CFR 50.36a(a)(2).

Attachment 1 contains the report for PNP. Attachment 2 contains the report for the BRP ISFSI.

These reports provide a summary of the quantities of radioactive liquid and gaseous effluent releases and solid radioactive waste processed during the period of January 1, 2009, through December 31, 2009.

This letter contains no new commitments and no revision to existing commitments.

Sincerely,

pka/bed

Attachment 1: Palisades Nuclear Plant 2009 Radioactive Effluent Release Report
Attachment 2: Big Rock Point Independent Spent Fuel Storage Installation 2009 Radioactive Effluent Release Report

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC
NRC NMSS Project Manager

IE48
IE17
NMSS01
NRR/ESME

ATTACHMENT 1
PALISADES NUCLEAR PLANT
2009 RADIOACTIVE EFFLUENT RELEASE REPORT

2009 Plant Operating History

Palisades Nuclear Plant (PNP) was on line on January 1, 2009. PNP was taken off line on February 17, 2009, due to excessive control rod drive mechanism leakage. The plant was returned to service on February 21, 2009. PNP was taken off line on March 22, 2009, for a refueling outage, and was returned to service on May 2, 2009. PNP remained on line for the remainder of 2009.

A. Gaseous Effluents

Tables A-1, "Gaseous Effluents – Summation of All Discharges," A-1A, "Gaseous Effluents – Ground-Level Release – Batch Mode," and A-1B, "Gaseous Effluents – Ground-Level Release – Continuous Mode," list and summarize gaseous effluents released during this reporting period.

B. Liquid Effluents

Tables A-2, "Liquid Effluents – Summation of All Discharges," A-2A, "Liquid Effluents – Batch Mode," and A-2B, "Liquid Effluents – Continuous Mode," list and summarize liquid effluents released during this reporting period.

C. Solid Waste Storage and Shipments

Table A-3, "Low-Level Waste for Waste Classification A, B and C, summarizes solid radioactive waste shipped for processing or burial in 2009 for the following waste streams: resins, filters and evaporator bottoms, dry active waste, irradiated components, other waste, and sum of all waste.

D. Dose Assessments

Tables A-4, "Dose Assessments, 10 CFR Part 50, Appendix I," and A-5, "EPA 40 CFR Part 190, Individual in the Unrestricted Area," lists annual dose to the members of the public.

E. Supplemental Information

1. Abnormal Discharges

In December 2007, tritium was detected in a groundwater monitoring well at a level of 22,000 pCi/L. The source of the activity is leakage associated with T-91, the utility water storage tank, and associated piping. T-91 is used to store processed liquid waste prior to discharge. No radionuclides other than tritium have been detected in the groundwater. Tritium is still being released to the environment (Lake Michigan) via an unmonitored pathway, as

demonstrated by the continued detection of monitoring well sample activity. A definitive release rate or total activity released cannot be determined. Conservatively, the same upper limit of 1% estimate of total tritium activity released via batch releases that was used in 2007 and 2008 will be used for 2009 effluent calculations.

Date and Duration – Tritium was first detected in a monitoring well in December 2007 and release to the environment is still occurring.

Location – The location is between the northwest corner of the auxiliary building and Lake Michigan; the plume roughly paralleling piping associated with T-91.

Volume – The volume release is conservatively estimated at 1% of liquid radioactive waste discharge volume – 7698 gallons.

Estimated Activity of Each Radionuclide – 2.943 curies of tritium

Effluent Monitoring Results – N/A

On-site Monitoring Results – Monitoring well sample results are from 755 PCi/L to 217,351 pCi/L for the most affected well.

Depth to Local Water Table – The depth is approximately eight to nine feet.

Classification of Subsurface Aquifers – Not used for drinking water.

Size and Extent of Any Groundwater Plume – Fifteen yards wide by fifty yards long.

Expected Movement/Mobility of Groundwater Plume – Westerly direction down-gradient toward Lake Michigan at approximately two feet per day.

