

ENCLOSURE

**2011 ANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT**

PALO VERDE NUCLEAR GENERATING STATION
UNITS 1, 2 AND 3

2011

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

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INTRODUCTION

This report summarizes effluent and waste disposal source term data, meteorological data and doses from radioactive effluents for the Palo Verde Nuclear Generating Station (PVNGS) for the period of January through December 2011. The data presented meets the reporting requirements of Regulatory Guide 1.21 (Revision 1, June 1974) of the U.S. Nuclear Regulatory Commission and the PVNGS Technical Specifications.

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- NEI 07-07, Nuclear Energy Institute, Industry Ground Water Protection Initiative – Final Guidance Document, August 2007.
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APPENDIX A
SOURCE TERMS
AND
EFFLUENT AND WASTE DISPOSAL REPORTS

Supplemental Information

1.0 REGULATORY LIMITS

1.1 Liquid Releases

1.1.1 PVNGS ODCM Requirement 3.2

The concentration of radioactive material discharged from secondary system liquid waste to the circulating water system shall be limited to:

5.0E-07 $\mu\text{Ci/ml}$ for the principal gamma emitters (except Ce-144)

3.0E-06 $\mu\text{Ci/ml}$ for Ce-144

1.0E-06 $\mu\text{Ci/ml}$ for I-131.

1.0E-03 $\mu\text{Ci/ml}$ for H-3

The concentration of radioactive material discharged from secondary system liquid waste to the onsite evaporation ponds shall be limited to:

2.0E-06 $\mu\text{Ci/ml}$ for Cs-134

2.0E-06 $\mu\text{Ci/ml}$ for Cs-137

The concentrations specified in 10 CFR Part 20.1001-20.2402, Appendix B, Table 2, Column 2, for all other isotopes

1.1.2 PVNGS ODCM Requirement 4.4

The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each reactor unit, to areas at and beyond the SITE BOUNDARY shall be limited:

- a. During any calendar quarter to less than or equal to 1.5 mrems to the total body and to less than or equal to 5 mrems to any organ, and
- b. During any calendar year to less than or equal to 3 mrems to the total body and to less than or equal to 10 mrems to any organ.

1.2 Gaseous Releases

1.2.1 PVNGS ODCM Requirement 3.1

The dose rate due to radioactive materials released in gaseous effluents from the site shall be limited to the following:

- a. For noble gases: Less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin, and
- b. For I-131 and I-133, for tritium, and for all radionuclides in particulate form with half-lives greater than 8 days: Less than or equal to 1500 mrem/yr to any organ.

1.2.2 PVNGS ODCM Requirement 4.1

The air dose due to noble gases released in gaseous effluents, from each reactor unit, to areas at and beyond the SITE BOUNDARY shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation and,
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

1.2.3 PVNGS ODCM Requirement 4.2

The dose to a MEMBER OF THE PUBLIC from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released, from each reactor unit, to areas at and beyond the SITE BOUNDARY shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ and,
- b. During any calendar year: Less than or equal to 15 mrem to any organ.

1.2.4 PVNGS ODCM Requirement 4.3

The GASEOUS RADWASTE SYSTEM and the VENTILATION EXHAUST TREATMENT SYSTEM shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected gaseous effluent air doses due to gaseous effluent releases, from each reactor unit, from the site, when averaged over 31 days, would exceed 0.2 mrad for gamma radiation and 0.4 mrad for beta radiation. The VENTILATION EXHAUST TREATMENT SYSTEM shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected doses due to gaseous effluent releases, from each reactor unit, to areas at and beyond the SITE BOUNDARY when averaged over 31 days, would exceed 0.3 mrem to any organ of a MEMBER OF THE PUBLIC.

1.3 Total Dose

1.3.1 PVNGS ODCM Requirement 5.1

The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to direct radiation from uranium fuel cycle sources shall be limited to less than or equal to 25 mrems to the total body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems.

2.0 MAXIMUM PERMISSIBLE CONCENTRATIONS

Air: Release Concentrations are limited to dose rate limits described in section 1.2.1 of this report.

3.0 AVERAGE ENERGY

The average energy (\bar{E}) of the radionuclide mixture in releases of fission and activation gases is not applicable to PVNGS.

4.0 MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY IN GASEOUS EFFLUENTS

For continuous releases, sampling is in accordance with PVNGS ODCM Table 3-1. Particulate and iodine radionuclides are sampled continuously at the Plant Vent and Fuel Building exhaust points. The particulate filters and charcoal cartridges are exchanged for analysis at least four times per month. Noble gas and tritium are sampled at least once per 31 days. The hourly average Radiation Monitoring System (RMS) effluent monitor readings are used, when available, to account for increases and decreases in noble gas concentrations between noble gas grab samples. The tritium concentration is assumed constant between sampling periods.

For batch releases, sampling is also in accordance with PVNGS ODCM Table 3-1. For containment purges, the noble gas concentration may be adjusted to account for decreases or increases in concentration during the purge using RMS readings. The volume of air released during the purge is determined using the exhaust fan rated flow rate. For Waste Gas Decay Tank releases, the volume released is corrected to standard pressure.

Effective January 1, 2004, Containment Purge release permits are updated by removing the permit pre-release particulate and iodine activity. This eliminates double accounting for the Containment Purge particulate and iodine activity at the Plant Vent but allows the particulate and iodine activity to be included in the Containment Purge pre-release dose projection.

The Lower Limit of Detection (LLD) of a measurement system is defined in Table 3 - 1 of the PVNGS ODCM. An average LLD for each radionuclide is provided in Table 3.

5.0 BATCH RELEASES

5.1 Gaseous.

Batch release durations are presented in Table 2.

5.2 Liquid

None.

6.0 ABNORMAL RELEASES

None.

7.0 OFFSITE DOSE CALCULATION MANUAL AND PROCESS CONTROL PROGRAM (PCP) REVISIONS

7.1 ODCM, Revision 26, effective September 30, 2011, contains changes associated with the implementation of the Radioactive Environmental Monitoring Program (REMP). The ODCM revision is included as Appendix E.

7.2 There were no revisions to the Process Control Program (PCP) in 2011.

8.0 EFFLUENTS AND SOLID WASTES

8.1 Gaseous Effluents

Gaseous effluent information is presented in Table 1 through Table 41. Included in these tables are summaries of the effluents and estimated total error.

8.2 Liquid Effluents

There were no liquid effluent releases beyond the Site Boundary from PVNGS.

8.3 Solid Waste

Solid waste shipments are summarized in Table 42.

9.0 MISCELLANEOUS INFORMATION

9.1 EVAPORATION PONDS

Releases made to the Evaporation Ponds are limited to the concentrations specified in PVNGS ODCM Requirement 3.2. The Evaporation Ponds were monitored in accordance with PVNGS ODCM Requirement 6.1.

The average historical evaporation is approximately 12 inches, per pond, for each of the first and fourth quarters, and 33 inches, per pond, for each of the second and third quarters.

Evaporation Pond One is approximately 250 acres.

Evaporation Pond Two was relined and segmented into 3 sections. 2A is approximately 113 acres, 2B is approximately 82 acres and 2C is approximately 28 acres.

Evaporation Pond Three is constructed of two smaller ponds of 90 acres each (3A and 3B).

The amount of water evaporated from each section of each Evaporaton Pond is listed in Table 1.

Evaporation Pond 1 was empty for maintenance in quarters three and four. Evaporation Pond 2 was empty for maintenance in quarters one and two.

Using a site boundary X/Q of $5.0E-05 \text{ sec/m}^3$ for the evaporation ponds and equation 4-3 from the ODCM, the dose from the evaporation ponds to a hypothetical individual at the site boundary, for all pathways, is summarized in Table 1.

9.2 RADIATION MONITORING SYSTEM SETPOINT VERIFICATION

Current effluent monitor noble gas channel alert alarm setpoints are based on an assumed one per cent failed fuel source term. The current setpoints are more conservative than setpoints calculated using the actual noble gas source term presented in Table 38.

9.3 RCS RADIOIODINE (TRM T5.0.600)

There were no cases where primary coolant specific activity exceeded the Technical Specification 3.4.17 limits during the reporting period.

9.4 INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

There are no radioactive effluents from the NAC-UMS System. Direct dose at the Site Boundary is reported in the Annual Radiological Environmental Operating Report.

9.5 MAJOR CHANGES TO THE RADIOACTIVE WASTE SYSTEMS (liquid, gaseous, and solid).

Licensee-initiated major changes to the radioactive waste systems (liquid, gaseous, and solid) are submitted as part of the FSAR update (TRM T5.0.500.4.a).

9.6 SAMPLES RESULTS FROM GROUNDWATER WELLS THAT ARE NOT DESCRIBED IN THE ODCM AS PART OF THE REMP (NEI 07-07, Industry Groundwater Protection Initiative, August 2007); are included in Appendix D. This initiative provides added assurance that ground water will not be adversely affected by PVNGS operations.

There were no NEI 07-07, reportable leaks or spills.

There were no positive sample results.

9.7 REPORT ADDENDUM

None.

10.0 DISCUSSION

10.1 Unit One

Unit One operated with a refueling outage (1R16) from October 8, 2011 to November 28, 2011.

Maintenance outages:
1M16A, August 6, 2011 to August 11, 2011

Estimated number of fuel defects (source: INPO, CDE)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	0	0	0	0	0	0	0	0

10.2 Unit Two

Unit Two operated with a refueling outage (2R16) from April 2, 2011 to May 6, 2011.

Maintenance outages:
NONE.

Estimated number of fuel defects (source: INPO, CDE)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	0	0	0	0	0	0	0	0

10.3 Unit Three

Unit Three operated without a refueling outage.

Maintenance outages:
3M16A, January 19, 2011 to January 22, 2011
3M16B, August 21, 2011 to August 22, 2011

Estimated number of fuel defects (source: INPO, CDE)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	0	0	0	0	0	0	0	0

10.4 Carbon-14

Carbon-14 is formed naturally in the upper atmosphere and also is formed in operating nuclear reactors.

Carbon-14 is not a new power plant emission. Because the overall quantity of radioactive releases has steadily decreased due to improvements in power plant operations, carbon-14 may now qualify as a "principal radionuclide" under revised federal regulatory guidance. The levels of other releases have declined, so carbon-14 releases, expressed as a percentage of total releases, have the potential to achieve "principal radionuclide" status (anything greater than one percent of overall radioactivity in effluents) per updated federal regulatory guidance.

The radiation dose to the public from carbon-14 is much lower than regulatory limits and has been a very small contributor to the total radiation dose that Americans receive each year from natural and manmade sources.

Studies by the United Nations Scientific Committee on the Effects of Atomic Radiation, the National Research Council's BEIR VII study group and the National Council on Radiation Protection and Measurements all show that the risk associated with low-dose radiation from natural and man-made sources, including nuclear power plants, is negligible.

Radiation is measured in units called millirem. The average American is exposed to 620 millirem of radiation every year. Approximately 311 millirem of this comes from natural sources. The majority of the remaining dose (approximately 300 millirem) comes from medical procedures such as CAT scans. Less than one-tenth of a percent of all radiation exposure is from nuclear facilities. Reference: NCRP Report No. 160, Table 1.1.

Starting with the 2010 Annual Radioactive Effluent Release Report, PVNGS will include the estimated exposure from carbon-14 in the Appendix C, dose calculations. The PVNGS calculated production of carbon-14 is 18.5 Curies per cycle (500 days) or 13.5 curies per year. Based on published literature, twenty percent (20%) of the carbon-14 released is assumed to be in an inorganic form (CO₂). PVNGS will use an estimated value of 2.7 curies of carbon-14 released, per reactor, per year. The 2.7 curies will be divided equally between each quarter (0.68 curies per reactor, per quarter). Appendix C, dose calculations include this estimated carbon-14 dose. Appendix C also includes the dose excluding carbon-14 for comparison with historical reports.

10.5 Tritium

PVNGS does not have a liquid release pathway. Removal of tritium is performed by operation of the Boric Acid Concentrator (BAC) in the release mode. Comparison of PVNGS annual tritium curies released to other utilities should be made only after summing both liquid and gaseous tritium curies released.

10.6 Fukushima Japan

During 2011, Quarter 1, effluent samples identified detectable concentrations of isotopes that could be related to operation of PVNGS. The concentrations detected were above levels historically observed for the plant's status during that period. Concentrations returned to those historically observed levels after Quarter 1.

Given the events of March 2011 at the Fukushima Dai-ichi plant and the associated airborne releases and subsequent trans-Pacific transportation, the slightly elevated concentrations detected at PVNGS are reasonably attributed to the Dai-ichi releases. However, the concentrations detected at PVNGS and projected doses are conservatively included in this report for completeness.

10.7 Dose Summary

Dose for 2011 was primarily due to the release of tritium. Tritium production is approximately 1000 curies per Reactor Unit per year. In order to control plant tritium concentrations, tritium releases should match tritium production. For 2011, PVNGS released a total of 2020 curies of tritium (see Table 39).

Total dose due to releases from all three Units for 2011 were lower than 2010, primarily due to lower releases of tritium.

Table 1: Evaporation Pond Data					
Evaporation Pond 1	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	3.08E+11	8.48E+11	8.48E+11	3.08E+11	
Tritium Concentration (uCi/cc)	9.56E-07	9.36E-07	N/A	N/A	
Tritium Curies	2.94E-01	7.94E-01	0.00E+00	0.00E+00	1.09E+00
Evaporation Pond 2A	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	1.39E+11	3.83E+11	3.83E+11	1.39E+11	
2A Tritium Concentration (uCi/cc)	N/A	N/A	3.34E-07	3.17E-07	
2A Tritium curies	0.00E+00	0.00E+00	1.28E-01	4.41E-02	1.72E-01
Evaporation Pond 2B	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	1.01E+11	2.77E+11	2.77E+11	1.01E+11	
2B Tritium Concentration (uCi/cc)	N/A	N/A	N/A	N/A	
2B Tritium curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Evaporation Pond 2C	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	3.46E+10	9.52E+10	9.52E+10	3.46E+10	
2C Tritium Concentration (uCi/cc)	N/A	N/A	N/A	N/A	
2C Tritium curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Evaporation Pond 3A	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	1.11E+11	3.05E+11	3.05E+11	1.11E+11	
3A Tritium Concentration (uCi/cc)	6.13E-07	6.07E-07	5.00E-07	< LLD	
3A Tritium curies	6.80E-02	1.85E-01	1.53E-01	< LLD	4.06E-01
Evaporation Pond 3B	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	1.11E+11	3.05E+11	3.05E+11	1.11E+11	
3B Tritium Concentration (uCi/cc)	8.12E-07	5.61E-07	6.04E-07	< LLD	
3B Tritium curies	9.01E-02	1.71E-01	1.84E-01	< LLD	4.45E-01
Dose (mRem)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Pond 1	4.08E-03	1.10E-02	0.00E+00	0.00E+00	1.51E-02
Pond 2	0.00E+00	0.00E+00	1.77E-03	6.12E-04	2.38E-03
Pond 3	2.19E-03	4.94E-03	4.67E-03	0.00E+00	1.18E-02
Total	6.28E-03	1.59E-02	6.44E-03	6.12E-04	2.93E-02

Table 2: Batch Release Data			
All times are in hours	Unit 1	Unit 2	Unit 3
January - June			
Number of batch releases	30	40	25
Total time period for batch releases	446.60	1374.15	217.09
Maximum time period for a batch release	128.00	168.00	112.85
Average time period for a batch release	14.89	34.35	8.68
Minimum time period for a batch release	0.27	0.05	0.05
July - December			
Number of batch releases	45	24	26
Total time period for batch releases	2448.56	56.33	508.13
Maximum time period for a batch release	168.00	15.87	150.20
Average time period for a batch release	54.41	2.35	19.54
Minimum time period for a batch release	0.17	0.57	0.12
January - December			
Number of batch releases	75	64	51
Total time period for batch releases	2895.16	1430.48	725.22
Maximum time period for a batch release	168.00	168.00	150.20
Average time period for a batch release	38.60	22.35	14.22
Minimum time period for a batch release	0.17	0.05	0.05

**Table 3:
Units 1, 2 & 3
Gaseous Effluents Average Lower Limit Of Detection**

μCi/cc					
Nuclide	Continuous	Batch	Nuclide	Continuous	Batch
Antimony-122	2.20E-13	1.90E-11	Argon-41	4.50E-08	4.50E-08
Antimony-124	8.40E-14	1.70E-11	Krypton-85	7.40E-06	7.40E-06
Barium-140	3.40E-13	5.70E-11	Krypton-85m	2.20E-08	2.20E-08
Bromine-82	3.30E-13	1.40E-11	Krypton-87	5.70E-08	5.70E-08
Cerium-141	8.70E-14	3.10E-11	Krypton-88	7.40E-08	7.40E-08
Cerium-144	3.60E-13	6.50E-11	Xenon-125	2.20E-08	2.20E-08
Cesium-134	1.00E-13	2.60E-11	Xenon-127	2.10E-08	2.10E-08
Cesium-137	8.10E-14	1.70E-11	Xenon-131m	9.10E-07	9.10E-07
Cesium-138	5.20E-10	7.30E-10	Xenon-133	6.30E-08	6.30E-08
Chromium-51	6.90E-13	1.40E-10	Xenon-133m	1.90E-07	1.90E-07
Cobalt-58	8.50E-14	1.70E-11	Xenon-135	2.00E-08	2.00E-08
Cobalt-60	1.00E-13	1.90E-11	Xenon-135m	8.90E-08	8.90E-08
Iron-59	1.70E-13	3.20E-11	Xenon-138	2.00E-07	2.00E-07
Lanthanum-140	2.80E-13	2.10E-11	Iodine-131	8.00E-14	7.00E-12
Manganese-54	8.30E-14	1.70E-11	Iodine-132	6.60E-12	1.90E-11
Molybdenum-99	2.40E-13	2.80E-11	Iodine-133	4.70E-13	1.10E-11
Niobium-95	8.70E-14	1.80E-11	Iodine-134	5.90E-11	8.20E-11
Rubidium-88	1.90E-08	1.90E-08	Iodine-135	7.00E-12	5.50E-11
Ruthenium-103	7.40E-14	1.50E-11			
Strontium-89	2.15E-15	(1)			
Strontium-90	5.60E-16	(1)			
Tellurium-123m	6.60E-14	1.50E-11			
Tritium	3.80E-07	3.80E-07			
Zinc-65	1.90E-13	3.80E-11			
Zirconium-95	1.80E-13	4.10E-11			
Gross Alpha	3.60E-15	(1)			
(1) Not required for batch releases.					

Table 4: Unit 1 Gaseous Effluents - Summation Of All Releases							
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total For Year	Est. Total Error % (1)
A. Fission & activation gases							
1. Total release	Ci	1.21E-01	1.38E-01	3.33E-01	5.32E-01	1.12E+00	3.54E+01
2. Average release rate for period	μCi/sec	1.56E-02	1.76E-02	4.19E-02	6.69E-02	3.55E-02	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
B. Iodine 131							
1. Total Iodine 131	Ci	4.45E-05	< LLD	1.09E-06	4.57E-05	9.13E-05	3.32E+01
2. Average release rate for period	μCi/sec	5.72E-06	< LLD	1.37E-07	5.75E-06	2.90E-06	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
C. Particulates							
1. Particulates with half- lives > 8 days	Ci	2.04E-06	< LLD	< LLD	2.32E-04	2.34E-04	3.43E+01
2. Average release rate for period	μCi/sec	2.62E-07	< LLD	< LLD	2.92E-05	7.42E-06	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
4. Gross Alpha radioactivity	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	
D. Tritium							
1. Total release	Ci	1.06E+02	1.84E+02	5.48E+02	1.32E+02	9.70E+02	3.85E+01
2. Average release rate for period	μCi/sec	1.36E+01	2.34E+01	6.89E+01	1.66E+01	3.08E+01	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
(1) Estimated total error methodology is presented in Table 40.							
(2) See Table 11 for percent of ODCM Requirement limits.							

Table 5: Unit 1 Gaseous Effluents - Ground Level Releases - Continuous - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	< LLD	1.45E-01	1.45E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	1.45E-01	1.45E-01
2. Iodines						
I-131	Ci	4.45E-05	< LLD	1.09E-06	4.57E-05	9.13E-05
I-132	Ci	4.63E-05	< LLD	< LLD	< LLD	4.63E-05
I-133	Ci	< LLD	< LLD	< LLD	9.48E-06	9.48E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	9.08E-05	< LLD	1.09E-06	5.52E-05	1.47E-04

Table 6: Unit 1 Gaseous Effluents - Ground Level Releases - Continuous - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	< LLD	< LLD	5.41E-05	5.41E-05
Co-60	Ci	< LLD	< LLD	< LLD	4.34E-06	4.34E-06
Cr-51	Ci	< LLD	< LLD	< LLD	4.50E-05	4.50E-05
Cs-134	Ci	1.02E-06	< LLD	< LLD	< LLD	1.02E-06
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	9.48E-07	< LLD	< LLD	< LLD	9.48E-07
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	8.60E-07	8.60E-07
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	3.69E-06	3.69E-06
Os-191	Ci	< LLD	< LLD	< LLD	4.52E-06	4.52E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	2.11E-07	2.11E-07
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	4.91E-08	< LLD	< LLD	< LLD	4.91E-08
Sr-90	Ci	2.19E-08	< LLD	< LLD	< LLD	2.19E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	4.41E-06	4.41E-06
Total	Ci	2.04E-06	< LLD	< LLD	1.17E-04	1.19E-04
4. Tritium						
H-3	Ci	1.59E+01	1.29E+01	1.90E+01	1.79E+01	6.57E+01

Table 7: Unit 1 Gaseous Effluents - Ground Level Releases - Batch - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	8.61E-02	9.73E-02	1.41E-01	4.85E-02	3.73E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	4.53E-03	4.53E-03
Xe-133	Ci	3.36E-02	3.95E-02	1.84E-01	3.31E-01	5.88E-01
Xe-133m	Ci	< LLD	< LLD	< LLD	1.17E-03	1.17E-03
Xe-135	Ci	9.12E-04	8.76E-04	6.74E-03	1.48E-03	1.00E-02
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.21E-01	1.38E-01	3.33E-01	3.86E-01	9.77E-01
2. Iodines						
I-131	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-132	Ci	< LLD	< LLD	< LLD	5.89E-06	5.89E-06
I-133	Ci	< LLD	9.06E-08	5.30E-07	< LLD	6.21E-07
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	9.06E-08	5.30E-07	5.89E-06	6.51E-06

**Table 8:
Unit 1
Gaseous Effluents - Ground Level Releases - Batch - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	4.76E-07	4.76E-07
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	< LLD	< LLD	1.37E-05	1.37E-05
Co-60	Ci	< LLD	< LLD	< LLD	4.96E-06	4.96E-06
Cr-51	Ci	< LLD	< LLD	< LLD	1.14E-05	1.14E-05
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	7.61E-05	7.61E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	5.11E-06	5.11E-06
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	3.43E-06	3.43E-06
Total	Ci	< LLD	< LLD	< LLD	1.15E-04	1.15E-04
4. Tritium						
H-3	Ci	9.01E+01	1.71E+02	5.29E+02	1.14E+02	9.04E+02
Note 1 - Not required for batch releases						

Table 9: Unit 1 Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	8.61E-02	9.73E-02	1.41E-01	4.85E-02	3.73E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	4.53E-03	4.53E-03
Xe-133	Ci	3.36E-02	3.95E-02	1.84E-01	3.31E-01	5.88E-01
Xe-133m	Ci	< LLD	< LLD	< LLD	1.17E-03	1.17E-03
Xe-135	Ci	9.12E-04	8.76E-04	6.74E-03	1.47E-01	1.55E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.21E-01	1.38E-01	3.33E-01	5.32E-01	1.12E+00
2. Iodines						
I-131	Ci	4.45E-05	< LLD	1.09E-06	4.57E-05	9.13E-05
I-132	Ci	4.63E-05	< LLD	< LLD	5.89E-06	5.22E-05
I-133	Ci	< LLD	9.06E-08	5.30E-07	9.48E-06	1.01E-05
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	9.08E-05	9.06E-08	1.62E-06	6.11E-05	1.54E-04

**Table 10:
Unit 1
Gaseous Effluents - Continuous and Batch - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	4.76E-07	4.76E-07
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	< LLD	< LLD	6.78E-05	6.78E-05
Co-60	Ci	< LLD	< LLD	< LLD	9.30E-06	9.30E-06
Cr-51	Ci	< LLD	< LLD	< LLD	5.64E-05	5.64E-05
Cs-134	Ci	1.02E-06	< LLD	< LLD	< LLD	1.02E-06
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	9.48E-07	< LLD	< LLD	< LLD	9.48E-07
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	7.70E-05	7.70E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	8.80E-06	8.80E-06
Os-191	Ci	< LLD	< LLD	< LLD	4.52E-06	4.52E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	2.11E-07	2.11E-07
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	4.91E-08	< LLD	< LLD	< LLD	4.91E-08
Sr-90	Ci	2.19E-08	< LLD	< LLD	< LLD	2.19E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	7.84E-06	7.84E-06
Total	Ci	2.04E-06	< LLD	< LLD	2.32E-04	2.34E-04
Total > 8 days	Ci	2.04E-06	< LLD	< LLD	2.32E-04	2.34E-04
4. Tritium						
H-3	Ci	1.06E+02	1.84E+02	5.48E+02	1.32E+02	9.70E+02

Table 11: Unit 1 Radiation Doses At And Beyond The Site Boundary						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	2.30E-04	2.60E-04	3.93E-04	2.40E-04	1.12E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	4.60E-03	5.20E-03	7.86E-03	4.80E-03	1.12E-02
Beta Air Dose	mrad	9.04E-05	1.02E-04	1.90E-04	2.47E-04	6.30E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	9.04E-04	1.02E-03	1.90E-03	2.47E-03	3.15E-03
Maximum Organ Dose (excluding skin)	mrem	3.86E-02	6.60E-02	1.97E-01	4.78E-02	3.49E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Thyroid	Thyroid	Thyroid	Thyroid	Thyroid
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	5.15E-01	8.80E-01	2.63E+00	6.37E-01	2.33E+00

Calculations are based on parameters and methodologies of the ODCM using historical meteorology. Dose is calculated to a hypothetical individual. In contrast, Appendix C dose calculations are based on concurrent meteorology, a real individual, and only the actual pathways present.

Table 12: Unit 2 Gaseous Effluents - Summation Of All Releases							
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total For Year	Est. Total Error % (1)
A. Fission & activation gases							
1. Total release	Ci	4.78E-01	3.07E+00	1.00E-01	1.96E-01	3.85E+00	3.54E+01
2. Average release rate for period	μCi/sec	6.15E-02	3.90E-01	1.26E-02	2.47E-02	1.22E-01	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
B. Iodine 131							
1. Total Iodine 131	Ci	4.89E-05	6.24E-05	< LLD	< LLD	1.11E-04	3.32E+01
2. Average release rate for period	μCi/sec	6.29E-06	7.94E-06	< LLD	< LLD	3.52E-06	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
C. Particulates							
1. Particulates with half- lives > 8 days	Ci	3.76E-05	9.11E-04	2.33E-06	< LLD	9.51E-04	3.43E+01
2. Average release rate for period	μCi/sec	4.83E-06	1.16E-04	2.94E-07	< LLD	3.02E-05	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
4. Gross Alpha radioactivity	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	
D. Tritium							
1. Total release	Ci	4.40E+02	1.48E+02	2.31E+01	2.91E+01	6.40E+02	3.85E+01
2. Average release rate for period	μCi/sec	5.66E+01	1.88E+01	2.91E+00	3.66E+00	2.03E+01	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
(1) Estimated total error methodology is presented in Table 40.							
(2) See Table 19 for percent of ODCM Requirement limits.							

Table 13: Unit 2 Gaseous Effluents - Ground Level Releases - Continuous - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	< LLD	1.16E+00	< LLD	< LLD	1.16E+00
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	1.16E+00	< LLD	< LLD	1.16E+00
2. Iodines						
I-131	Ci	4.89E-05	6.03E-05	< LLD	< LLD	1.09E-04
I-132	Ci	< LLD	7.39E-04	< LLD	< LLD	7.39E-04
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	4.89E-05	7.99E-04	< LLD	< LLD	8.48E-04

**Table 14:
Unit 2
Gaseous Effluents - Ground Level Releases - Continuous - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	1.34E-05	5.94E-05	1.89E-06	< LLD	7.46E-05
Co-60	Ci	< LLD	9.83E-05	4.43E-07	< LLD	9.87E-05
Cr-51	Ci	2.09E-05	9.45E-05	< LLD	< LLD	1.15E-04
Cs-134	Ci	1.01E-06	< LLD	< LLD	< LLD	1.01E-06
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	6.55E-07	< LLD	< LLD	< LLD	6.55E-07
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	1.57E-06	5.53E-06	< LLD	< LLD	7.11E-06
Os-191	Ci	< LLD	4.36E-06	< LLD	< LLD	4.36E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	6.13E-08	< LLD	< LLD	< LLD	6.13E-08
Sr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	2.59E-06	< LLD	< LLD	2.59E-06
Total	Ci	3.76E-05	2.65E-04	2.33E-06	< LLD	3.05E-04
4. Tritium						
H-3	Ci	1.37E+01	2.49E+01	2.15E+01	2.90E+01	8.90E+01

Table 15: Unit 2 Gaseous Effluents - Ground Level Releases - Batch - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	4.12E-01	4.40E-01	8.37E-02	1.57E-01	1.09E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	1.77E-01	< LLD	< LLD	1.77E-01
Kr-85m	Ci	2.18E-07	< LLD	< LLD	< LLD	2.18E-07
Kr-87	Ci	1.26E-07	< LLD	< LLD	< LLD	1.26E-07
Kr-88	Ci	3.01E-07	< LLD	< LLD	1.72E-04	1.73E-04
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	6.35E-02	1.25E+00	1.67E-02	3.86E-02	1.37E+00
Xe-133m	Ci	7.39E-07	< LLD	< LLD	< LLD	7.39E-07
Xe-135	Ci	2.13E-03	4.67E-02	< LLD	1.21E-04	4.90E-02
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	4.78E-01	1.91E+00	1.00E-01	1.96E-01	2.69E+00
2. Iodines						
I-131	Ci	< LLD	2.06E-06	< LLD	< LLD	2.06E-06
I-132	Ci	< LLD	4.31E-05	< LLD	< LLD	4.31E-05
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	4.52E-05	< LLD	< LLD	4.52E-05

**Table 16:
Unit 2
Gaseous Effluents - Ground Level Releases - Batch - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	4.03E-05	< LLD	< LLD	4.03E-05
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	2.62E-07	< LLD	< LLD	2.62E-07
Co-58	Ci	< LLD	2.12E-04	< LLD	< LLD	2.12E-04
Co-60	Ci	< LLD	3.31E-05	< LLD	< LLD	3.31E-05
Cr-51	Ci	< LLD	3.04E-04	< LLD	< LLD	3.04E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	7.31E-08	< LLD	< LLD	7.31E-08
Cs-138	Ci	2.99E-07	< LLD	< LLD	< LLD	2.99E-07
Fe-59	Ci	< LLD	4.36E-06	< LLD	< LLD	4.36E-06
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	9.13E-06	< LLD	< LLD	9.13E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	4.83E-05	< LLD	< LLD	4.83E-05
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	3.36E-07	< LLD	< LLD	< LLD	3.36E-07
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	3.51E-05	< LLD	< LLD	3.51E-05
Total	Ci	6.36E-07	6.87E-04	< LLD	< LLD	6.87E-04
4. Tritium						
H-3	Ci	4.26E+02	1.23E+02	1.55E+00	1.53E-01	5.51E+02
Note 1 - Not required for batch releases						

**Table 17:
Unit 2
Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	4.12E-01	4.40E-01	8.37E-02	1.57E-01	1.09E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	1.77E-01	< LLD	< LLD	1.77E-01
Kr-85m	Ci	2.18E-07	< LLD	< LLD	< LLD	2.18E-07
Kr-87	Ci	1.26E-07	< LLD	< LLD	< LLD	1.26E-07
Kr-88	Ci	3.01E-07	< LLD	< LLD	1.72E-04	1.73E-04
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	6.35E-02	2.41E+00	1.67E-02	3.86E-02	2.53E+00
Xe-133m	Ci	7.39E-07	< LLD	< LLD	< LLD	7.39E-07
Xe-135	Ci	2.13E-03	4.67E-02	< LLD	1.21E-04	4.90E-02
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	4.78E-01	3.07E+00	1.00E-01	1.96E-01	3.85E+00
2. Iodines						
I-131	Ci	4.89E-05	6.24E-05	< LLD	< LLD	1.11E-04
I-132	Ci	< LLD	7.82E-04	< LLD	< LLD	7.82E-04
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	4.89E-05	8.44E-04	< LLD	< LLD	8.93E-04

Table 18: Unit 2 Gaseous Effluents - Continuous and Batch - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	4.03E-05	< LLD	< LLD	4.03E-05
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	2.62E-07	< LLD	< LLD	2.62E-07
Co-58	Ci	1.34E-05	2.71E-04	1.89E-06	< LLD	2.86E-04
Co-60	Ci	< LLD	1.31E-04	4.43E-07	< LLD	1.32E-04
Cr-51	Ci	2.09E-05	3.99E-04	< LLD	< LLD	4.20E-04
Cs-134	Ci	1.01E-06	< LLD	< LLD	< LLD	1.01E-06
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	6.55E-07	7.31E-08	< LLD	< LLD	7.28E-07
Cs-138	Ci	2.99E-07	< LLD	< LLD	< LLD	2.99E-07
Fe-59	Ci	< LLD	4.36E-06	< LLD	< LLD	4.36E-06
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	9.13E-06	< LLD	< LLD	9.13E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	1.57E-06	5.38E-05	< LLD	< LLD	5.54E-05
Os-191	Ci	< LLD	4.36E-06	< LLD	< LLD	4.36E-06
Rb-88	Ci	3.36E-07	< LLD	< LLD	< LLD	3.36E-07
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	6.13E-08	< LLD	< LLD	< LLD	6.13E-08
Sr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	3.77E-05	< LLD	< LLD	3.77E-05
Total	Ci	3.82E-05	9.51E-04	2.33E-06	< LLD	9.92E-04
Total > 8 days	Ci	3.76E-05	9.11E-04	2.33E-06	< LLD	9.51E-04
4. Tritium						
H-3	Ci	4.40E+02	1.48E+02	2.31E+01	2.91E+01	6.40E+02

Table 19: Unit 2 Radiation Doses At And Beyond The Site Boundary						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	1.09E-03	1.42E-03	2.21E-04	4.18E-04	3.15E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.18E-02	2.84E-02	4.42E-03	8.36E-03	3.15E-02
Beta Air Dose	mrad	4.02E-04	1.25E-03	8.25E-05	1.57E-04	1.89E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	4.02E-03	1.25E-02	8.25E-04	1.57E-03	9.45E-03
Maximum Organ Dose (excluding skin)	mrem	1.58E-01	5.41E-02	8.28E-03	1.05E-02	2.31E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Thyroid	Thyroid	Lung	(1)	Thyroid
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	2.11E+00	7.21E-01	1.10E-01	1.40E-01	1.54E+00

Calculations are based on parameters and methodologies of the ODCM using historical meteorology. Dose is calculated to a hypothetical individual. In contrast, Appendix C dose calculations are based on concurrent meteorology, a real individual, and only the actual pathways present.

Note 1. - All organs except Bone.

Table 20: Unit 3 Gaseous Effluents - Summation Of All Releases							
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total For Year	Est. Total Error % (1)
A. Fission & activation gases							
1. Total release	Ci	6.68E-02	3.35E+00	6.65E-01	6.88E-02	4.15E+00	3.54E+01
2. Average release rate for period	μCi/sec	8.59E-03	4.26E-01	8.37E-02	8.66E-03	1.32E-01	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
B. Iodine 131							
1. Total Iodine 131	Ci	4.57E-05	5.46E-07	< LLD	< LLD	4.62E-05	3.32E+01
2. Average release rate for period	μCi/sec	5.88E-06	6.94E-08	< LLD	< LLD	1.46E-06	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
C. Particulates							
1. Particulates with half- lives > 8 days	Ci	5.88E-06	1.09E-06	1.15E-07	< LLD	7.08E-06	3.43E+01
2. Average release rate for period	μCi/sec	7.56E-07	1.39E-07	1.44E-08	< LLD	2.25E-07	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
4. Gross Alpha radioactivity	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	
D. Tritium							
1. Total release	Ci	9.35E+01	2.64E+01	8.36E+01	2.10E+02	4.14E+02	3.85E+01
2. Average release rate for period	μCi/sec	1.20E+01	3.36E+00	1.05E+01	2.64E+01	1.31E+01	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
(1) Estimated total error methodology is presented in Table 40.							
(2) See Table 27 for percent of ODCM Requirement limits.							