Land Use Characteristics – Palisades site property, water not used for drinking or irrigation.

Remedial Actions Considered or Taken – None

Calculated Member of Public Dose Attributable to the Release – Total body and organ dose are both 3.93E-4 mrem.

Calculated Member of Public Dose Attributable to the Discharge – Total body and organ dose are both 3.93E-4 mrem.

Actions Taken to Prevent Recurrence – T-91 has been repaired and piping has been replaced.

NRC Notification, Date and contact Organization – The NRC was notified on December 10, 2007, by PNP.

2. Non-Routine Planned Discharges

During excavation to replace suspect piping, 5569 gallons of tritiated groundwater were pumped out and discharged to the mixing basin.

3. Radioactive Waste Treatment System Changes

None.

4. Annual Land Use Census Changes

There are no longer any beef cattle within five miles of the plant. Beef cattle were previously located in the southeast sector at 4.3 miles from the plant. The garden previously located in the southeast sector at 1.49 miles from the plant is no longer there. The garden critical receptor is now located in the northeast sector at 1.67 miles. The residence critical receptor is unchanged. Also unchanged is that there are no dairy cows or goats located within five miles of the plant.

5. Effluent Monitoring System Inoperability

No effluent monitor was out of service for more than 30 days.

6. Offsite Dose Calculation Manual (ODCM) Changes

The ODCM was revised on December 21, 2009, and issued on January 12, 2010. Table 1.3, "Palisades XOQDOQ," was updated to show the results of the XOQDOQ computer program run using 2009 land use census information and 2004 to 2008 meteorological data. Table 1.4, "Land Use Census," was updated to show the results of the 2009 land use census. Table 1.4a, "Critical Receptors," was updated to show the critical receptors and their revised XOQ and DOQ values. Enclosure 1 contains the ODCM, Revision 23, per the requirements of Technical Specification 5.5.1.c.3.

7. Process Control Program Changes

None.

8. Errata/Corrections to Previous Reports

None.

9. Other

Groundwater Monitoring

PNP installed five groundwater monitoring wells in 2007, and added an additional nine wells in 2008. These wells were strategically placed within the owner controlled area, both inside and outside the protected area to allow detection of radioactive contamination of ground water due to leaks or spills from plant systems. Monitoring well 3-07 is most indicative of the leak described above. Tritium levels ranged from a low of 755 pCi/L to a high of 217,351 pCi/L. Monitoring wells 2-07 and 11-08 had tritium level highs of 1493 and 2854 pCi/L, respectively, and both showed lows of less than the minimum detectable activity. The remaining wells showed no activity throughout the year. Well locations are depicted in Figure 1.

Sr-89, Sr-90 and Liquid Doses

In 2009, PNP used a new vendor to analyze effluent samples for hard-to-detect radionuclides. This vendor has the ability to detect a lower concentration for Sr-89 and Sr-90. These radionuclides were detected in service water and turbine sump samples at low level concentrations. The maximum value was 2.66E-8 µCi/ml. Consequently, due to the high yearly service water volume (1.05 E10 gallons), this resulted in high Sr-89 and Sr-90 release activities. This in turn, resulted in higher calculated liquid organ doses to the public. (In 2008, the organ dose was 2.13E-3 mrem. In 2009, the organ dose was 3.70E-1 mrem). It is strongly believed that the Sr-89 and Sr-90 values are due to background radioactivity. Currently, PNP does not have a technical paper documenting background radioactivity, so the calculated values will remain.