Table 21: Unit 3 Gaseous Effluents - Ground Level Releases - Continuous - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	< LLD	3.29E+00	< LLD	< LLD	3.29E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	5.85E-01	< LLD	5.85E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	3.29E+00	5.85E-01	< LLD	3.88E+00
2. Iodines						
I-131	Ci	4.57E-05	5.46E-07	< LLD	< LLD	4.62E-05
I-132	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	4.57E-05	5.46E-07	< LLD	< LLD	4.62E-05

**Table 22:
Unit 3
Gaseous Effluents - Ground Level Releases - Continuous - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	1.10E-06	1.09E-06	< LLD	< LLD	2.19E-06
Co-60	Ci	6.03E-07	< LLD	< LLD	< LLD	6.03E-07
Cr-51	Ci	2.52E-06	< LLD	< LLD	< LLD	2.52E-06
Cs-134	Ci	4.89E-07	< LLD	< LLD	< LLD	4.89E-07
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	1.09E-06	< LLD	< LLD	< LLD	1.09E-06
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	5.08E-08	< LLD	1.03E-07	< LLD	1.54E-07
Sr-90	Ci	2.27E-08	< LLD	1.15E-08	< LLD	3.41E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	5.87E-06	1.09E-06	1.14E-07	< LLD	7.08E-06
4. Tritium						
H-3	Ci	1.92E+01	2.64E+01	1.83E+01	1.45E+01	7.84E+01

Table 23: Unit 3 Gaseous Effluents - Ground Level Releases - Batch - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	6.68E-02	5.74E-02	8.03E-02	6.88E-02	2.73E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.68E-02	5.74E-02	8.03E-02	6.88E-02	2.73E-01
2. Iodines						
I-131	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-132	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	< LLD	< LLD

**Table 24:
Unit 3
Gaseous Effluents - Ground Level Releases - Batch - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-60	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
4. Tritium						
H-3	Ci	7.43E+01	9.72E-03	6.54E+01	1.96E+02	3.35E+02
Note 1 - Not required for batch releases						

Table 25: Unit 3 Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	6.68E-02	3.35E+00	8.03E-02	6.88E-02	3.57E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	5.85E-01	< LLD	5.85E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.68E-02	3.35E+00	6.65E-01	6.88E-02	4.15E+00
2. Iodines						
I-131	Ci	4.57E-05	5.46E-07	< LLD	< LLD	4.62E-05
I-132	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	4.57E-05	5.46E-07	< LLD	< LLD	4.62E-05

Table 26: Unit 3 Gaseous Effluents - Continuous and Batch - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	1.10E-06	1.09E-06	< LLD	< LLD	2.19E-06
Co-60	Ci	6.03E-07	< LLD	< LLD	< LLD	6.03E-07
Cr-51	Ci	2.52E-06	< LLD	< LLD	< LLD	2.52E-06
Cs-134	Ci	4.89E-07	< LLD	< LLD	< LLD	4.89E-07
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	1.09E-06	< LLD	< LLD	< LLD	1.09E-06
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	5.08E-08	< LLD	1.03E-07	< LLD	1.54E-07
Sr-90	Ci	2.27E-08	< LLD	1.15E-08	< LLD	3.41E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	5.87E-06	1.09E-06	1.14E-07	< LLD	7.08E-06
Total > 8 days	Ci	5.87E-06	1.09E-06	1.14E-07	< LLD	7.08E-06
4. Tritium						
H-3	Ci	9.35E+01	2.64E+01	8.36E+01	2.10E+02	4.14E+02

Table 27: Unit 3 Radiation Doses At And Beyond The Site Boundary						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	1.76E-04	8.80E-03	5.28E-04	1.81E-04	9.69E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	3.52E-03	1.76E-01	1.06E-02	3.62E-03	9.69E-02
Beta Air Dose	mrad	6.19E-05	3.10E-03	4.81E-04	6.38E-05	3.71E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	6.19E-04	3.10E-02	4.81E-03	6.38E-04	1.86E-02
Maximum Organ Dose (excluding skin)	mrem	3.41E-02	9.48E-03	3.00E-02	7.55E-02	1.49E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Thyroid	Thyroid	W. Body	(1)	Thyroid
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	4.55E-01	1.26E-01	4.00E-01	1.01E+00	9.93E-01

Calculations are based on parameters and methodologies of the ODCM using historical meteorology. Dose is calculated to a hypothetical individual. In contrast, Appendix C dose calculations are based on concurrent meteorology, a real individual, and only the actual pathways present.

Note 1 - All organs except Bone

**Table 28:
Units 1, 2, and 3
Gaseous Effluents - Continuous - Fission Gases and Iodines -
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	< LLD	3.29E+00	< LLD	< LLD	3.29E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	< LLD	1.16E+00	< LLD	< LLD	1.16E+00
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	5.85E-01	1.45E-01	7.30E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	4.45E+00	5.85E-01	1.45E-01	5.19E+00
2. Iodines						
I-131	Ci	1.39E-04	6.09E-05	1.09E-06	4.57E-05	2.47E-04
I-132	Ci	4.63E-05	7.39E-04	< LLD	< LLD	7.85E-04
I-133	Ci	< LLD	< LLD	< LLD	9.48E-06	9.48E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.85E-04	7.99E-04	1.09E-06	5.52E-05	1.04E-03

**Table 29:
Units 1, 2, and 3
Gaseous Effluents - Continuous - Particulates -
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	1.45E-05	6.05E-05	1.89E-06	5.41E-05	1.31E-04
Co-60	Ci	6.03E-07	9.83E-05	4.43E-07	4.34E-06	1.04E-04
Cr-51	Ci	2.34E-05	9.45E-05	< LLD	4.50E-05	1.63E-04
Cs-134	Ci	2.52E-06	< LLD	< LLD	< LLD	2.52E-06
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	2.69E-06	< LLD	< LLD	< LLD	2.69E-06
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	8.60E-07	8.60E-07
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	1.57E-06	5.53E-06	< LLD	3.69E-06	1.08E-05
Os-191	Ci	< LLD	4.36E-06	< LLD	4.52E-06	8.88E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	2.11E-07	2.11E-07
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	1.61E-07	< LLD	1.03E-07	< LLD	2.64E-07
Sr-90	Ci	4.46E-08	< LLD	1.15E-08	< LLD	5.61E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	2.59E-06	< LLD	4.41E-06	6.99E-06
Total	Ci	4.55E-05	2.66E-04	2.44E-06	1.17E-04	4.31E-04
4. Tritium						
H-3	Ci	4.88E+01	6.41E+01	5.88E+01	6.14E+01	2.33E+02

**Table 30:
Units 1, 2, and 3
Gaseous Effluents - Batch - Fission Gases and Iodines -
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	5.65E-01	5.95E-01	3.05E-01	2.75E-01	1.74E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	1.77E-01	< LLD	< LLD	1.77E-01
Kr-85m	Ci	2.18E-07	< LLD	< LLD	< LLD	2.18E-07
Kr-87	Ci	1.26E-07	< LLD	< LLD	< LLD	1.26E-07
Kr-88	Ci	3.01E-07	< LLD	< LLD	1.72E-04	1.73E-04
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	4.53E-03	4.53E-03
Xe-133	Ci	9.71E-02	1.29E+00	2.01E-01	3.69E-01	1.96E+00
Xe-133m	Ci	7.39E-07	< LLD	< LLD	1.17E-03	1.17E-03
Xe-135	Ci	3.04E-03	4.76E-02	6.74E-03	1.60E-03	5.90E-02
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.65E-01	2.11E+00	5.13E-01	6.51E-01	3.94E+00
2. Iodines						
I-131	Ci	< LLD	2.06E-06	< LLD	< LLD	2.06E-06
I-132	Ci	< LLD	4.31E-05	< LLD	5.89E-06	4.90E-05
I-133	Ci	< LLD	9.06E-08	5.30E-07	< LLD	6.21E-07
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	4.52E-05	5.30E-07	5.89E-06	5.17E-05

**Table 31:
Units 1, 2, and 3
Gaseous Effluents - Batch - Particulates -
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	4.03E-05	< LLD	4.76E-07	4.08E-05
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	2.62E-07	< LLD	< LLD	2.62E-07
Co-58	Ci	< LLD	2.12E-04	< LLD	1.37E-05	2.25E-04
Co-60	Ci	< LLD	3.31E-05	< LLD	4.96E-06	3.80E-05
Cr-51	Ci	< LLD	3.04E-04	< LLD	1.14E-05	3.16E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	7.31E-08	< LLD	< LLD	7.31E-08
Cs-138	Ci	2.99E-07	< LLD	< LLD	< LLD	2.99E-07
Fe-59	Ci	< LLD	4.36E-06	< LLD	< LLD	4.36E-06
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	9.13E-06	< LLD	7.61E-05	8.53E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	4.83E-05	< LLD	5.11E-06	5.34E-05
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	3.36E-07	< LLD	< LLD	< LLD	3.36E-07
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	3.51E-05	< LLD	3.43E-06	3.85E-05
Total	Ci	6.36E-07	6.87E-04	< LLD	1.15E-04	8.02E-04
4. Tritium						
H-3	Ci	5.91E+02	2.94E+02	5.96E+02	3.10E+02	1.79E+03
Note 1 - Not required for batch releases						

Table 32:
Units 1, 2, and 3
Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines -
Total By Quarter

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
1. Fission gases						
Ar-41	Ci	5.65E-01	3.89E+00	3.05E-01	2.75E-01	5.03E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	1.77E-01	< LLD	< LLD	1.77E-01
Kr-85m	Ci	2.18E-07	< LLD	< LLD	< LLD	2.18E-07
Kr-87	Ci	1.26E-07	< LLD	< LLD	< LLD	1.26E-07
Kr-88	Ci	3.01E-07	< LLD	< LLD	1.72E-04	1.73E-04
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	4.53E-03	4.53E-03
Xe-133	Ci	9.71E-02	2.45E+00	2.01E-01	3.69E-01	3.12E+00
Xe-133m	Ci	7.39E-07	< LLD	< LLD	1.17E-03	1.17E-03
Xe-135	Ci	3.04E-03	4.76E-02	5.92E-01	1.47E-01	7.89E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.65E-01	6.56E+00	1.10E+00	7.97E-01	9.12E+00
2. Iodines						
I-131	Ci	1.39E-04	6.30E-05	1.09E-06	4.57E-05	2.49E-04
I-132	Ci	4.63E-05	7.82E-04	< LLD	5.89E-06	8.34E-04
I-133	Ci	< LLD	9.06E-08	5.30E-07	9.48E-06	1.01E-05
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.85E-04	8.45E-04	1.62E-06	6.11E-05	1.09E-03

**Table 33:
Units 1, 2, and 3
Gaseous Effluents - Continuous and Batch - Particulates -
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	4.03E-05	< LLD	4.76E-07	4.08E-05
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	2.62E-07	< LLD	< LLD	2.62E-07
Co-58	Ci	1.45E-05	2.72E-04	1.89E-06	6.78E-05	3.56E-04
Co-60	Ci	6.03E-07	1.31E-04	4.43E-07	9.30E-06	1.42E-04
Cr-51	Ci	2.34E-05	3.99E-04	< LLD	5.64E-05	4.79E-04
Cs-134	Ci	2.52E-06	< LLD	< LLD	< LLD	2.52E-06
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	2.69E-06	7.31E-08	< LLD	< LLD	2.76E-06
Cs-138	Ci	2.99E-07	< LLD	< LLD	< LLD	2.99E-07
Fe-59	Ci	< LLD	4.36E-06	< LLD	< LLD	4.36E-06
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	9.13E-06	< LLD	7.70E-05	8.61E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	1.57E-06	5.38E-05	< LLD	8.80E-06	6.42E-05
Os-191	Ci	< LLD	4.36E-06	< LLD	4.52E-06	8.88E-06
Rb-88	Ci	3.36E-07	< LLD	< LLD	< LLD	3.36E-07
Ru-103	Ci	< LLD	< LLD	< LLD	2.11E-07	2.11E-07
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	1.61E-07	< LLD	1.03E-07	< LLD	2.64E-07
Sr-90	Ci	4.46E-08	< LLD	1.15E-08	< LLD	5.61E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	3.77E-05	< LLD	7.84E-06	4.55E-05
Total	Ci	4.61E-05	9.52E-04	2.44E-06	2.32E-04	1.23E-03
Total > 8 days	Ci	4.55E-05	9.12E-04	2.44E-06	2.32E-04	1.19E-03
4. Tritium						
H-3	Ci	6.40E+02	3.58E+02	6.55E+02	3.71E+02	2.02E+03

**Table 34:
Units 1, 2 and 3
Gaseous Effluents- Continuous - Fission Gases and Iodine -
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
1. Fission gases					
Ar-41	Ci	< LLD	< LLD	3.29E+00	3.29E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	< LLD	1.16E+00	< LLD	1.16E+00
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	1.45E-01	< LLD	5.85E-01	7.30E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.45E-01	1.16E+00	3.88E+00	5.19E+00
2. Iodines					
I-131	Ci	9.13E-05	1.09E-04	4.62E-05	2.47E-04
I-132	Ci	4.63E-05	7.39E-04	< LLD	7.85E-04
I-133	Ci	9.48E-06	< LLD	< LLD	9.48E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.47E-04	8.48E-04	4.62E-05	1.04E-03

**Table 35:
Units 1, 2 and 3
Gaseous Effluents- Continuous - Particulates -
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
3. Particulates					
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	5.41E-05	7.46E-05	2.19E-06	1.31E-04
Co-60	Ci	4.34E-06	9.87E-05	6.03E-07	1.04E-04
Cr-51	Ci	4.50E-05	1.15E-04	2.52E-06	1.63E-04
Cs-134	Ci	1.02E-06	1.01E-06	4.89E-07	2.52E-06
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	9.48E-07	6.55E-07	1.09E-06	2.69E-06
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	8.60E-07	< LLD	< LLD	8.60E-07
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	3.69E-06	7.11E-06	< LLD	1.08E-05
Os-191	Ci	4.52E-06	4.36E-06	< LLD	8.88E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	2.11E-07	< LLD	< LLD	2.11E-07
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	4.91E-08	6.13E-08	1.54E-07	2.64E-07
Sr-90	Ci	2.19E-08	< LLD	3.41E-08	5.61E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	4.41E-06	2.59E-06	< LLD	6.99E-06
Total	Ci	1.19E-04	3.05E-04	7.08E-06	4.31E-04
4. Tritium					
H-3	Ci	6.57E+01	8.90E+01	7.84E+01	2.33E+02

**Table 36:
Units 1, 2 and 3
Gaseous Effluents- Batch - Fission Gases and Iodine -
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
1. Fission gases					
Ar-41	Ci	3.73E-01	1.09E+00	2.73E-01	1.74E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	1.77E-01	< LLD	1.77E-01
Kr-85m	Ci	< LLD	2.18E-07	< LLD	2.18E-07
Kr-87	Ci	< LLD	1.26E-07	< LLD	1.26E-07
Kr-88	Ci	< LLD	1.73E-04	< LLD	1.73E-04
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	4.53E-03	< LLD	< LLD	4.53E-03
Xe-133	Ci	5.88E-01	1.37E+00	< LLD	1.96E+00
Xe-133m	Ci	1.17E-03	7.39E-07	< LLD	1.17E-03
Xe-135	Ci	1.00E-02	4.90E-02	< LLD	5.90E-02
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	9.77E-01	2.69E+00	2.73E-01	3.94E+00
2. Iodines					
I-131	Ci	< LLD	2.06E-06	< LLD	2.06E-06
I-132	Ci	5.89E-06	4.31E-05	< LLD	4.90E-05
I-133	Ci	6.21E-07	< LLD	< LLD	6.21E-07
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.51E-06	4.52E-05	< LLD	5.17E-05

**Table 37:
Units 1, 2 and 3
Gaseous Effluents- Batch - Particulates -
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1,2 and 3
3. Particulates					
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	4.76E-07	4.03E-05	< LLD	4.08E-05
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	2.62E-07	< LLD	2.62E-07
Co-58	Ci	1.37E-05	2.12E-04	< LLD	2.25E-04
Co-60	Ci	4.96E-06	3.31E-05	< LLD	3.80E-05
Cr-51	Ci	1.14E-05	3.04E-04	< LLD	3.16E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	7.31E-08	< LLD	7.31E-08
Cs-138	Ci	< LLD	2.99E-07	< LLD	2.99E-07
Fe-59	Ci	< LLD	4.36E-06	< LLD	4.36E-06
La-140	Ci	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	7.61E-05	9.13E-06	< LLD	8.53E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	5.11E-06	4.83E-05	< LLD	5.34E-05
Os-191	Ci	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	3.36E-07	< LLD	3.36E-07
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	3.43E-06	3.51E-05	< LLD	3.85E-05
Total	Ci	1.15E-04	6.87E-04	< LLD	8.02E-04
4. Tritium					
H-3	Ci	9.04E+02	5.51E+02	3.35E+02	1.79E+03
Note 1 - Not required for batch releases					

**Table 38:
Units 1, 2 and 3.
Gaseous Effluents- Continuous and Batch - Fission Gases and Iodine -
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
1. Fission gases					
Ar-41	Ci	3.73E-01	1.09E+00	3.57E+00	5.03E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	1.77E-01	< LLD	1.77E-01
Kr-85m	Ci	< LLD	2.18E-07	< LLD	2.18E-07
Kr-87	Ci	< LLD	1.26E-07	< LLD	1.26E-07
Kr-88	Ci	< LLD	1.73E-04	< LLD	1.73E-04
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	4.53E-03	< LLD	< LLD	4.53E-03
Xe-133	Ci	5.88E-01	2.53E+00	< LLD	3.12E+00
Xe-133m	Ci	1.17E-03	7.39E-07	< LLD	1.17E-03
Xe-135	Ci	1.55E-01	4.90E-02	5.85E-01	7.89E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.12E+00	3.85E+00	4.15E+00	9.12E+00
2. Iodines					
I-131	Ci	9.13E-05	1.11E-04	4.62E-05	2.49E-04
I-132	Ci	5.22E-05	7.82E-04	< LLD	8.34E-04
I-133	Ci	1.01E-05	< LLD	< LLD	1.01E-05
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.54E-04	8.93E-04	4.62E-05	1.09E-03

**Table 39:
Units 1, 2 and 3
Gaseous Effluents - Continuous and Batch - Particulates -
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
3. Particulates					
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	4.76E-07	4.03E-05	< LLD	4.08E-05
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	2.62E-07	< LLD	2.62E-07
Co-58	Ci	6.78E-05	2.86E-04	2.19E-06	3.56E-04
Co-60	Ci	9.30E-06	1.32E-04	6.03E-07	1.42E-04
Cr-51	Ci	5.64E-05	4.20E-04	2.52E-06	4.79E-04
Cs-134	Ci	1.02E-06	1.01E-06	4.89E-07	2.52E-06
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	9.48E-07	7.28E-07	1.09E-06	2.76E-06
Cs-138	Ci	< LLD	2.99E-07	< LLD	2.99E-07
Fe-59	Ci	< LLD	4.36E-06	< LLD	4.36E-06
La-140	Ci	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	7.70E-05	9.13E-06	< LLD	8.61E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	8.80E-06	5.54E-05	< LLD	6.42E-05
Os-191	Ci	4.52E-06	4.36E-06	< LLD	8.88E-06
Rb-88	Ci	< LLD	3.36E-07	< LLD	3.36E-07
Ru-103	Ci	2.11E-07	< LLD	< LLD	2.11E-07
Ru-106	Ci	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	4.91E-08	6.13E-08	1.54E-07	2.64E-07
Sr-90	Ci	2.19E-08	< LLD	3.41E-08	5.61E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	7.84E-06	3.77E-05	< LLD	4.55E-05
Total	Ci	2.34E-04	9.92E-04	7.08E-06	1.23E-03
Total > 8 days	Ci	2.34E-04	9.51E-04	7.08E-06	1.19E-03
4. Tritium					
H-3	Ci	9.70E+02	6.40E+02	4.14E+02	2.02E+03

**Table 40:
Estimation of Total Percent Error**

The estimated total error is calculated as follows:

$$\text{Total Percent Error} = (E_1^2 + E_2^2 + E_3^2 + \dots + E_n^2)^{1/2}$$

Where E_n = Percent error associated with each contributing parameter.