FIGURE 1
GROUNDWATER MONITORING WELL LOCATIONS

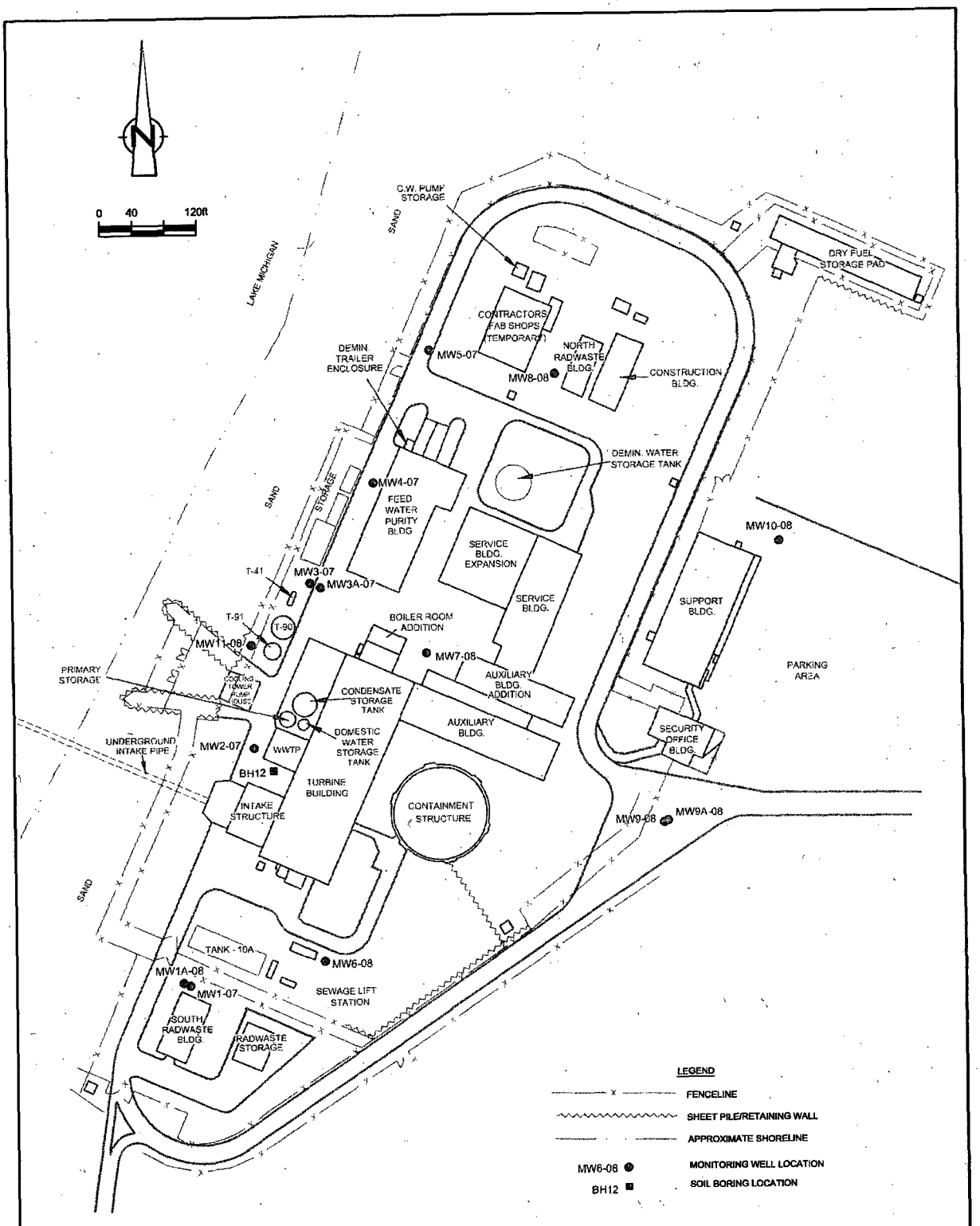

figure 4.1

GROUNDWATER MONITORING WELL LOCATIONS
PALISADES NUCLEAR POWER PLANT
27780 BLUE STAR HWY.
Covert, Michigan

050620-02(002)GN-DE003 NOV 17/2008

ATTACHMENT 1
Palisades - Table A-1
Gaseous Effluents – Sum of All Releases

Summation of All Releases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	Uncertainty
Fission and Activation Gases	Ci	2.922E+01	1.941E+00	1.146E+00	1.977E+00	3.428E+01	8.344%
Average Release Rate	µCi/s	3.757E+00	2.469E-01	1.442E-01	2.488E-01	1.087E+00	
% of Limit	%	1.978E-03	1.195E-04	7.259E-05	8.736E-04	7.559E-04	
Iodines (Halogens)	Ci	8.425E-04	3.555E-04	3.595E-04	2.296E-04	1.787E-03	1.965E+01%
Average Release Rate	µCi/s	1.083E-04	4.522E-05	4.523E-05	2.888E-05	5.667E-05	
% of Limit	%	3.199E-05	3.558E-05	2.063E-05	1.401E-05	2.549E-05	
Particulates	Ci	3.643E-07	2.226E-06	8.490E-08	1.795E-06	4.470E-06	30.96%
Average Release Rate	µCi/s	4.685E-08	2.831E-07	1.068E-08	2.259E-07	1.418E-07	
% of Limit	%	1.179E-06	1.041E-05	2.691E-08	6.936E-06	4.641E-06	
Tritium	Ci	2.013E+01	9.187E+00	5.881E+00	5.921E+00	4.112E+01	4.02%
Average Release Rate	µCi/s	2.588E+00	1.168E+00	7.399E-01	7.449E-01	1.304E+00	
% of Limit	%	6.290E-03	2.839E-03	1.798E-03	1.810E-03	3.168E-03	
Gross Alpha	Ci	1.885E-07	5.695E-07	2.630E-07	1.907E-07	1.212E-06	3.398E-15