Parameters contributing to errors in the measurement of gaseous effluents; process flow rates, sample collection, analytical counting and tank volumes.

The following values (%) were used for error calculations.

Fission & Act gases	I-131	Particulates	Tritium	
25	25	25	25	Sample counting error
10	10	10	10	Counting system calibration error
5	5	5	5	Counting system source error
20	N/A	N/A	N/A	Temperature/volume correction error
10	10	10	10	Process flow measuring device ⁽¹⁾
N/A	15	15	15	Sample flow measuring device
N/A	5	N/A	N/A	Iodine collection efficiency error
N/A	N/A	10	N/A	Plateout error
N/A	N/A	N/A	20	Bubbler collection efficiency error
N/A	N/A	N/A	2	Sample volume transfer error (pipette)
N/A	N/A	N/A	2	Sample volume error (graduate)
Note 1 - % of full scale				

**Table 41:
Effluent Monitoring Instrumentation Out Of Service Greater Than 30 Days**

Unit	Instrument	Date span of inoperability	Cause of inoperability	Explanation
NONE				

**Table 42:
Solid Waste Summary**

A. Solid Waste Shipped Offsite For Burial Or Disposal (not irradiated fuel)

1.0 Type of Waste	Unit	Jan-Dec	estimated total error %
1.a. Spent resin, filters, sludges, evaporator bottoms, etc.	m ³	6.97E+01	N/A
	Ci	6.90E+00	2.50E+01
1.b. Dry compressible waste, contaminated equipment, etc.	m ³	9.07E+02	N/A
	Ci	1.87E+00	2.50E+01
1.c. Irradiated components, control rods, etc.	m ³	0.00E+00	N/A
	Ci	0.00E+00	2.50E+01
1.d. Other	m ³	1.87E+01	N/A
	Ci	2.63E-03	2.50E+01

2.0 Principal Radionuclides

2.a Estimate of major nuclide concentrations for spirit resin; filters, sludges, evaporator bottoms, etc.		
Nuclide Name	Percent Abundance	Curies
Ni-63	4.26E+01	2.94E+00
Fe-55	1.50E+01	1.03E+00
C-14	1.27E+01	8.74E-01
H-3	1.04E+01	7.16E-01
Co-60	1.03E+01	7.08E-01
Cs-137	6.13E+00	4.23E-01
Sb-125	8.28E-01	5.71E-02
Cs-134	7.36E-01	5.08E-02
Co-58	6.27E-01	4.33E-02
Ni-59	2.52E-01	1.74E-02
Pu-241	1.45E-01	1.00E-02
Mn-54	1.18E-01	8.17E-03
Ag-110m	9.69E-02	6.69E-03
Co-57	7.24E-02	5.00E-03
Sr-90	4.86E-02	3.36E-03
Tc-99	3.36E-02	2.32E-03
Ce-144	1.09E-02	7.53E-04
Cm-243	9.20E-03	6.35E-04
Am-241	8.83E-03	6.09E-04
Pu-238	8.57E-03	5.91E-04
Pu-239	3.60E-03	2.49E-04
Sr-89	3.14E-04	2.17E-05
Nb-95	6.02E-05	4.15E-06
Cm-242	2.26E-05	1.56E-06
Zr-95	1.42E-08	9.80E-10
	Total	6.90E+00

2.b Estimate of major nuclide concentrations for dry compressible waste, contaminated equipment, etc.		
Nuclide Name	Percent Abundance	Curies
Fe-55	7.77E+01	1.45E+00
Co-60	6.25E+00	1.17E-01
Co-58	5.69E+00	1.06E-01
Ni-63	5.62E+00	1.05E-01
Cr-51	1.03E+00	1.93E-02
Zr-95	6.11E-01	1.14E-02
Nb-95	6.04E-01	1.13E-02
H-3	5.93E-01	1.11E-02
C-14	5.59E-01	1.04E-02
Mn-54	3.80E-01	7.10E-03
Cs-137	2.86E-01	5.33E-03
Ni-59	2.30E-01	4.30E-03
Sb-125	2.09E-01	3.90E-03
Fe-59	7.88E-02	1.47E-03
Co-57	5.13E-02	9.57E-04
Pu-241	4.23E-02	7.90E-04
Ce-144	2.81E-02	5.24E-04
Sn-113	2.46E-02	4.59E-04
Cs-134	1.31E-02	2.44E-04
Sr-89	8.49E-03	1.58E-04
Zn-65	7.89E-03	1.47E-04
Am-241	4.68E-03	8.72E-05
Sb-124	4.60E-03	8.58E-05
Te-123m	3.43E-03	6.40E-05
Sr-90	3.21E-03	5.99E-05
Pu-239	1.79E-03	3.34E-05
Hf-181	1.67E-03	3.12E-05
Pu-238	1.65E-03	3.08E-05
Cm-243	1.65E-03	3.08E-05
Ag-110m	3.80E-04	7.09E-06
Ce-141	1.67E-04	3.12E-06
Cm-242	9.77E-05	1.82E-06
Tc-99	9.00E-07	1.68E-08
I-125	1.11E-12	2.07E-14
Ru-103	1.07E-12	2.00E-14
	Total	1.87E+00

2.c Estimate of major nuclide concentrations for irradiated components, control rods, etc.

None

2.d Other

2.d.1 Oil		
Nuclide Name	Percent Abundance	Curies
H-3	9.98E+01	2.63E-03
Co-60	8.98E-02	2.36E-06
Ce-144 D	8.39E-02	2.21E-06
Cs-137 D	5.35E-02	1.41E-06
Cs-134	1.97E-03	5.17E-08
Total		2.63E-03

3.0 Solid Waste Disposition

3.a

Shipments	Mode Of Transportation	Destination
44	Truck	EnergySolutions, UT (Bulk Waste Facility)
2	Truck	EnergySolutions, TN

3.b Irradiated Fuel Shipments: None

3.c Supplemental Information:

Number of Containers	Type of Waste	Container Type	Solidification Agent
6	Evaporator Bottoms-Concentrates	20' Sealand	None
1	Evaporator Bottoms-Concentrates	40' Sealand	None
3	Evaporator Bottoms-Concentrates	Intermodal	None
43	Dry Active Waste	20' Sealand	None
10	Dry Active Waste	20' Intermodal	None
5	Dry Active Waste	Poly Wrap	None
11	Dry Active Waste	B-25 Type A	None
2	Oil	20' Sealand	None

APPENDIX B
METEOROLOGY

JOINT FREQUENCY DISTRIBUTION TABLES

The tables presented in this section are results obtained from processing the hourly meteorological data collected at the Palo Verde Nuclear Generating Station for the period of January - December 2011. The joint frequency distribution (JFD) tables represent the frequency, in terms of the number of observations, that a particular wind speed, wind direction, and stability category occurred simultaneously. On a quarterly, semiannual and annual basis, the JFDs were produced for 35-foot wind speed and wind direction by atmospheric stability class corresponding to the seven Pasquill stability categories, and for wind speed and wind direction for all stability classes combined. Atmospheric stability was classified per Regulatory Guide 1.23, using the 200-foot to 35-foot temperature difference (ΔT).

In accordance with NUREG-0133, the batch releases for the year were considered as "long term," since the batch releases are sufficiently random in both time of day and duration. Consequently, the JFDs for the batch releases for all quarters are the same as for the continuous releases.

Discussion

A summary of 2011 Joint Frequency Distribution (JFD) shows a somewhat typical, but variable year. Of the 8760 hours available, 78 hours of data were lost due to a communication line failure for an effective data recovery of 99.1%.

The average 35 foot wind speed was 6.9 mph. Distribution of directions was spread over the compass with a predominant direction (3 sectors of 22.5 degrees each) centered on southwest. (36.1%) A secondary maximum of three sectors centered on the north contained 26.4% of the total. Southwesterly flow winds averaged higher speeds with the most frequent speed at 10 mph. With the northerly directions, the highest frequency occurred at 4.0 mph.

Stability class summary:

Stability class E, F, G, (stable categories) 57.7%.
Stability class G, (extremely stable) 25.5%.
Stability class A, B, C, (unstable categories) 23.6%.
Stability class D, (neutral category) 18.7%.

Overall stable conditions (E,F,G) existed for the year.

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2011 TO 3/31/2011

*** 1ST QRTR ***

STABILITY CLASS A
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5.51- 6.50	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	3
6.51- 8.50	0	0	1	0	0	3	0	0	2	2	1	2	0	1	0	0	12
8.51-11.50	1	0	0	0	0	0	0	0	0	2	10	2	0	0	2	1	18
11.51-14.50	1	0	1	0	0	0	0	0	0	7	3	2	0	1	4	19	
14.51-20.50	7	0	3	0	0	0	0	0	0	5	3	0	0	0	0	18	
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	
TOTAL	9	0	5	0	1	3	0	0	2	4	18	13	6	2	4	5	72

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	3
4.51- 5.50	0	1	1	1	0	0	0	0	1	1	1	1	2	0	0	0	9
5.51- 6.50	0	2	2	1	0	1	2	1	0	4	4	0	0	0	0	0	17
6.51- 8.50	0	1	3	1	0	0	3	5	4	6	6	6	0	0	0	0	29
8.51-11.50	0	0	1	0	0	0	0	0	0	6	0	2	1	1	1	0	11
11.51-14.50	1	0	0	1	0	0	0	0	0	1	1	2	1	2	1	0	10
14.51-20.50	0	1	0	0	0	0	0	0	0	1	2	0	1	2	0	0	7
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	5	7	4	0	1	2	4	6	10	19	10	7	4	5	1	86

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2
3.51- 4.50	1	1	1	0	0	2	1	1	0	1	1	2	0	0	0	0	11
4.51- 5.50	2	2	1	0	0	0	1	0	7	6	2	0	1	2	1	2	27
5.51- 6.50	1	3	8	1	0	0	2	0	4	8	3	6	1	1	1	1	40
6.51- 8.50	0	3	4	0	0	1	2	2	1	4	2	3	6	0	0	0	28
8.51-11.50	0	1	1	4	2	1	0	0	0	2	3	3	1	0	1	0	19
11.51-14.50	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	3
14.51-20.50	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	3
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TOTAL	5	10	16	5	3	4	6	3	12	21	13	15	11	4	3	3	134

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2011 TO 3/31/2011

*** 1ST QTR ***

STABILITY CLASS D
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	1	2	0	0	1	3	4	0	3	5	1	4	2	2	3	1	32
2.51- 3.50	4	2	5	4	4	1	4	4	11	14	14	14	10	3	4	8	106
3.51- 4.50	1	7	9	2	1	2	2	0	15	20	25	9	8	3	1	4	109
4.51- 5.50	1	3	8	1	2	0	2	1	15	11	15	4	2	1	1	3	70
5.51- 6.50	0	5	6	2	1	2	0	2	6	4	4	5	1	0	1	1	40
6.51- 8.50	1	3	3	1	1	0	3	1	4	5	5	2	5	0	0	0	34
8.51-11.50	1	0	3	2	2	0	2	3	2	3	9	3	1	2	0	1	34
11.51-14.50	2	0	1	1	1	0	0	2	2	3	3	2	1	3	1	1	23
14.51-20.50	0	0	0	0	2	0	0	0	1	2	0	2	0	2	2	0	11
>20.50	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
TOTAL	11	22	35	13	15	8	17	13	59	68	77	45	30	16	13	19	461

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
1.51- 2.50	1	2	0	2	0	2	0	2	1	1	4	3	3	4	5	1	31
2.51- 3.50	1	0	1	1	2	1	0	1	4	2	6	9	6	1	3	3	41
3.51- 4.50	2	1	1	2	0	1	1	0	4	1	3	2	0	3	3	2	26
4.51- 5.50	3	3	2	0	0	0	0	0	3	5	7	2	0	1	0	1	27
5.51- 6.50	0	1	0	1	0	0	0	2	2	3	7	1	2	1	1	0	21
6.51- 8.50	1	2	0	0	0	1	0	0	2	7	11	6	3	1	3	1	38
8.51-11.50	0	1	2	0	2	0	2	4	4	4	14	7	7	3	2	0	52
11.51-14.50	1	0	2	0	2	0	0	1	3	2	5	1	2	6	3	1	29
14.51-20.50	1	0	1	0	0	0	0	0	2	1	1	2	1	3	1	8	21
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
TOTAL	10	10	9	6	6	5	3	10	25	27	58	33	24	23	21	19	289

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1.51- 2.50	2	2	3	0	0	0	0	1	0	1	2	3	2	3	7	2	28
2.51- 3.50	9	3	1	1	0	0	2	1	1	1	2	5	8	18	10	8	70
3.51- 4.50	10	3	3	0	0	0	0	0	0	3	2	4	4	5	8	8	50
4.51- 5.50	5	4	0	1	1	0	0	1	1	1	2	7	3	3	7	5	41
5.51- 6.50	3	1	0	0	0	0	0	0	0	4	8	5	2	4	2	6	35
6.51- 8.50	3	3	0	0	0	1	0	0	5	1	10	9	1	4	7	9	53
8.51-11.50	3	6	0	0	0	0	0	1	0	1	5	2	0	1	3	2	24
11.51-14.50	0	2	0	0	0	0	0	0	1	0	1	0	0	0	0	2	6
14.51-20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	35	24	7	2	1	1	2	4	8	12	34	35	20	38	44	42	309

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2011 TO 3/31/2011

*** 1ST QRTR ***

STABILITY CLASS G
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3
1.51- 2.50	6	5	2	1	0	1	2	1	0	3	3	2	7	7	10	9	59
2.51- 3.50	36	20	6	1	2	0	2	0	2	0	3	6	12	19	31	31	171
3.51- 4.50	70	20	10	2	0	0	0	0	0	3	2	4	3	12	33	65	224
4.51- 5.50	83	26	7	3	1	0	0	0	0	0	0	1	3	3	11	33	171
5.51- 6.50	29	19	1	0	0	0	0	0	0	1	0	1	1	1	4	15	72
6.51- 8.50	32	18	2	0	0	0	0	0	0	0	0	1	2	0	1	16	72
8.51-11.50	13	18	1	0	0	0	0	0	0	0	0	0	0	0	0	4	36
11.51-14.50	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	269	127	29	7	3	1	4	1	2	7	8	15	30	42	91	173	809

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	1	1	0	2	0	1	0	5
1.51- 2.50	10	11	5	3	1	6	6	4	4	10	10	12	14	16	25	13	150
2.51- 3.50	50	25	13	7	8	2	8	6	18	17	25	35	37	41	48	50	390
3.51- 4.50	84	32	24	6	1	5	4	1	19	29	33	21	16	24	45	79	423
4.51- 5.50	94	39	19	6	4	0	3	2	27	24	27	15	11	10	21	44	346
5.51- 6.50	33	31	17	5	2	3	4	5	12	24	26	19	7	8	9	23	228
6.51- 8.50	37	30	13	2	1	6	5	6	19	23	35	29	17	6	11	26	266
8.51-11.50	18	26	8	6	6	1	4	8	6	12	47	17	11	7	9	8	194
11.51-14.50	5	3	5	2	3	0	0	3	6	5	19	7	7	10	7	9	91
14.51-20.50	9	1	4	0	3	0	0	0	3	3	3	11	4	7	5	8	61
>20.50	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	2	6
TOTAL	340	198	108	37	29	23	34	35	114	149	227	166	128	129	181	262	2160

TOTAL NUMBER OF OBSERVATIONS: 2160
 TOTAL NUMBER OF VALID OBSERVATIONS: 2160
 TOTAL NUMBER OF MISSING OBSERVATIONS: 0
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %
 MEAN WIND SPEED FOR THIS PERIOD: 5.8 MPH
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES
 A 3.33 B 3.98 C 6.20 D 21.34 E 13.38 F 14.31 G 37.45

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	9	0	5	0	1	3	0	0	2	4	18	13	6	2	4	5	0
B	1	5	7	4	0	1	2	4	6	10	19	10	7	4	5	1	0
C	5	10	16	5	3	4	6	3	12	21	13	15	11	4	3	0	0
D	11	22	35	13	15	8	17	13	59	68	77	45	30	16	13	19	0
E	10	10	9	6	6	5	3	10	25	27	58	33	24	23	21	19	0
F	35	24	7	2	1	1	2	4	8	12	34	35	20	38	44	42	0
G	269	127	29	7	3	1	4	1	2	7	8	15	30	42	91	173	0
TOTAL	340	198	108	37	29	23	34	35	114	149	227	166	128	129	181	262	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2011 TO 6/30/2011

*** 2ND QTR ***

STABILITY CLASS A

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	1	0	0	0	2	0	3	1	0	1	0	0	0	8
5.51- 6.50	1	0	1	1	1	0	2	1	3	7	3	2	0	0	1	0	23
6.51- 8.50	2	1	0	1	2	1	0	5	14	16	21	10	0	1	0	3	77
8.51-11.50	1	1	2	0	1	3	0	2	9	34	51	28	10	0	2	4	148
11.51-14.50	1	0	2	2	2	1	0	3	12	56	8	7	8	7	2	111	111
14.51-20.50	0	0	0	0	3	0	0	0	0	3	64	13	5	3	4	2	97
>20.50	0	0	0	0	0	0	0	0	0	0	7	7	0	0	0	0	14
TOTAL	5	2	5	5	9	5	2	10	29	75	203	68	23	12	14	11	478

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	3
4.51- 5.50	0	1	0	0	0	0	0	3	5	3	5	0	0	1	0	0	18
5.51- 6.50	0	0	1	1	1	2	3	2	11	8	6	0	1	3	0	0	39
6.51- 8.50	1	1	0	2	3	1	3	4	8	9	8	4	2	0	0	0	46
8.51-11.50	0	0	0	2	0	2	0	0	2	3	15	5	3	1	0	0	33
11.51-14.50	1	0	0	0	0	0	0	0	0	2	10	4	0	1	1	0	19
14.51-20.50	0	0	1	0	1	0	0	0	0	4	4	4	2	0	1	0	13
>20.50	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
TOTAL	2	2	2	5	6	5	6	9	26	25	49	19	8	6	2	1	173

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	0	1	0	1	0	0	3	3	2	1	4	0	0	0	0	15
4.51- 5.50	0	0	1	0	3	2	0	0	9	3	1	1	2	1	0	0	23
5.51- 6.50	0	0	1	1	2	1	0	0	10	2	7	0	0	0	0	2	26
6.51- 8.50	0	0	1	0	1	0	0	0	1	3	5	2	1	2	2	1	19
8.51-11.50	1	0	0	0	0	0	0	0	1	3	4	1	1	0	0	0	11
11.51-14.50	0	0	0	0	0	0	0	0	0	0	5	0	0	2	2	1	10
14.51-20.50	0	0	0	1	0	0	0	0	0	2	4	2	0	1	1	0	11
>20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTAL	1	0	4	3	7	3	0	3	24	15	28	10	4	6	5	4	117

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2011 TO 6/30/2011

*** 2ND QTR ***

STABILITY CLASS D

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1.51- 2.50	2	0	1	0	2	0	1	1	1	1	1	1	2	2	1	0	16
2.51- 3.50	1	2	1	3	2	4	3	2	7	2	4	3	0	1	1	1	37
3.51- 4.50	2	2	4	3	3	1	2	1	4	11	0	1	1	0	3	3	41
4.51- 5.50	0	1	0	1	1	6	0	4	0	4	4	2	2	0	1	0	26
5.51- 6.50	0	1	0	0	1	2	0	1	2	2	1	2	3	1	0	1	17
6.51- 8.50	0	0	0	1	1	0	0	0	1	3	12	5	2	0	3	2	30
8.51-11.50	1	1	0	0	1	0	2	1	0	4	15	6	4	2	0	0	37
11.51-14.50	1	2	0	0	1	0	0	0	0	3	14	3	0	3	3	2	32
14.51-20.50	0	0	0	0	0	0	0	0	0	5	14	5	6	4	1	0	35
>20.50	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	5
TOTAL	7	9	6	8	12	13	8	10	15	35	66	31	22	13	13	9	277

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	1	2	1	1	0	0	1	0	1	0	1	1	2	1	0	1	13
2.51- 3.50	2	2	2	1	0	0	0	0	0	0	2	0	3	0	0	2	14
3.51- 4.50	2	3	1	1	1	0	0	0	1	2	9	4	2	0	0	0	26
4.51- 5.50	0	1	1	0	0	0	0	0	0	3	3	3	3	2	2	1	19
5.51- 6.50	0	2	1	0	0	0	0	0	2	6	8	3	3	3	0	0	28
6.51- 8.50	1	1	0	2	0	0	0	0	0	15	22	16	7	4	1	3	72
8.51-11.50	0	0	0	0	1	0	0	0	1	24	42	33	11	6	4	4	126
11.51-14.50	2	0	0	1	0	0	0	0	0	13	35	9	8	3	2	2	75
14.51-20.50	0	0	0	0	0	1	0	0	0	2	22	7	3	1	2	0	38
>20.50	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TOTAL	8	11	6	6	2	1	1	0	5	65	144	77	42	20	11	13	412

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	1	0	1	0	0	1	1	0	1	1	4	1	3	4	18
2.51- 3.50	4	2	0	1	1	0	0	1	2	3	2	6	4	3	4	2	35
3.51- 4.50	3	4	0	1	0	0	0	0	5	7	12	6	6	3	2	2	45
4.51- 5.50	1	1	0	0	0	0	0	1	0	4	9	6	6	1	1	4	34
5.51- 6.50	0	1	1	0	0	0	0	0	1	7	13	9	6	3	6	1	48
6.51- 8.50	4	2	0	0	0	0	0	0	0	18	31	24	7	4	2	2	94
8.51-11.50	2	1	0	0	0	0	0	0	0	11	38	10	2	2	3	5	74
11.51-14.50	0	2	0	0	0	0	0	0	0	1	3	0	0	0	0	2	8
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	14	13	2	2	2	0	0	3	4	49	104	68	35	17	21	22	356

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2011 TO 6/30/2011

*** 2ND QRTR ***

STABILITY CLASS G
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	1	0	0	0	1	2	0	1	0	1	0	0	2	4	2	2	16
2.51- 3.50	12	9	1	0	0	1	1	1	0	1	1	5	2	7	4	12	57
3.51- 4.50	30	18	4	1	2	0	0	0	1	4	6	3	6	5	11	91	91
4.51- 5.50	18	17	3	1	0	0	0	0	0	0	3	1	3	1	3	7	57
5.51- 6.50	6	7	3	0	0	0	0	0	0	0	1	2	2	1	0	1	23
6.51- 8.50	9	14	2	0	0	0	0	0	0	0	3	4	0	1	1	2	36
8.51-11.50	2	5	0	0	0	0	0	0	0	1	4	0	0	0	0	1	13
11.51-14.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	78	70	13	2	3	3	1	2	0	4	16	18	12	20	15	36	293

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1.51- 2.50	4	2	3	1	4	2	2	3	3	2	3	3	10	8	6	7	63
2.51- 3.50	19	15	4	6	3	5	4	4	9	6	9	14	9	11	9	17	144
3.51- 4.50	37	27	10	6	8	1	2	4	8	21	22	27	12	9	10	17	221
4.51- 5.50	19	21	5	3	4	8	0	10	14	20	26	13	17	6	7	12	185
5.51- 6.50	7	11	8	3	5	5	5	4	29	32	39	18	15	11	7	5	204
6.51- 8.50	17	19	3	6	7	2	3	9	24	64	102	65	19	12	9	13	374
8.51-11.50	7	8	2	2	3	5	2	3	13	80	169	83	31	11	9	14	442
11.51-14.50	5	4	2	3	3	1	0	0	3	31	123	24	15	17	15	9	255
14.51-20.50	0	0	1	1	4	1	0	0	0	12	108	31	16	9	9	2	194
>20.50	0	0	0	0	0	0	0	0	0	0	8	13	2	0	0	0	23
TOTAL	115	107	38	31	41	30	18	37	103	268	610	291	146	94	81	96	2106

TOTAL NUMBER OF OBSERVATIONS: 2184
 TOTAL NUMBER OF VALID OBSERVATIONS: 2106
 TOTAL NUMBER OF MISSING OBSERVATIONS: 78
 PERCENT DATA RECOVERY FOR THIS PERIOD: 96.4 %
 MEAN WIND SPEED FOR THIS PERIOD: 8.5 MPH
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES							
A	B	C	D	E	F	G	
22.70	8.21	5.56	13.15	19.56	16.90	13.91	

	DISTRIBUTION OF WIND DIRECTION VS STABILITY																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	5	2	5	5	9	5	2	10	29	75	203	68	23	12	14	11	0
B	2	2	2	5	6	5	6	9	26	25	49	19	8	6	2	1	0
C	1	0	4	3	7	3	0	3	24	15	28	10	4	6	5	4	0
D	7	9	6	8	12	13	8	10	15	35	66	31	22	13	13	9	0
E	8	11	6	6	2	1	1	0	5	65	144	77	42	20	11	13	0
F	14	13	2	2	2	0	0	3	4	49	104	68	35	17	21	22	0
G	78	70	13	2	3	3	1	2	0	4	16	18	12	20	15	36	0
TOTAL	115	107	38	31	41	30	18	37	103	268	610	291	146	94	81	96	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2011 TO 6/30/2011

*** 1ST SEMI ***

STABILITY CLASS A

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	1	0	0	0	2	0	3	1	0	1	0	1	0	9
5.51- 6.50	1	0	1	1	2	0	2	1	3	7	3	3	0	1	1	0	26
6.51- 8.50	2	1	1	1	2	4	0	5	16	18	22	12	0	2	0	3	89
8.51-11.50	2	1	2	0	1	3	0	2	9	36	61	30	10	0	4	5	166
11.51-14.50	2	0	3	2	2	1	0	0	3	12	63	11	9	8	8	6	130
14.51-20.50	7	0	3	0	3	0	0	0	3	64	18	8	3	4	2	115	
>20.50	0	0	0	0	0	0	0	0	0	7	7	1	0	0	0	0	15
TOTAL	14	2	10	5	10	8	2	10	31	79	221	81	29	14	18	16	550

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	1	0	0	0	0	1	1	0	1	1	0	1	6
4.51- 5.50	0	2	1	1	0	0	0	3	6	4	6	1	2	1	0	0	27
5.51- 6.50	0	2	3	2	1	3	5	3	11	12	10	0	1	3	0	0	56
6.51- 8.50	1	2	3	3	3	1	3	7	13	13	14	10	2	0	0	0	75
8.51-11.50	0	0	1	2	0	2	0	0	2	3	21	5	5	2	1	0	44
11.51-14.50	2	0	0	1	0	0	0	0	0	2	11	5	2	2	3	1	29
14.51-20.50	0	1	1	0	1	0	0	0	0	5	6	2	1	3	0	0	20
>20.50	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
TOTAL	3	7	9	9	6	6	8	13	32	35	68	29	15	10	7	2	259

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	3
3.51- 4.50	1	1	2	0	1	2	1	4	3	3	2	6	0	0	0	0	26
4.51- 5.50	2	2	2	0	3	2	1	0	16	9	3	1	3	3	1	2	50
5.51- 6.50	1	3	9	2	2	1	2	0	14	10	10	6	1	1	1	3	66
6.51- 8.50	0	3	5	0	1	1	2	2	2	7	7	5	7	2	2	1	47
8.51-11.50	1	1	1	4	2	1	0	0	1	5	7	4	2	0	1	0	30
11.51-14.50	0	0	1	0	0	0	0	0	0	7	0	0	0	2	2	1	13
14.51-20.50	1	0	0	1	1	0	0	0	0	2	4	2	0	2	1	0	14
>20.50	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
TOTAL	6	10	20	8	10	7	6	6	36	36	41	25	15	10	8	7	251

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2011 TO 6/30/2011

*** 1ST SEMI ***

STABILITY CLASS D
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1.51- 2.50	3	2	1	0	3	3	5	1	4	6	2	5	4	4	4	1	48
2.51- 3.50	5	4	6	7	6	5	7	6	18	16	18	17	10	4	5	9	143
3.51- 4.50	3	9	13	5	4	3	4	1	19	31	25	10	9	3	4	7	150
4.51- 5.50	1	4	8	2	3	6	2	5	15	15	19	6	4	1	2	3	96
5.51- 6.50	0	6	6	2	2	4	0	3	8	6	5	7	4	1	1	2	57
6.51- 8.50	1	3	3	2	2	0	3	1	5	8	17	7	7	0	3	2	64
8.51-11.50	2	1	3	2	3	0	4	4	2	7	24	9	5	4	0	1	71
11.51-14.50	3	2	1	1	2	0	0	2	2	6	17	5	1	6	4	3	55
14.51-20.50	0	0	0	0	2	0	0	0	1	7	14	7	6	6	3	0	46
>20.50	0	0	0	0	0	0	0	0	0	1	1	3	2	0	0	0	7
TOTAL	18	31	41	21	27	21	25	23	74	103	143	76	52	29	26	28	738

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
1.51- 2.50	2	4	1	3	0	2	1	2	2	1	5	4	5	5	5	2	44
2.51- 3.50	3	2	3	2	2	1	0	1	4	2	8	9	9	1	3	5	55
3.51- 4.50	4	4	2	3	1	1	1	0	5	3	12	6	2	3	3	2	52
4.51- 5.50	3	4	3	0	0	0	0	0	3	8	10	5	3	3	2	2	46
5.51- 6.50	0	3	1	1	0	0	0	2	4	9	15	4	5	4	1	0	49
6.51- 8.50	2	3	0	2	0	1	0	0	2	22	33	22	10	5	4	4	110
8.51-11.50	0	1	2	0	3	0	2	4	5	28	56	40	18	9	6	4	178
11.51-14.50	3	0	2	1	2	0	0	1	3	15	40	10	10	9	5	3	104
14.51-20.50	1	0	1	0	0	1	0	0	2	3	23	9	4	4	3	8	59
>20.50	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	3
TOTAL	18	21	15	12	8	6	4	10	30	92	202	110	66	43	32	32	701

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1.51- 2.50	2	2	4	0	1	0	0	2	1	1	3	4	6	4	10	6	46
2.51- 3.50	13	5	1	2	1	0	2	2	3	4	4	11	12	21	14	10	105
3.51- 4.50	13	7	3	1	0	0	0	0	0	8	9	16	10	8	10	10	95
4.51- 5.50	6	5	0	1	1	0	0	2	1	5	11	13	9	4	8	9	75
5.51- 6.50	3	2	1	0	0	0	0	0	1	11	21	14	8	7	8	7	83
6.51- 8.50	7	5	0	0	0	1	0	0	5	19	41	33	8	8	9	11	147
8.51-11.50	5	7	0	0	0	0	0	1	0	12	43	12	2	3	6	7	98
11.51-14.50	0	4	0	0	0	0	0	0	1	1	4	0	0	0	0	4	14
14.51-20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	49	37	9	4	3	1	2	7	12	61	138	103	55	55	65	64	665

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2011 TO 6/30/2011

*** 1ST SEMI ***

STABILITY CLASS G

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3
1.51- 2.50	7	5	2	1	1	3	2	2	0	4	3	2	9	11	12	11	75
2.51- 3.50	48	29	7	1	2	1	3	1	2	1	4	11	14	26	35	43	228
3.51- 4.50	100	38	14	3	2	0	0	0	0	4	6	10	6	18	38	76	315
4.51- 5.50	101	43	10	4	1	0	0	0	0	0	3	2	6	4	14	40	228
5.51- 6.50	35	26	4	0	0	0	0	0	0	1	1	3	3	2	4	16	95
6.51- 8.50	41	32	4	0	0	0	0	0	0	0	3	5	2	1	2	18	108
8.51-11.50	15	23	1	0	0	0	0	0	0	1	4	0	0	0	0	5	49
11.51-14.50	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	347	197	42	9	6	4	5	3	2	11	24	33	42	62	106	209	1102

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	1	2	0	2	0	1	0	6
1.51- 2.50	14	13	8	4	5	8	8	7	7	12	13	15	24	24	31	20	213
2.51- 3.50	69	40	17	13	11	7	12	10	27	23	34	49	46	52	57	67	534
3.51- 4.50	121	59	34	12	9	6	6	5	27	50	55	48	28	33	55	96	644
4.51- 5.50	113	60	24	9	8	8	3	12	41	44	53	28	28	16	28	56	531
5.51- 6.50	40	42	25	8	7	8	9	9	41	56	65	37	22	19	16	28	432
6.51- 8.50	54	49	16	8	8	8	8	15	43	87	137	94	36	18	20	39	640
8.51-11.50	25	34	10	8	9	6	6	11	19	92	216	100	42	18	18	22	636
11.51-14.50	10	7	7	5	6	1	0	3	9	36	142	31	22	27	22	18	346
14.51-20.50	9	1	5	1	7	1	0	0	3	15	111	42	20	16	14	10	255
>20.50	0	0	0	0	0	0	0	0	0	1	9	13	4	0	0	2	29
TOTAL	455	305	146	68	70	53	52	72	217	417	837	457	274	223	262	358	4266

TOTAL NUMBER OF OBSERVATIONS: 4344
 TOTAL NUMBER OF VALID OBSERVATIONS: 4266
 TOTAL NUMBER OF MISSING OBSERVATIONS: 78
 PERCENT DATA RECOVERY FOR THIS PERIOD: 98.2 %
 MEAN WIND SPEED FOR THIS PERIOD: 7.1 MPH
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
12.89	6.07	5.88	17.30	16.43	15.59	25.83

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	14	2	10	5	10	8	2	10	31	79	221	81	29	14	18	16	0
B	3	7	9	9	6	6	8	13	32	35	68	29	15	10	7	2	0
C	6	10	20	8	10	7	6	6	36	36	41	25	15	10	8	7	0
D	18	31	41	21	27	21	25	23	74	103	143	76	52	29	26	28	0
E	18	21	15	12	8	6	4	10	30	92	202	110	66	43	32	32	0
F	49	37	9	4	3	1	2	7	12	61	138	103	55	55	65	64	0
G	347	197	42	9	6	4	5	3	2	11	24	33	42	62	106	209	0
TOTAL	455	305	146	68	70	53	52	72	217	417	837	457	274	223	262	358	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2011 TO 9/30/2011

*** 3RD QRTR ***

STABILITY CLASS A
STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5.51- 6.50	0	0	1	3	1	1	2	4	7	5	4	4	0	0	0	0	32
6.51- 8.50	0	0	0	0	5	4	5	10	16	23	49	14	2	1	1	0	130
8.51-11.50	0	0	0	1	3	6	6	2	7	14	38	46	12	1	0	0	136
11.51-14.50	0	0	0	0	1	1	2	0	0	1	9	10	4	1	0	0	29
14.51-20.50	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	1	4	10	13	15	16	30	43	103	74	18	3	1	0	331

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	1	0	0	2	1	0	0	0	0	0	0	0	4
4.51- 5.50	0	1	1	1	0	2	1	3	2	2	3	2	0	1	0	1	20
5.51- 6.50	0	0	1	1	0	0	1	4	23	15	11	4	1	1	0	0	62
6.51- 8.50	0	2	0	3	2	3	2	9	15	19	20	12	8	1	1	0	97
8.51-11.50	0	0	0	0	5	3	0	1	1	4	13	11	5	4	0	0	47
11.51-14.50	0	0	0	0	0	1	0	0	1	1	3	0	1	0	0	0	7
14.51-20.50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	3	2	5	8	10	4	19	43	41	50	29	15	7	1	1	238