ATTACHMENT 1
Palisades - Table A-1A
Gaseous Effluents – Ground Level Release, Batch Mode

Fission and Activation Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Ar-41	Ci	ND	ND	ND	ND	0.000E+00
Kr-85	Ci	1.890E-03	ND	ND	ND	1.890E-03
Kr-85m	Ci	5.830E-04	ND	ND	ND	5.830E-04
Kr-87	Ci	ND	ND	ND	ND	0.000E+00
Kr-88	Ci	ND	ND	ND	ND	0.000E+00
Xe-131m	Ci	3.636E-02	1.737E-02	ND	ND	5.373E-02
Xe-133	Ci	5.790E+00	1.053E+00	4.793E-03	4.057E-04	6.847E+00
Xe-133m	Ci	8.768E-02	4.420E-04	ND	ND	8.812E-02
Xe-135	Ci	3.916E-01	ND	ND	7.700E-06	3.916E-01
Xe-135m	Ci	ND	ND	ND	ND	0.000E+00
Xe-138	Ci	ND	ND	ND	ND	0.000E+00
(List Others)	Ci	ND	ND	ND	ND	0.000E+00
Total	Ci	6.308E+00	1.070E+00	4.793E-03	4.134E-04	7.383E+00

Iodines/Halogens	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
I-131	Ci	1.832E-06	3.342E-07	ND	ND	2.166E-06
I-132	Ci	1.020E-06	ND	ND	ND	1.020E-06
I-133	Ci	2.244E-06	ND	ND	ND	2.244E-06
I-134	Ci	ND	ND	ND	ND	0.000E+00
I-135	Ci	ND	ND	ND	ND	0.000E+00
Total	Ci	5.096E-06	3.342E-07	0.000E+00	0.000E+00	5.430E-06

Particulates	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Co-58	Ci	ND	ND	ND	ND	0.000E+00
Co-60	Ci	ND	ND	ND	ND	0.000E+00
Sr-89	Ci	NR	NR	NR	NR	0.000E+00
Sr-90	Ci	NR	NR	NR	NR	0.000E+00
Cs-134	Ci	ND	ND	ND	ND	0.000E+00
Cs-137	Ci	ND	ND	ND	ND	0.000E+00
Total	Ci	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Tritium	Ci	1.316E+01	NR	NR	NR	1.316E+01

Gross Alpha	Ci	NR	NR	NR	NR	0.000E+00

ND = Measurements performed but no activity detected.
NR = Analysis not required & not performed

ATTACHMENT 1
Palisades - Table A-1B
Gaseous Effluents – Ground Level Release, Continuous Mode

Fission and Activation Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Ar-41	Ci	ND	ND	ND	3.358E-02	3.358E-02
Kr-85	Ci	ND	ND	ND	ND	0.000E+00
Kr-85m	Ci	ND	ND	ND	1.812E-02	1.812E-02
Kr-87	Ci	ND	ND	7.500E-04	4.724E-02	4.799E-02
Kr-88	Ci	ND	ND	ND	5.014E-02	5.014E-02
Xe-131m	Ci	ND	ND	ND	ND	0.000E+00
Xe-133	Ci	2.290E+01	8.703E-01	1.138E+00	1.344E+00	2.626E+01
Xe-133m	Ci	ND	ND	ND	ND	0.000E+00
Xe-135	Ci	1.952E-03	6.920E-04	1.658E-03	2.072E-01	2.115E-01
Xe-135m	Ci	3.920E-03	ND	1.140E-03	9.600E-02	1.011E-01
Xe-138	Ci	ND	ND	ND	1.811E-01	1.811E-01
(List Others)	Ci	ND	ND	ND	ND	0.000E+00
Total	Ci	2.291E+01	8.710E-01	1.141E+00	1.977E+00	2.690E+01

Iodines/Halogens	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
I-131	Ci	1.402E-04	1.986E-04	7.881E-05	5.714E-05	4.747E-04
I-132	Ci	4.060E-04	ND	ND	ND	4.060E-04
I-133	Ci	2.912E-04	1.566E-04	2.807E-04	1.724E-04	9.009E-04
I-134	Ci	ND	ND	ND	ND	0.000E+00
I-135	Ci	ND	ND	ND	ND	0.000E+00
Total	Ci	8.374E-04	3.552E-04	3.595E-04	2.296E-04	1.782E-03

Particulates	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Co-58	Ci	1.190E-07	8.580E-08	3.270E-08	ND	2.375E-07
Co-60	Ci	2.240E-08	9.240E-08	3.910E-08	ND	1.539E-07
Sr-89	Ci	ND	3.976E-08	ND	4.475E-07	4.872E-07
Sr-90	Ci	2.229E-07	2.008E-06	ND	1.348E-06	3.579E-06
Cs-134	Ci	ND	ND	ND	ND	0.000E+00
Cs-137	Ci	ND	ND	1.310E-08	ND	1.310E-08
Total	Ci	3.643E-07	2.226E-06	8.490E-08	1.795E-06	4.470E-06

Tritium	Ci	6.967E+00	9.187E+00	5.881E+00	5.921E+00	2.796E+01

Gross Alpha	Ci	1.885E-07	5.695E-07	2.630E-07	1.907E-07	1.212E-06

ND = Measurements performed but no activity detected.