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	1	0	2	2	4	2	1	0	0	0	0	12
4.51- 5.50	0	0	5	2	0	1	1	4	10	13	11	4	3	0	0	1	55
5.51- 6.50	0	1	0	0	0	0	1	1	10	8	10	5	1	1	0	0	38
6.51- 8.50	0	1	2	1	1	1	1	1	2	4	5	7	3	1	0	0	30
8.51-11.50	0	1	0	0	1	2	0	0	0	1	1	9	1	0	0	0	16
11.51-14.50	0	0	0	0	3	0	0	0	0	0	1	1	1	0	1	0	7
14.51-20.50	0	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	6
>20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL	0	3	7	3	8	5	3	8	24	31	33	27	9	2	1	1	165

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2011 TO 9/30/2011

*** 3RD QTR ***

STABILITY CLASS D
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	1	1	0	0	0	1	1	0	1	0	2	1	0	2	0	2	12
2.51- 3.50	0	4	3	3	0	0	0	3	4	4	4	7	3	2	2	2	41
3.51- 4.50	1	2	1	1	0	0	1	4	5	4	7	6	3	4	2	1	42
4.51- 5.50	2	2	2	1	0	0	2	1	7	5	6	4	3	1	0	1	37
5.51- 6.50	0	0	1	1	0	0	1	1	6	5	8	7	2	0	1	0	33
6.51- 8.50	0	1	3	1	2	1	1	0	3	6	10	13	4	0	0	1	46
8.51-11.50	1	3	2	5	8	1	4	1	2	4	16	23	12	2	1	0	85
11.51-14.50	2	1	2	2	5	3	0	0	3	2	22	2	1	4	1	0	50
14.51-20.50	0	0	0	1	14	4	2	2	1	3	15	5	1	1	2	3	54
>20.50	0	0	0	0	8	0	0	1	0	2	1	0	0	0	0	1	13
TOTAL	7	14	14	15	37	10	12	13	32	35	91	68	29	16	9	11	413

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	1	2	0	0	0	1	0	1	0	0	0	3	0	2	3	0	13
2.51- 3.50	4	2	2	1	0	0	0	0	0	3	4	3	1	6	4	2	32
3.51- 4.50	3	4	1	1	0	0	0	0	2	1	4	5	8	3	3	1	36
4.51- 5.50	4	3	2	0	0	2	2	4	4	5	15	5	4	1	1	2	54
5.51- 6.50	5	3	3	0	2	0	0	2	4	5	16	7	4	2	0	1	54
6.51- 8.50	1	2	4	3	2	3	0	4	11	10	26	21	9	3	6	0	105
8.51-11.50	4	0	2	5	1	3	7	3	6	15	48	33	5	1	3	2	138
11.51-14.50	1	0	3	4	11	3	5	0	1	4	19	10	1	1	1	2	66
14.51-20.50	1	1	0	1	13	1	1	0	0	0	1	2	1	0	2	0	24
>20.50	0	0	0	0	3	0	0	0	0	1	0	0	1	0	0	0	5
TOTAL	24	17	17	15	32	13	15	14	28	44	133	89	34	19	23	10	527

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	2	0	1	1	0	0	0	0	0	0	1	1	2	2	3	2	15
2.51- 3.50	5	1	1	0	1	0	2	0	2	2	5	8	4	6	4	4	43
3.51- 4.50	8	3	2	3	0	0	1	0	1	1	1	5	4	4	8	6	47
4.51- 5.50	6	6	1	0	2	0	0	3	1	3	8	2	1	5	3	6	47
5.51- 6.50	1	1	0	0	0	0	1	0	2	4	4	4	4	4	1	3	29
6.51- 8.50	1	2	3	0	1	0	0	1	2	8	14	6	8	2	2	3	53
8.51-11.50	0	0	1	0	1	0	0	0	0	4	5	2	2	0	0	0	15
11.51-14.50	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2
14.51-20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	23	13	9	4	5	0	5	4	8	23	36	25	29	21	23	24	252

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2011 TO 9/30/2011

*** 3RD QRTR ***

STABILITY CLASS G
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	3	0	0	0	0	1	0	0	0	0	1	1	1	6	5	4	22
2.51- 3.50	15	1	3	3	0	0	0	1	1	1	0	4	4	10	7	13	63
3.51- 4.50	26	4	5	1	0	0	0	0	2	2	1	2	3	3	11	20	80
4.51- 5.50	20	12	2	0	0	0	0	0	0	0	2	1	0	1	5	11	54
5.51- 6.50	14	10	6	0	0	0	0	0	0	0	1	1	0	2	0	5	39
6.51- 8.50	9	9	1	0	0	1	0	0	0	0	1	1	0	0	0	2	24
8.51-11.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.51-14.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	87	36	17	4	0	2	0	1	3	3	6	10	8	22	28	55	282

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	7	3	1	1	0	3	1	1	1	0	4	6	3	12	11	8	62
2.51- 3.50	24	8	9	7	1	0	2	4	7	10	10	19	16	22	19	21	179
3.51- 4.50	38	13	9	6	1	1	2	8	13	12	15	19	18	14	24	28	221
4.51- 5.50	32	24	13	4	2	6	6	15	24	28	45	18	11	9	9	22	268
5.51- 6.50	20	15	12	5	3	1	6	12	52	42	54	32	12	10	2	9	287
6.51- 8.50	11	17	13	8	13	13	9	25	49	70	125	74	34	8	10	6	485
8.51-11.50	5	4	5	11	19	15	17	7	16	42	121	124	37	8	4	2	437
11.51-14.50	3	1	5	6	20	8	8	0	5	9	54	23	8	6	3	2	161
14.51-20.50	1	1	0	2	30	6	3	2	1	3	23	7	2	1	4	3	89
>20.50	0	0	0	0	11	0	0	1	0	4	1	0	1	0	0	1	19
TOTAL	141	86	67	50	100	53	54	75	168	220	452	322	142	90	86	102	2208

TOTAL NUMBER OF OBSERVATIONS: 2208
 TOTAL NUMBER OF VALID OBSERVATIONS: 2208
 TOTAL NUMBER OF MISSING OBSERVATIONS: 0
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %
 MEAN WIND SPEED FOR THIS PERIOD: 7.5 MPH
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES
 A 14.99 B 10.78 C 7.47 D 18.70 E 23.87 F 11.41 G 12.77

	DISTRIBUTION OF WIND DIRECTION VS STABILITY																CALM
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
A	0	0	1	4	10	13	15	16	30	43	103	74	18	3	1	0	0
B	0	3	2	5	8	10	4	19	43	41	50	29	15	7	1	1	0
C	0	3	7	3	8	5	3	8	24	31	33	27	9	2	1	1	0
D	7	14	14	15	37	10	12	13	32	35	91	68	29	16	9	11	0
E	24	17	17	15	32	13	15	14	28	44	133	89	34	19	23	10	0
F	23	13	9	4	5	0	5	4	8	23	36	25	29	21	23	24	0
G	87	36	17	4	0	2	0	1	3	3	6	10	8	22	28	55	0
TOTAL	141	86	67	50	100	53	54	75	168	220	452	322	142	90	86	102	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2011 TO 12/31/2011

*** 4TH QTR ***

STABILITY CLASS A

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.51- 6.50	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	3
6.51- 8.50	0	0	1	4	7	1	2	0	2	0	0	0	0	1	0	0	18
8.51-11.50	0	0	0	1	6	0	0	0	1	3	1	1	1	3	0	0	17
11.51-14.50	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	3
14.51-20.50	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	4
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	1	6	13	1	3	0	4	5	4	2	2	4	0	0	45

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	3
4.51- 5.50	0	1	2	1	1	0	1	0	0	0	0	0	0	0	0	0	6
5.51- 6.50	0	0	2	3	0	2	1	1	1	1	1	1	0	0	0	0	13
6.51- 8.50	2	1	0	7	0	3	1	1	1	0	1	1	0	2	0	0	20
8.51-11.50	0	0	0	5	5	2	0	0	1	1	4	2	2	1	1	0	24
11.51-14.50	0	0	0	1	1	0	0	0	0	0	4	0	0	2	0	0	8
14.51-20.50	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	2
>20.50	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
TOTAL	2	2	4	18	8	7	3	2	4	3	11	4	3	5	1	1	78

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
3.51- 4.50	0	1	0	2	0	0	1	2	0	1	1	0	1	0	1	0	10
4.51- 5.50	0	0	3	5	2	2	1	1	3	1	2	2	0	0	0	1	23
5.51- 6.50	0	0	6	7	0	0	0	2	3	1	8	3	2	0	0	0	32
6.51- 8.50	2	3	6	5	1	1	0	1	4	3	4	1	2	0	0	0	33
8.51-11.50	0	0	1	0	0	0	0	0	2	2	3	2	2	1	3	0	16
11.51-14.50	0	0	0	1	0	0	0	0	2	0	1	0	1	0	0	4	9
14.51-20.50	0	0	0	0	2	0	0	0	0	0	1	0	0	1	0	1	5
>20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
TOTAL	2	4	16	20	5	3	2	6	14	9	20	8	8	3	6	6	132

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2011 TO 12/31/2011

*** 4TH QRTR ***

STABILITY CLASS D

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	3	1	2	2	1	0	2	0	3	2	3	2	2	2	4	1	30
2.51- 3.50	5	3	2	6	5	4	1	5	12	8	13	11	10	4	3	8	100
3.51- 4.50	5	5	10	8	3	2	4	3	13	13	12	11	0	8	4	5	106
4.51- 5.50	3	5	13	1	2	0	1	2	7	7	2	1	3	2	5	4	58
5.51- 6.50	1	4	2	5	0	0	0	3	6	7	6	4	0	0	3	1	42
6.51- 8.50	0	3	6	2	2	0	1	1	0	7	11	7	8	1	0	0	49
8.51-11.50	0	1	3	6	1	1	1	0	1	5	6	2	1	3	2	2	35
11.51-14.50	0	1	0	0	6	0	0	2	1	3	8	1	1	1	5	0	29
14.51-20.50	0	0	0	3	5	0	0	0	0	3	1	2	1	0	2	1	18
>20.50	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	4
TOTAL	17	23	38	33	25	7	10	16	43	58	62	41	26	22	28	22	471

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	4
1.51- 2.50	4	1	0	0	0	0	0	1	1	1	7	3	2	4	5	2	31
2.51- 3.50	4	3	4	0	2	0	0	1	2	5	6	1	6	6	8	2	50
3.51- 4.50	3	4	1	0	3	0	0	1	5	9	2	2	4	5	4	8	51
4.51- 5.50	1	0	2	0	0	0	1	1	6	2	8	4	2	2	5	2	36
5.51- 6.50	3	4	0	1	0	0	1	0	3	3	3	5	1	3	1	0	28
6.51- 8.50	1	2	6	3	1	4	0	3	4	10	11	1	1	3	0	0	50
8.51-11.50	0	0	3	1	1	4	1	2	3	7	5	3	2	6	5	0	43
11.51-14.50	0	0	1	0	4	4	3	0	0	4	1	1	0	1	1	1	21
14.51-20.50	0	0	0	0	8	0	1	0	1	1	0	1	1	1	2	4	20
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TOTAL	17	14	17	5	19	12	7	9	25	42	43	21	20	34	31	19	335

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
1.51- 2.50	0	3	0	1	0	1	0	0	0	2	5	1	3	8	3	2	29
2.51- 3.50	3	5	1	3	3	0	2	0	1	1	3	4	7	7	14	10	64
3.51- 4.50	7	5	1	1	0	1	0	0	1	4	7	9	3	6	9	14	68
4.51- 5.50	7	7	1	0	0	0	0	0	1	1	6	8	2	6	6	11	56
5.51- 6.50	2	3	2	0	0	0	0	0	1	2	10	3	0	1	5	6	35
6.51- 8.50	1	2	5	2	0	0	0	0	1	5	4	2	3	2	2	6	35
8.51-11.50	2	0	3	4	0	0	0	0	1	0	3	0	0	1	0	6	20
11.51-14.50	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	9	10
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	22	25	13	11	3	2	3	0	6	15	38	27	18	32	39	66	320

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2011 TO 12/31/2011

*** 4TH QTR ***

STABILITY CLASS G
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	2
1.51- 2.50	12	10	3	2	0	1	0	2	0	0	2	3	3	8	10	11	67
2.51- 3.50	47	18	8	2	0	2	0	1	0	0	2	3	10	16	35	51	195
3.51- 4.50	61	37	6	2	3	1	0	1	0	2	0	3	6	12	29	47	210
4.51- 5.50	60	44	7	3	0	0	0	0	0	1	0	0	1	2	7	40	165
5.51- 6.50	33	30	5	2	0	0	0	0	1	0	0	0	1	2	4	7	85
6.51- 8.50	27	34	8	0	0	0	0	0	0	0	0	0	0	0	1	14	84
8.51-11.50	4	9	2	0	0	0	0	0	0	0	0	0	0	0	0	4	19
11.51-14.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	244	182	39	11	4	4	0	4	1	3	4	10	21	40	86	174	827

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	0	1	0	0	0	0	0	0	1	1	3	0	0	7
1.51- 2.50	19	15	5	5	1	2	3	4	5	17	9	10	22	22	16	157	
2.51- 3.50	59	29	15	11	10	6	3	7	15	14	24	19	33	33	62	71	411
3.51- 4.50	76	52	18	14	10	4	5	7	19	29	22	25	14	31	47	75	448
4.51- 5.50	71	57	28	10	5	2	4	4	17	12	18	15	8	12	23	58	344
5.51- 6.50	39	41	17	19	0	2	3	6	15	15	28	16	4	6	13	14	238
6.51- 8.50	33	45	32	23	11	9	4	6	12	25	31	12	14	9	3	20	289
8.51-11.50	6	10	12	17	13	7	2	2	9	18	22	10	8	15	11	12	174
11.51-14.50	0	1	1	2	11	4	4	2	4	7	16	2	2	4	6	14	80
14.51-20.50	0	0	0	3	15	0	1	0	1	6	3	4	4	2	4	8	51
>20.50	0	0	0	0	0	0	0	0	1	4	1	0	0	3	0	0	9
TOTAL	304	250	128	104	77	36	28	37	97	135	182	113	98	140	191	288	2208

TOTAL NUMBER OF OBSERVATIONS: 2208
 TOTAL NUMBER OF VALID OBSERVATIONS: 2208
 TOTAL NUMBER OF MISSING OBSERVATIONS: 0
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %
 MEAN WIND SPEED FOR THIS PERIOD: 5.7 MPH
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
2.04	3.53	5.98	21.33	15.17	14.49	37.45

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	0	0	1	6	13	1	3	0	4	5	4	2	2	4	0	0	0
B	2	2	4	18	8	7	3	2	4	3	11	4	3	5	1	1	0
C	2	4	16	20	5	3	2	6	14	9	20	8	8	3	6	0	
D	17	23	38	33	25	7	10	16	43	58	62	41	26	22	28	22	0
E	17	14	17	5	19	12	7	9	25	42	43	21	20	34	31	19	0
F	22	25	13	11	3	2	3	0	6	15	38	27	18	32	39	66	0
G	244	182	39	11	4	4	0	4	1	3	4	10	21	40	86	174	0
TOTAL	304	250	128	104	77	36	28	37	97	135	182	113	98	140	191	288	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2011 TO 12/31/2011

*** 2ND SEMI ***

STABILITY CLASS A
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5.51- 6.50	0	0	1	4	1	1	3	4	7	6	4	4	0	0	0	0	35
6.51- 8.50	0	0	1	4	12	5	7	10	18	23	49	14	2	2	1	0	148
8.51-11.50	0	0	0	2	9	6	6	2	8	17	39	47	13	4	0	0	153
11.51-14.50	0	0	0	0	1	1	2	0	1	1	11	10	4	1	0	0	32
14.51-20.50	0	0	0	0	0	0	0	0	0	1	4	1	1	0	0	0	7
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	2	10	23	14	18	16	34	48	107	76	20	7	1	0	376

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	1	2	0	0	2	1	0	0	0	0	0	0	1	7
4.51- 5.50	0	2	3	2	1	2	2	3	2	2	3	2	0	1	0	1	26
5.51- 6.50	0	0	3	4	0	2	2	5	24	16	12	5	1	1	0	0	75
6.51- 8.50	2	3	0	10	2	6	3	10	16	19	21	13	8	3	1	0	117
8.51-11.50	0	0	0	5	10	5	0	1	2	5	17	13	7	5	1	0	71
11.51-14.50	0	0	0	1	1	1	0	0	1	1	7	0	1	2	0	0	15
14.51-20.50	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	3
>20.50	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
TOTAL	2	5	6	23	16	17	7	21	47	44	61	33	18	12	2	2	316

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
3.51- 4.50	0	1	0	2	0	1	1	4	2	5	3	1	1	0	1	0	22
4.51- 5.50	0	0	8	7	2	3	2	5	13	14	13	6	3	0	0	2	78
5.51- 6.50	0	1	6	7	0	0	1	3	13	9	18	8	3	1	0	0	70
6.51- 8.50	2	4	8	6	2	2	1	2	6	7	9	8	5	1	0	0	63
8.51-11.50	0	1	1	0	1	2	0	0	2	3	4	11	3	1	3	0	32
11.51-14.50	0	0	0	1	3	0	0	0	2	0	2	1	2	0	1	4	16
14.51-20.50	0	0	0	0	5	0	0	0	0	0	4	0	0	1	0	1	11
>20.50	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	3
TOTAL	2	7	23	23	13	8	5	14	38	40	53	35	17	5	7	7	297

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2011 TO 12/31/2011

*** 2ND SEMI ***

STABILITY CLASS D

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	4	2	2	2	1	1	3	0	4	2	5	3	2	4	4	3	42
2.51- 3.50	5	7	5	9	5	4	1	8	16	12	17	18	13	6	5	10	141
3.51- 4.50	6	7	11	9	3	2	5	7	18	17	19	17	3	12	6	6	148
4.51- 5.50	5	7	15	2	2	0	3	3	14	12	8	5	6	3	5	5	95
5.51- 6.50	1	4	3	6	0	0	1	4	12	12	14	11	2	0	4	1	75
6.51- 8.50	0	4	9	3	4	1	2	1	3	13	21	20	12	1	0	1	95
8.51-11.50	1	4	5	11	9	2	5	1	3	9	22	25	13	5	3	2	120
11.51-14.50	2	2	2	2	11	3	0	2	4	5	30	3	2	5	6	0	79
14.51-20.50	0	0	0	4	19	4	2	2	1	6	16	7	2	1	4	4	72
>20.50	0	0	0	0	8	0	0	1	0	5	1	0	0	1	4	1	17
TOTAL	24	37	52	48	62	17	22	29	75	93	153	109	55	38	37	33	884