ATTACHMENT 1
Palisades - Table A-2
Liquid Effluents – Sum of All Releases

Summation of All Liquid Releases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	Uncertainty
Fission and Activation Products (excluding tritium, gases, and gross alpha)	Ci	2.084E-02	4.038E-02	9.096E-02	6.515E-02	2.173E-01	15.438%
Average Concentration	µCi/ml	6.290E-10	1.403E-09	2.268E-09	1.669E-09	1.541E-09	
% of Limit	%	3.142E-02	1.230E-01	3.655E-01	2.354E-01	2.015E-01	
Tritium	Ci	1.924E+02	4.561E+01	3.718E+01	2.219E+01	2.974E+02	4.02%
Average Concentration	µCi/ml	5.806E-06	1.585E-06	9.268E-07	5.685E-07	2.108E-06	
% of Limit	%	5.749E-01	1.569E-01	9.154E-02	5.614E-02	2.086E-01	
Dissolved and Entrained Gases	Ci	9.957E-03	1.760E+00	0.000E+00	0.000E+00	1.770E+00	27.99%
Average Concentration	µCi/ml	3.005E-10	6.116E-08	0.000E+00	0.000E+00	1.255E-08	
% Of Limit	%	1.502E-04	3.058E-02	0.000E+00	0.000E+00	6.274E-03	
Gross Alpha	Ci	4.453E-02	2.677E-02	1.631E-02	3.510E-02	1.227E-01	2.83E-08
Average Concentration	µCi/ml	1.344E-09	9.304E-10	4.066E-10	8.994E-10	8.699E-10	
Volume of Primary System Liquid Effluent (Before Dilution)	Liters	1.756E+06	6.959E+05	3.226E+05	1.390E+05	2.914E+06	
Dilution Water Used for Above	Liters	3.314E+10	2.878E+10	4.011E+10	3.902E+10	1.411E+11	
Volume of Secondary or Balance-of-Plant Liquid Effluent (e.g., low-activity or unprocessed) (Before Dilution)	Liters	8.058E+09	1.507E+10	8.621E+09	8.012E+09	3.976E+10	
Average Stream Flow	m^3/s	4.262E+00	3.660E+00	5.047E+00	4.910E+00	4.470E+00	

Dilution flow rate (gal/qtr) = # of Dilution pumps running x days running/qtr x 4000 gpm/pump x min/day

ATTACHMENT 1
Palisades - Table A-2A
Liquid Effluents – Batch Mode

Fission and Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Cr-51	Ci	ND	ND	ND	ND	0.000E+00
Mn-54	Ci	3.793E-04	ND	ND	ND	3.793E-04
Fe-55	Ci	0.000E+00	0.000E+00	0.000E+00	9.274E-06	9.274E-06
Fe-59	Ci	1.854E-04	ND	ND	ND	1.854E-04
Co-57	Ci	ND	ND	ND	ND	0.000E+00
Co-58	Ci	3.156E-03	2.369E-04	8.421E-05	1.207E-05	3.489E-03
Co-60	Ci	8.538E-03	2.230E-04	2.179E-04	5.649E-05	9.036E-03
Sr-89	Ci	1.941E-05	3.514E-06	4.501E-06	6.372E-07	2.806E-05
Sr-90	Ci	2.971E-06	2.758E-06	6.172E-07	4.412E-07	6.787E-06
Nb-95	Ci	2.280E-05	ND	ND	ND	2.280E-05
Ag-110m	Ci	4.589E-04	2.260E-05	ND	4.600E-06	4.861E-04
Sn-113	Ci	ND	ND	ND	ND	0.000E+00
Sb-124	Ci	ND	ND	ND	ND	0.000E+00
Sb-125	Ci	ND	ND	ND	ND	0.000E+00
I-131	Ci	2.670E-06	ND	ND	ND	2.670E-06
I-133	Ci	ND	ND	ND	ND	0.000E+00
I-135	Ci	ND	ND	ND	ND	0.000E+00
Cs-134	Ci	ND	ND	ND	ND	0.000E+00
Cs-137	Ci	ND	1.976E-05	2.683E-05	2.950E-06	4.954E-05
Ni-63	Ci	0.000E+00	0.000E+00	0.000E+00	6.518E-06	6.518E-06
Zn-65	Ci	1.320E-05	ND	ND	ND	1.320E-05
Zr-95	Ci	9.300E-06	ND	ND	ND	9.300E-06
La-140	Ci	1.414E-04	ND	ND	ND	1.414E-04
Totals	Ci	1.293E-02	5.085E-04	3.341E-04	9.298E-05	1.387E-02

Dissolved and Entrained Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Kr-85	Ci	ND	ND	ND	ND	0.000E+00
Kr-85m	Ci	ND	ND	ND	ND	0.000E+00
Kr-88	Ci	ND	ND	ND	ND	0.000E+00
Xe-131m	Ci	ND	ND	ND	ND	0.000E+00
Xe-133	Ci	9.957E-03	ND	ND	ND	9.957E-03
Xe-133m	Ci	ND	ND	ND	ND	0.000E+00
Xe-135	Ci	ND	ND	ND	ND	0.000E+00
Xe-135m	Ci	ND	ND	ND	ND	0.000E+00
Totals		9.957E-03	0.000E+00	0.000E+00	0.000E+00	9.957E-03
Tritium	Ci	1.905E+02	4.515E+01	3.672E+01	2.191E+01	2.943E+02
Gross Alpha	Ci	8.505E-05	3.135E-06	2.784E-06	9.725E-07	9.194E-05

ND = None Detected

ATTACHMENT 1
Palisades - Table A-2B
Liquid Effluents – Continuous Mode

Fission and Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Cr-51	Ci	ND	ND	ND	ND	0.000E+00
Mn-54	Ci	ND	ND	ND	ND	0.000E+00
Fe-55	Ci	ND	ND	ND	ND	0.000E+00
Fe-59	Ci	ND	ND	ND	ND	0.000E+00
Co-57	Ci	ND	ND	ND	ND	0.000E+00
Co-58	Ci	ND	ND	ND	ND	0.000E+00
Co-60	Ci	ND	ND	ND	ND	0.000E+00
Sr-89	Ci	4.558E-03	2.371E-02	1.853E-02	2.040E-02	6.720E-02
Sr-90	Ci	3.356E-03	1.616E-02	7.209E-02	4.465E-02	1.363E-01
Nb-95	Ci	ND	ND	ND	ND	0.000E+00
Ag-110m	Ci	ND	ND	ND	ND	0.000E+00
Sn-113	Ci	ND	ND	ND	ND	0.000E+00
Sb-124	Ci	ND	ND	ND	ND	0.000E+00
Sb-125	Ci	ND	ND	ND	ND	0.000E+00
I-131	Ci	ND	ND	ND	ND	0.000E+00
I-133	Ci	ND	ND	ND	ND	0.000E+00
I-135	Ci	ND	ND	ND	ND	0.000E+00
Cs-134	Ci	ND	ND	ND	ND	0.000E+00
Cs-137	Ci	ND	ND	ND	ND	0.000E+00
Ni-63	Ci	ND	ND	ND	ND	0.000E+00
Zn-65	Ci	ND	ND	ND	ND	0.000E+00
Zr-95	Ci	ND	ND	ND	ND	0.000E+00
La-140	Ci	ND	ND	ND	ND	0.000E+00
Totals	Ci	7.914E-03	3.987E-02	9.063E-02	6.505E-02	2.035E-01

Dissolved and Entrained Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Kr-85	Ci	ND	1.760E+00	ND	ND	1.760E+00
Kr-85m	Ci	ND	ND	ND	ND	0.000E+00
Kr-88	Ci	ND	ND	ND	ND	0.000E+00
Xe-131m	Ci	ND	ND	ND	ND	0.000E+00
Xe-133	Ci	ND	ND	ND	ND	0.000E+00
Xe-133m	Ci	ND	ND	ND	ND	0.000E+00
Xe-135	Ci	ND	ND	ND	ND	0.000E+00
Xe-135m	Ci	ND	ND	ND	ND	0.000E+00
Totals		0.000E+00	1.760E+00	0.000E+00	0.000E+00	1.760E+00

Tritium	Ci	1.912E+00	4.573E-01	4.586E-01	2.761E-01	3.104E+00

Gross Alpha	Ci	4.444E-02	2.677E-02	1.631E-02	3.510E-02	1.226E-01

ND = None Detected

ATTACHMENT 1
Palisades - Table A-3
Low Level Waste

Resins, Filters, and Evaporator Bottoms	Volume		Curies Shipped
Waste Class	ft^3	m^3	Curies
A	1.40E+02	3.96E+00	1.45E-05
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	1.40E+02	3.96E+00	1.45E-05