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	4
1.51- 2.50	5	3	0	0	0	1	0	2	1	1	7	6	2	6	8	2	44
2.51- 3.50	8	5	6	1	2	0	0	1	2	8	10	4	7	12	12	4	82
3.51- 4.50	6	8	2	1	3	0	0	1	7	10	6	7	12	8	7	9	87
4.51- 5.50	5	3	4	0	0	2	3	5	10	7	23	9	6	3	6	4	90
5.51- 6.50	8	7	3	1	2	0	1	2	7	8	19	12	5	5	1	1	82
6.51- 8.50	2	4	10	6	3	7	0	7	15	20	37	22	10	6	6	0	155
8.51-11.50	4	0	5	6	2	7	8	5	9	22	53	36	7	7	8	2	181
11.51-14.50	1	0	4	4	15	7	8	0	1	8	20	11	1	2	2	3	87
14.51-20.50	1	1	0	1	21	1	2	0	1	1	3	2	1	4	4	4	44
>20.50	0	0	0	0	3	0	0	0	0	1	0	0	1	1	0	0	6
TOTAL	41	31	34	20	51	25	22	23	53	86	176	110	54	53	54	29	862

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
1.51- 2.50	2	3	1	2	0	1	0	0	0	2	6	2	5	10	6	4	44
2.51- 3.50	8	6	2	3	4	0	4	0	3	3	5	9	15	11	20	14	107
3.51- 4.50	15	8	3	4	0	1	1	0	2	5	8	14	7	10	17	20	115
4.51- 5.50	13	13	2	0	2	0	0	3	2	4	14	10	3	11	9	17	103
5.51- 6.50	3	4	2	0	0	0	1	0	3	6	14	7	4	5	6	9	64
6.51- 8.50	2	4	8	2	1	0	0	1	3	13	18	8	11	4	4	9	88
8.51-11.50	2	0	4	4	1	0	0	0	1	4	8	2	2	1	0	6	35
11.51-14.50	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	9	12
14.51-20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	3
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	45	38	22	15	8	2	8	4	14	38	74	52	47	53	62	90	572

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2011 TO 12/31/2011

*** 2ND SEMI ***

STABILITY CLASS G
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	2
1.51- 2.50	15	10	3	2	0	2	0	2	0	0	3	4	4	14	15	15	89
2.51- 3.50	62	19	11	5	0	2	0	2	1	1	2	7	14	26	42	64	258
3.51- 4.50	87	41	11	3	3	1	0	1	2	4	1	5	9	15	40	67	290
4.51- 5.50	80	56	9	3	0	0	0	0	0	1	2	1	1	3	12	51	219
5.51- 6.50	47	40	11	2	0	0	0	0	1	0	1	1	1	4	4	12	124
6.51- 8.50	36	43	9	0	0	1	0	0	0	0	1	1	0	0	1	16	108
8.51-11.50	4	9	2	0	0	0	0	0	0	0	0	0	0	0	0	4	19
11.51-14.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	331	218	56	15	4	6	0	5	4	6	10	20	29	62	114	229	1109

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	0	1	0	0	0	0	0	0	1	1	3	0	0	7
1.51- 2.50	26	18	6	6	1	5	3	4	5	5	21	15	13	34	33	24	219
2.51- 3.50	83	37	24	18	11	6	5	11	22	24	34	38	49	55	81	92	590
3.51- 4.50	114	65	27	20	11	5	7	15	32	41	37	44	32	45	71	103	669
4.51- 5.50	103	81	41	14	7	8	10	19	41	40	63	33	19	21	32	80	612
5.51- 6.50	59	56	29	24	3	3	9	18	67	57	82	48	16	16	15	23	525
6.51- 8.50	44	62	45	31	24	22	13	31	61	95	156	86	48	17	13	26	774
8.51-11.50	11	14	17	28	32	22	19	9	25	60	143	134	45	23	15	14	611
11.51-14.50	3	2	6	8	31	12	12	2	9	16	70	25	10	10	9	16	241
14.51-20.50	1	1	0	5	45	6	4	2	2	9	26	11	6	3	8	11	140
>20.50	0	0	0	0	11	0	0	1	1	8	2	0	1	3	0	1	28
TOTAL	445	336	195	154	177	89	82	112	265	355	634	435	240	230	277	390	4416

TOTAL NUMBER OF OBSERVATIONS: 4416
 TOTAL NUMBER OF VALID OBSERVATIONS: 4416
 TOTAL NUMBER OF MISSING OBSERVATIONS: 0
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %
 MEAN WIND SPEED FOR THIS PERIOD: 6.6 MPH
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES
 A 8.51 B 7.16 C 6.73 D 20.02 E 19.52 F 12.95 G 25.11

	DISTRIBUTION OF WIND DIRECTION VS STABILITY																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	0	0	2	10	23	14	18	16	34	48	107	76	20	7	1	0	0
B	2	5	6	23	16	17	7	21	47	44	61	33	18	12	2	2	0
C	2	7	23	23	13	8	5	14	38	40	53	35	17	5	7	7	0
D	24	37	52	48	62	17	22	29	75	93	153	109	55	38	37	33	0
E	41	31	34	20	51	25	22	23	53	86	176	110	54	53	54	29	0
F	45	38	22	15	8	2	8	4	14	38	74	52	47	53	62	90	0
G	331	218	56	15	4	6	0	5	4	6	10	20	29	62	114	229	0
TOTAL	445	336	195	154	177	89	82	112	265	355	634	435	240	230	277	390	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2011 TO 12/31/2011

*** ANNUAL ***

STABILITY CLASS A
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	1	0	1	0	2	0	3	1	0	1	0	1	0	10
5.51- 6.50	1	0	2	5	3	1	5	5	10	13	7	7	0	1	1	0	61
6.51- 8.50	2	1	2	5	14	9	7	15	34	41	71	26	2	4	1	3	237
8.51-11.50	2	1	2	2	10	9	6	4	17	53	100	77	23	4	4	5	319
11.51-14.50	2	0	3	2	3	2	2	0	4	13	74	21	13	9	8	6	162
14.51-20.50	7	0	3	0	3	0	0	0	0	4	68	19	9	3	4	2	122
>20.50	0	0	0	0	0	0	0	0	0	0	7	7	1	0	0	0	15
TOTAL	14	2	12	15	33	22	20	26	65	127	328	157	49	21	19	16	926

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	1	3	0	0	2	1	1	1	0	1	1	0	2	13
4.51- 5.50	0	4	4	3	1	2	2	6	8	6	9	3	2	2	0	1	53
5.51- 6.50	0	2	6	6	1	5	7	8	35	28	22	5	2	4	0	0	131
6.51- 8.50	3	5	3	13	5	7	6	17	29	32	35	23	10	3	1	0	192
8.51-11.50	0	0	1	7	10	7	0	1	4	8	38	18	12	7	2	0	115
11.51-14.50	2	0	0	2	1	1	0	0	1	3	18	5	3	4	3	1	44
14.51-20.50	0	1	1	0	1	1	0	0	0	1	5	6	3	1	3	0	23
>20.50	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	4
TOTAL	5	12	15	32	22	23	15	34	79	79	129	62	33	22	9	4	575

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	1	0	0	0	0	0	0	0	1	1	0	2	0	5
3.51- 4.50	1	2	2	2	1	3	2	8	5	8	5	7	1	0	1	0	48
4.51- 5.50	2	2	10	7	5	5	3	5	29	23	16	7	6	3	1	4	128
5.51- 6.50	1	4	15	9	2	1	3	3	27	19	28	14	4	2	1	3	136
6.51- 8.50	2	7	13	6	3	3	3	4	8	14	16	13	12	3	2	1	110
8.51-11.50	1	2	2	4	3	3	0	0	3	8	11	15	5	1	4	0	62
11.51-14.50	0	0	1	1	3	0	0	0	2	0	9	1	2	2	3	5	29
14.51-20.50	1	0	0	1	6	0	0	0	0	2	8	2	0	3	1	1	25
>20.50	0	0	0	0	0	0	0	0	0	2	1	0	1	1	0	0	5
TOTAL	8	17	43	31	23	15	11	20	74	76	94	60	32	15	15	14	548

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2011 TO 12/31/2011

*** ANNUAL ***

STABILITY CLASS D
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1.51- 2.50	7	4	3	2	4	4	8	1	8	8	7	8	6	8	8	4	90
2.51- 3.50	10	11	11	16	11	9	8	14	34	28	35	35	23	10	10	19	284
3.51- 4.50	9	16	24	14	7	5	9	8	37	48	44	27	12	15	10	13	298
4.51- 5.50	6	11	23	4	5	6	5	8	29	27	27	11	10	4	7	8	191
5.51- 6.50	1	10	9	8	2	4	1	7	20	18	19	18	6	1	5	3	132
6.51- 8.50	1	7	12	5	6	1	5	2	8	21	38	27	19	1	3	3	159
8.51-11.50	3	5	8	13	12	2	9	5	5	16	46	34	18	9	3	3	191
11.51-14.50	5	4	3	3	13	3	0	4	6	11	47	8	3	11	10	3	134
14.51-20.50	0	0	0	4	21	4	2	2	2	13	30	14	8	7	7	4	118
>20.50	0	0	0	0	8	0	0	1	0	6	2	3	2	1	0	1	24
TOTAL	42	68	93	69	89	38	47	52	149	196	296	185	107	67	63	61	1622

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	5
1.51- 2.50	7	7	1	3	0	3	1	4	3	2	12	10	7	11	13	4	88
2.51- 3.50	11	7	9	3	4	1	0	2	6	10	18	13	16	13	15	9	137
3.51- 4.50	10	12	4	4	4	1	1	1	12	13	18	13	14	11	10	11	139
4.51- 5.50	8	7	7	0	0	2	3	5	13	15	33	14	9	6	8	6	136
5.51- 6.50	8	10	4	2	2	0	1	4	11	17	34	16	10	9	2	1	131
6.51- 8.50	4	7	10	8	3	8	0	7	17	42	70	44	20	11	10	4	265
8.51-11.50	4	1	7	6	5	7	10	9	14	50	109	76	25	16	14	6	359
11.51-14.50	4	0	6	5	17	7	8	1	4	23	60	21	11	11	7	6	191
14.51-20.50	2	1	1	1	21	2	2	0	3	4	24	12	6	5	7	12	103
>20.50	0	0	0	0	3	0	0	0	0	1	0	1	1	1	0	2	9
TOTAL	59	52	49	32	59	31	26	33	83	178	378	220	120	96	86	61	1563

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
1.51- 2.50	4	5	5	2	1	1	0	2	1	3	9	6	11	14	16	10	90
2.51- 3.50	21	11	3	5	5	0	6	2	6	7	9	20	27	32	34	24	212
3.51- 4.50	28	15	6	5	0	1	1	0	2	13	17	30	17	18	27	30	210
4.51- 5.50	19	18	2	1	3	0	0	5	3	9	25	23	12	15	17	26	178
5.51- 6.50	6	6	3	0	0	0	1	0	4	17	35	21	12	12	14	16	147
6.51- 8.50	9	9	8	2	1	1	0	1	8	32	59	41	19	12	13	20	235
8.51-11.50	7	7	4	4	1	0	0	1	1	16	51	14	4	4	6	13	133
11.51-14.50	0	4	0	0	0	0	2	0	1	2	4	0	0	0	0	13	26
14.51-20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	4
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	94	75	31	19	11	3	10	11	26	99	212	155	102	108	127	154	1237

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2011 TO 12/31/2011

*** ANNUAL ***

STABILITY CLASS G

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
 WIND MEASURED AT: 35.0 FEET
 WIND THRESHOLD AT: .75 MPH
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	1	0	0	0	0	0	0	1	2	0	1	0	0
.76- 1.50	0	0	0	0	1	0	0	0	0	0	0	1	2	0	1	0	5
1.51- 2.50	22	15	5	3	1	5	2	4	0	4	6	6	13	25	27	26	164
2.51- 3.50	110	48	18	6	2	3	3	3	3	2	6	18	28	52	77	107	486
3.51- 4.50	187	79	25	6	5	1	0	1	2	8	7	15	15	33	78	143	605
4.51- 5.50	181	99	19	7	1	0	0	0	0	1	5	3	7	7	26	91	447
5.51- 6.50	82	66	15	2	0	0	0	0	1	1	2	4	4	6	8	28	219
6.51- 8.50	77	75	13	0	0	1	0	0	0	0	4	6	2	1	3	34	216
8.51-11.50	19	32	3	0	0	0	0	0	1	4	0	0	0	0	0	9	68
11.51-14.50	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	678	415	98	24	10	10	5	8	6	17	34	53	71	124	220	438	2211

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	1	0	0	0	0	1	2	1	3	3	1	0	0
.76- 1.50	1	0	0	0	1	0	0	0	0	1	2	1	3	3	1	0	13
1.51- 2.50	40	31	14	10	6	13	11	11	12	17	34	30	37	58	64	44	432
2.51- 3.50	152	77	41	31	22	13	17	21	49	47	68	87	95	107	138	159	1124
3.51- 4.50	235	124	61	32	20	11	13	20	59	91	92	92	60	78	126	199	1313
4.51- 5.50	216	141	65	23	15	16	13	31	82	84	116	61	47	37	60	136	1143
5.51- 6.50	99	98	54	32	10	11	18	27	108	113	147	85	38	35	31	51	957
6.51- 8.50	98	111	61	39	32	30	21	46	104	182	293	180	84	35	33	65	1414
8.51-11.50	36	48	27	36	41	28	25	20	44	152	359	234	87	41	33	36	1247
11.51-14.50	13	9	13	13	37	13	12	5	18	52	212	56	32	37	31	34	587
14.51-20.50	10	2	5	6	52	7	4	2	5	24	137	53	26	19	22	21	395
>20.50	0	0	0	0	11	0	0	1	1	9	11	13	5	3	0	3	57
TOTAL	900	641	341	222	247	142	134	184	482	772	1471	892	514	453	539	748	8682

TOTAL NUMBER OF OBSERVATIONS: 8760
 TOTAL NUMBER OF VALID OBSERVATIONS: 8682
 TOTAL NUMBER OF MISSING OBSERVATIONS: 78
 PERCENT DATA RECOVERY FOR THIS PERIOD: 99.1 %
 MEAN WIND SPEED FOR THIS PERIOD: 6.9 MPH
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
10.67	6.62	6.31	18.68	18.00	14.25	25.47

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	14	2	12	15	33	22	20	26	65	127	328	157	49	21	19	16	0
B	5	12	15	32	22	23	15	34	79	79	129	62	33	22	9	4	0
C	8	17	43	31	23	15	11	20	74	76	94	60	32	15	15	14	0
D	42	68	93	69	89	38	47	52	149	196	296	185	107	67	63	61	0
E	59	52	49	32	59	31	26	33	83	178	378	220	120	96	86	61	0
F	94	75	31	19	11	3	10	11	26	99	212	155	102	108	127	154	0
G	678	415	98	24	10	10	5	8	6	17	34	53	71	124	220	438	0
TOTAL	900	641	341	222	247	142	134	184	482	772	1471	892	514	453	539	748	0

APPENDIX C
DOSE CALCULATIONS

GASEOUS EFFLUENT DOSE CALCULATIONS

Doses to the maximum individual and the surrounding population resulting from the release of radioactive material in gaseous effluents from the Palo Verde Nuclear Generating Station were calculated using the GASPAR computer program. The radionuclides considered in the dose calculations were Tritium, Iodine-131, Iodine-132, Iodine-133, Iodine-135, all noble gases, and particulates having a half-life greater than eight days and for which dose factors are contained in NUREG-0172. Locations selected for individual dose calculations included for each sector, the site boundary, and within five miles, if present, the nearest residence, the nearest garden, and the nearest milk animal. GASPAR implements the radiological dose models of Regulatory Guide 1.109 to determine the radiation exposure to man from four principal atmospheric exposure pathways: plume, ground deposition, inhalation, and ingestion. Doses to the maximum individual and the population were calculated as a function of age group and pathway for significant body organs.

Table 43 presents the doses on a quarterly, semiannual and annual basis for the Energy Information Center. An occupancy factor of 1.0 (implying continuous occupancy over the entire year) was considered for the Energy Information Center and the exposure pathways considered to calculate its doses were plume, ground deposition, and inhalation.

Table 44 presents the population dose.

Table 45 summarizes the individual doses and compares the result to PVNGS ODCM Requirement limits. The site boundary and residence locations for which data are presented represent the highest annual doses.

Based on results obtained by placing TLDs on the site boundary in each sector, the net dose for this reporting period, from direct-radiation, (plume and ground deposition) from all three units was indistinguishable from preoperational values of 8 - 14 $\mu\text{R/hr}$ (17 - 30 mR/Std Qtr).

There were no liquid effluents associated with the operation of this facility.

Dose Calculation Models

The GASPARG computer code was used to evaluate the radiological consequences of the routine release of gaseous effluents. GASPARG implements the dose calculational methodologies of Regulatory Guide 1.109, Revision 1.

Source terms for each quarter are combined with station-specific demographic data and each quarter's atmospheric diffusion estimates for gaseous dose calculations.

Atmospheric diffusion estimates are generated by the XOQDOQ computer code using onsite meteorological data as input. Additional input to GASPARG includes the following site-specific data:

- 0 to 5 mile nearest residence, milk animal and garden in each of the 16 compass sectors, based on the 2011 Land Use Census.

- 0 to 10 mile population from the PVNGS Emergency Plan, Rev 47.

- The 10 to 50 mile population distribution from the PVNGS UFSAR, Figure 2.1-12.

- The population distribution of metropolitan Phoenix greater than 50 miles from PVNGS, based on the 1980 federal census results, is conservatively included in the 40 to 50 mile sectors (NE=123; ENE=140,097; E=621,130; ESE=8,392).

- Absolute humidity of 6.0 g/m³ from the PVNGS UFSAR, Table 2.3-16.

- The fraction of the year that vegetables are grown (0.667) from the PVNGS ER-OL, Section 2.1.3.4, Table 2.1-8.

- The fraction of daily feed derived from pasture while on pasture (0.35) and length of grazing season for milk animals beyond 5 miles (0.75) from the PVNGS ER-OL, Section 2.1.3.4.3.