Major Nuclides for the Above Table:
H-3, Fe-55, Co-58, Co-60, Sr-90, Tc-99, Cs-134, Cs-137, Ce-144, Pu-241

Dry Active Waste	Volume		Curies Shipped
Waste Class	ft^3	m^3	Curies
A	3.29E+04	9.33E+02	5.98E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	3.29E+04	9.33E+02	5.98E+00

Major Nuclides for the Above Table:
H-3, Cr-51, Mn-54, Fe-55, Fe-59, Co-58, Co-60, Ni-63, Zr-95, Nb-95, Ag-110m, I-131

Irradiated Components	Volume		Curies Shipped
Waste Class	ft^3	m^3	Curies
A	0.00E+00	0.00E+00	0.00E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	0.00E+00	0.00E+00	0.00E+00

Other Waste	Volume		Curies Shipped
Waste Class	ft^3	m^3	Curies
A	1.86E+03	5.27E+01	8.72E-01
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	1.86E+03	5.27E+01	8.72E-01

Major Nuclides for the Above Table:
H-3, Mn-54, Co-58, Co-60, Ni-63, Cs-137

Sum of All Low-Level Waste Shipped from Site	Volume		Curies Shipped
Waste Class	ft^3	m^3	Curies
A	3.49E+04	9.90E+02	6.85E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	3.49E+04	9.90E+02	6.85E+00

Major Nuclides for the Above Table:
H-3, Cr-51, Mn-54, Fe-55, Fe-59, Co-58, Co-60, Ni-63, Zr-95, Nb-95, Ag-110m, I-131, Cs-137

ATTACHMENT 1
Palisades - Table A-4
Dose Assessments, 10 CFR Part 50, Appendix I

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Yearly
Liquid Effluent Dose Limit, Total Body	1.5 mrem	1.5 mrem	1.5 mrem	1.5 mrem	3 mrem
Total Body Dose	5.40E-03	1.97E-03	3.74E-03	2.76E-03	1.39E-02
% Of Limit	0.36%	0.13%	0.25%	0.18%	0.46%
Liquid Effluent Dose Limit, Any Organ	5 mrem	5 mrem	5 mrem	5 mrem	10 mrem
Organ Dose	2.05E-02	6.11E-02	1.73E-01	1.15E-01	3.70E-01
% of Limit	0.41%	1.22%	3.46%	2.30%	3.70%
Gaseous Effluent Dose Limit, Gamma Air	5 mrad	5 mrad	5 mrad	5 mrad	10 mrad
Gamma Air Dose	8.42E-04	5.26E-05	3.19E-05	3.27E-04	1.25E-03
% of Limit	0.02%	0.00%	0.00%	0.01%	0.01%
Gaseous Effluent Dose Limit, Beta Air	10 mrad	10 mrad	10 mrad	10 mrad	20 mrad
Beta Air Dose	2.41E-03	1.57E-04	9.33E-05	2.80E-04	2.94E-03
% of Limit	0.024%	0.002%	0.001%	0.003%	0.015%
Gaseous Effluent Dose Limit, Any Organ (Iodine, Tritium, Particulates with >8 day half-life)	7.5 mrem	7.5 mrem	7.5 mrem	7.5 mrem	15 mrem
Gaseous Effluent Organ Dose (Iodine, Tritium, Particulates with >8-Day half-life)	3.53E-03	2.46E-03	1.27E-03	1.14E-03	8.39E-03
% of Limit	0.05%	0.03%	0.02%	0.02%	0.06%

Palisades - Table A-5
EPA 40 CFR Part 190, Individual in the Unrestricted Area

	Whole Body	Thyroid	Any Other Organ
Dose Limit	25 mrem	75 mrem	25 mrem
Dose	1.39E-02	8.39E-03	3.70E-01
% of Limit	0.06%	0.01%	1.48%