- The fraction of daily feed derived from pasture while on pasture (0.05) and length of grazing season for meat animals (0.25) from the PVNGS ER-OL, Section 2.1.3.4.4.

- There were three (3) sectors containing milk animal (goat or cow) locations within five (5) miles. For calculational purposes these milk animals are assumed to be fed 100% on pasture grass during the year.

Other values used for input to GASPARG are default values from Regulatory Guide 1.109, Revision 1.

**Table 43:
Doses To Special Locations For 2011**

ENERGY INFORMATION CENTER LOCATED ONSITE 0.45 MILE S FROM UNIT 1, 0.29 MILE SSE FROM UNIT 2
AND 0.20 MILE ESE FROM UNIT 3

(MREM)	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
1ST QUARTER								
ADULT	6.56E-01	6.56E-01	2.89E-03	6.56E-01	6.56E-01	6.57E-01	6.56E-01	6.58E-01
TEEN	6.59E-01	6.59E-01	2.90E-03	6.59E-01	6.59E-01	6.62E-01	6.59E-01	6.61E-01
CHILD	5.84E-01	5.84E-01	2.90E-03	5.84E-01	5.84E-01	5.85E-01	5.84E-01	5.86E-01
INFANT	3.37E-01	3.37E-01	2.89E-03	3.37E-01	3.37E-01	3.39E-01	3.37E-01	3.39E-01
2ND QUARTER								
ADULT	1.30E-01	1.30E-01	8.43E-03	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.35E-01
TEEN	1.31E-01	1.31E-01	8.43E-03	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.35E-01
CHILD	1.17E-01	1.17E-01	8.43E-03	1.17E-01	1.17E-01	1.17E-01	1.17E-01	1.21E-01
INFANT	7.07E-02	7.07E-02	8.43E-03	7.07E-02	7.07E-02	7.09E-02	7.09E-02	7.51E-02
1ST SEMI-ANNUAL								
ADULT	7.86E-01	7.86E-01	1.13E-02	7.86E-01	7.86E-01	7.88E-01	7.87E-01	7.92E-01
TEEN	7.90E-01	7.90E-01	1.13E-02	7.90E-01	7.90E-01	7.93E-01	7.91E-01	7.97E-01
CHILD	7.01E-01	7.01E-01	1.13E-02	7.01E-01	7.01E-01	7.02E-01	7.01E-01	7.07E-01
INFANT	4.08E-01	4.08E-01	1.13E-02	4.08E-01	4.08E-01	4.10E-01	4.08E-01	4.14E-01
3RD QUARTER								
ADULT	2.77E-01	2.77E-01	8.86E-04	2.77E-01	2.77E-01	2.77E-01	2.77E-01	2.78E-01
TEEN	2.79E-01	2.79E-01	8.86E-04	2.79E-01	2.79E-01	2.79E-01	2.79E-01	2.80E-01
CHILD	2.47E-01	2.47E-01	8.86E-04	2.47E-01	2.47E-01	2.47E-01	2.47E-01	2.48E-01
INFANT	1.42E-01	1.42E-01	8.86E-04	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.43E-01
4TH QUARTER								
ADULT	3.29E-01	3.30E-01	1.97E-03	3.30E-01	3.29E-01	3.30E-01	3.30E-01	3.30E-01
TEEN	3.31E-01	3.31E-01	1.97E-03	3.31E-01	3.31E-01	3.32E-01	3.32E-01	3.32E-01
CHILD	2.93E-01	2.93E-01	1.97E-03	2.93E-01	2.93E-01	2.93E-01	2.93E-01	2.94E-01
INFANT	1.69E-01	1.69E-01	1.97E-03	1.69E-01	1.69E-01	1.70E-01	1.70E-01	8.94E-02
2ND SEMI-ANNUAL								
ADULT	6.06E-01	6.07E-01	2.86E-03	6.07E-01	6.06E-01	6.07E-01	6.07E-01	6.08E-01
TEEN	6.10E-01	6.10E-01	2.86E-03	6.10E-01	6.10E-01	6.11E-01	6.11E-01	6.13E-01
CHILD	5.40E-01	5.40E-01	2.86E-03	5.40E-01	5.40E-01	5.40E-01	5.40E-01	5.42E-01
INFANT	3.11E-01	3.11E-01	2.86E-03	3.11E-01	3.11E-01	3.12E-01	3.12E-01	2.32E-01
ANNUAL								
ADULT	1.39E+00	1.39E+00	1.42E-02	1.39E+00	1.39E+00	1.39E+00	1.39E+00	1.40E+00
TEEN	1.40E+00	1.40E+00	1.42E-02	1.40E+00	1.40E+00	1.40E+00	1.40E+00	1.41E+00
CHILD	1.24E+00	1.24E+00	1.42E-02	1.24E+00	1.24E+00	1.24E+00	1.24E+00	1.25E+00
INFANT	7.19E-01	7.19E-01	1.42E-02	7.19E-01	7.19E-01	7.22E-01	7.19E-01	6.46E-01

**Table 44:
Integrated Population Dose for 2011**

JAN - MAR								
PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	3.10E-04 .00%	3.10E-04 .00%	3.10E-04 73.89%	3.10E-04 .00%	3.10E-04 .00%	3.10E-04 .00%	3.10E-04 .00%	6.32E-04 .01%
GROUND	3.07E-05 .00%	3.07E-05 .00%	3.07E-05 7.31%	3.07E-05 .00%	3.07E-05 .00%	3.07E-05 .00%	3.07E-05 .00%	3.59E-05 .00%
INHAL	2.84E+00 29.92%	2.84E+00 29.92%	2.33E-05 5.55%	2.84E+00 29.92%	2.84E+00 29.92%	2.85E+00 29.95%	2.84E+00 29.92%	2.84E+00 29.92%
VEGET	5.62E+00 59.08%	5.62E+00 59.08%	4.87E-05 11.60%	5.62E+00 59.08%	5.62E+00 59.08%	5.62E+00 59.07%	5.62E+00 59.08%	5.62E+00 59.08%
COW MILK	7.89E-01 8.30%	7.89E-01 8.30%	6.61E-06 1.57%	7.89E-01 8.30%	7.89E-01 8.30%	7.89E-01 8.30%	7.89E-01 8.30%	7.89E-01 8.30%
MEAT	2.56E-01 2.69%	2.56E-01 2.69%	3.23E-07 .08%	2.56E-01 2.69%	2.56E-01 2.69%	2.56E-01 2.69%	2.56E-01 2.69%	2.56E-01 2.69%
TOTAL	9.51E+00	9.51E+00	4.20E-04	9.51E+00	9.51E+00	9.51E+00	9.51E+00	9.51E+00
(1) PER CAPITA DOSE (REM)	4.85E-06	4.85E-06	2.14E-10	4.85E-06	4.85E-06	4.85E-06	4.85E-06	4.85E-06
APR - JUN								
PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.81E-03 .11%	2.81E-03 .11%	2.81E-03 58.04%	2.81E-03 .11%	2.81E-03 .11%	2.81E-03 .11%	2.81E-03 .11%	6.81E-03 .26%
GROUND	2.02E-03 .08%	2.02E-03 .08%	2.02E-03 41.65%	2.02E-03 .08%	2.02E-03 .08%	2.02E-03 .08%	2.02E-03 .08%	2.37E-03 .09%
INHAL	9.87E-01 37.22%	9.87E-01 37.22%	9.42E-06 .19%	9.87E-01 37.23%	9.87E-01 37.23%	9.88E-01 37.23%	9.88E-01 37.26%	9.87E-01 37.16%
VEGET	1.36E+00 51.29%	1.36E+00 51.29%	4.55E-06 .09%	1.36E+00 51.29%	1.36E+00 51.29%	1.36E+00 51.28%	1.36E+00 51.26%	1.36E+00 51.20%
COW MILK	2.47E-01 9.32%	2.47E-01 9.32%	9.19E-07 .02%	2.47E-01 9.32%	2.47E-01 9.32%	2.47E-01 9.32%	2.47E-01 9.32%	2.47E-01 9.31%
MEAT	5.26E-02 1.98%	5.26E-02 1.98%	2.29E-08 .00%	5.26E-02 1.98%	5.26E-02 1.98%	5.26E-02 1.98%	5.26E-02 1.98%	5.26E-02 1.98%
TOTAL	2.65E+00	2.65E+00	4.84E-03	2.65E+00	2.65E+00	2.65E+00	2.65E+00	2.66E+00
(1) PER CAPITA DOSE (REM)	1.35E-06	1.35E-06	2.47E-09	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.36E-06

Table 44: (continued)
Integrated Population Dose for 2011

JAN - JUN								
PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	3.12E-03 .03%	3.12E-03 .03%	3.12E-03 59.31%	3.12E-03 .03%	3.12E-03 .03%	3.12E-03 .03%	3.12E-03 .03%	7.44E-03 .06%
GROUND	2.05E-03 .02%	2.05E-03 .02%	2.05E-03 38.91%	2.05E-03 .02%	2.05E-03 .02%	2.05E-03 .02%	2.05E-03 .02%	2.41E-03 .02%
INHAL	3.83E+00 31.52%	3.83E+00 31.52%	3.27E-05 .62%	3.83E+00 31.52%	3.83E+00 31.52%	3.84E+00 31.53%	3.83E+00 31.52%	3.83E+00 31.50%
VEGET	6.98E+00 57.38%	6.98E+00 57.38%	5.32E-05 1.01%	6.98E+00 57.38%	6.98E+00 57.38%	6.98E+00 57.37%	6.98E+00 57.38%	6.98E+00 57.36%
COW MILK	1.04E+00 8.52%	1.04E+00 8.52%	7.52E-06 .14%	1.04E+00 8.52%	1.04E+00 8.52%	1.04E+00 8.52%	1.04E+00 8.52%	1.04E+00 8.52%
MEAT	3.08E-01 2.54%	3.08E-01 2.54%	3.46E-07 .01%	3.08E-01 2.54%	3.08E-01 2.54%	3.08E-01 2.53%	3.08E-01 2.54%	3.08E-01 2.54%
TOTAL	1.22E+01	1.22E+01	5.26E-03	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01
(1) PER CAPITA DOSE (REM)	6.23E-06	6.23E-06	2.69E-09	6.23E-06	6.23E-06	6.23E-06	6.23E-06	6.23E-06
JUL - SEP								
PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	5.09E-04 .01%	5.09E-04 .01%	5.09E-04 97.43%	5.09E-04 .01%	5.09E-04 .01%	5.09E-04 .01%	5.09E-04 .01%	1.50E-03 .04%
GROUND	6.98E-06 .00%	6.98E-06 .00%	6.98E-06 1.33%	6.98E-06 .00%	6.98E-06 .00%	6.98E-06 .00%	6.98E-06 .00%	8.21E-06 .00%
INHAL	1.29E+00 31.81%	1.29E+00 31.81%	9.81E-07 .19%	1.29E+00 31.81%	1.29E+00 31.81%	1.29E+00 31.81%	1.29E+00 31.81%	1.29E+00 31.80%
VEGET	2.34E+00 57.52%	2.34E+00 57.52%	5.39E-06 1.03%	2.34E+00 57.52%	2.34E+00 57.52%	2.34E+00 57.52%	2.34E+00 57.52%	2.34E+00 57.50%
COW MILK	3.31E-01 8.14%	3.31E-01 8.14%	1.11E-07 .02%	3.31E-01 8.14%	3.31E-01 8.14%	3.31E-01 8.14%	3.31E-01 8.14%	3.31E-01 8.13%
MEAT	1.03E-01 2.52%	1.03E-01 2.52%	8.00E-09 .00%	1.03E-01 2.52%	1.03E-01 2.52%	1.03E-01 2.52%	1.03E-01 2.52%	1.03E-01 2.52%
TOTAL	4.07E+00	4.07E+00	5.23E-04	4.07E+00	4.07E+00	4.07E+00	4.07E+00	4.07E+00
(1) PER CAPITA DOSE (REM)	2.08E-06	2.08E-06	2.67E-10	2.08E-06	2.08E-06	2.08E-06	2.08E-06	2.08E-06

**Table 44: (continued)
Integrated Population Dose for 2011**

OCT - DEC								
PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	3.55E-04 .01%	3.55E-04 .01%	3.55E-04 73.71%	3.55E-04 .01%	3.55E-04 .01%	3.55E-04 .01%	3.55E-04 .01%	1.01E-03 .02%
GROUND	1.19E-04 .00%	1.19E-04 .00%	1.19E-04 24.81%	1.19E-04 .00%	1.19E-04 .00%	1.19E-04 .00%	1.19E-04 .00%	1.40E-04 .00%
INHAL	1.17E+00 25.22%	1.17E+00 25.22%	4.01E-06 .83%	1.17E+00 25.22%	1.17E+00 25.22%	1.17E+00 25.23%	1.17E+00 25.22%	1.17E+00 25.21%
VEGET	3.01E+00 65.03%	3.01E+00 65.03%	2.79E-06 .58%	3.01E+00 65.03%	3.01E+00 65.03%	3.01E+00 65.03%	3.01E+00 65.03%	3.01E+00 65.02%
COW MILK	3.09E-01 6.69%	3.09E-01 6.69%	3.24E-07 .07%	3.09E-01 6.69%	3.09E-01 6.69%	3.09E-01 6.69%	3.09E-01 6.69%	3.09E-01 6.69%
MEAT	1.41E-01 3.05%	1.41E-01 3.05%	1.55E-09 .00%	1.41E-01 3.05%	1.41E-01 3.05%	1.41E-01 3.04%	1.41E-01 3.05%	1.41E-01 3.05%
TOTAL	4.62E+00	4.62E+00	4.81E-04	4.62E+00	4.62E+00	4.63E+00	4.62E+00	4.62E+00
(1) PER CAPITA DOSE (REM)	2.36E-06	2.36E-06	2.46E-10	2.36E-06	2.36E-06	2.36E-06	2.36E-06	2.36E-06
JUL - DEC								
PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	8.64E-04 .01%	8.64E-04 .01%	8.64E-04 86.06%	8.64E-04 .01%	8.64E-04 .01%	8.64E-04 .01%	8.64E-04 .01%	2.51E-03 .03%
GROUND	1.26E-04 .00%	1.26E-04 .00%	1.26E-04 12.59%	1.26E-04 .00%	1.26E-04 .00%	1.26E-04 .00%	1.26E-04 .00%	1.48E-04 .00%
INHAL	2.46E+00 28.30%	2.46E+00 28.30%	4.99E-06 .50%	2.46E+00 28.30%	2.46E+00 28.30%	2.46E+00 28.31%	2.46E+00 28.31%	2.46E+00 28.30%
VEGET	5.35E+00 61.52%	5.35E+00 61.52%	8.18E-06 .81%	5.35E+00 61.52%	5.35E+00 61.52%	5.35E+00 61.51%	5.35E+00 61.51%	5.35E+00 61.50%
COW MILK	6.40E-01 7.37%	6.40E-01 7.37%	4.35E-07 .04%	6.40E-01 7.37%	6.40E-01 7.37%	6.40E-01 7.37%	6.40E-01 7.37%	6.40E-01 7.37%
MEAT	2.43E-01 2.80%	2.43E-01 2.80%	9.54E-09 .00%	2.43E-01 2.80%	2.43E-01 2.80%	2.43E-01 2.80%	2.43E-01 2.80%	2.43E-01 2.80%
TOTAL	8.69E+00	8.69E+00	1.00E-03	8.69E+00	8.69E+00	8.69E+00	8.69E+00	8.69E+00
(1) PER CAPITA DOSE (REM)	4.44E-06	4.44E-06	5.10E-10	4.44E-06	4.44E-06	4.44E-06	4.44E-06	4.44E-06

**Table 44: (continued)
Integrated Population Dose for 2011**

JAN - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	3.99E-03 .02%	3.99E-03 .02%	3.99E-03 63.59%	3.99E-03 .02%	3.99E-03 .02%	3.99E-03 .02%	3.99E-03 .02%	9.96E-03 .05%
GROUND	2.17E-03 .01%	2.17E-03 .01%	2.17E-03 34.69%	2.17E-03 .01%	2.17E-03 .01%	2.17E-03 .01%	2.17E-03 .01%	2.56E-03 .01%
INHAL	6.29E+00 30.18%	6.29E+00 30.18%	3.77E-05 .60%	6.29E+00 30.18%	6.29E+00 30.18%	6.30E+00 30.19%	6.29E+00 30.18%	6.29E+00 30.17%
VEGET	1.23E+01 59.11%	1.23E+01 59.11%	6.14E-05 .98%	1.23E+01 59.11%	1.23E+01 59.11%	1.23E+01 59.10%	1.23E+01 59.10%	1.23E+01 59.09%
COW MILK	1.68E+00 8.04%	1.68E+00 8.04%	7.96E-06 .13%	1.68E+00 8.04%	1.68E+00 8.04%	1.68E+00 8.04%	1.68E+00 8.04%	1.68E+00 8.04%
MEAT	5.52E-01 2.65%	5.52E-01 2.65%	3.56E-07 .01%	5.52E-01 2.65%	5.52E-01 2.65%	5.52E-01 2.64%	5.52E-01 2.65%	5.52E-01 2.65%
TOTAL	2.08E+01	2.08E+01	6.27E-03	2.08E+01	2.08E+01	2.09E+01	2.08E+01	2.09E+01
(1) PER CAPITA DOSE (REM)	1.06E-05	1.06E-05	3.20E-09	1.06E-05	1.06E-05	1.07E-05	1.06E-05	1.07E-05

Note 1: Personrem total divided by 50-mile population of 1,959,000

**Table 45:
Summary of Individual Doses for 2011**

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	1.06E-03	4.28E-03	2.99E-04	7.57E-04	6.21E-03
ODCM Req. 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.12E-02	8.56E-02	5.98E-03	1.51E-02	6.21E-02
Beta Air Dose	mrad	3.98E-04	1.81E-03	2.09E-04	4.14E-04	2.74E-03
ODCM Req. 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	3.98E-03	1.81E-02	2.09E-03	4.14E-03	1.37E-02
Maximum Individual						
Total Body	mrem	7.07E-04	2.84E-03	1.98E-04	5.01E-04	4.12E-03
Skin	mrem	1.14E-03	4.65E-03	3.85E-04	8.71E-04	6.83E-03
Site Boundary Location						
Unit 1	miles	1.27 SE	1.40 SSW	1.70 SSE	1.40 SSW	1.40 SSW
Unit 2	miles	1.31 SE	1.14 SSW	1.88 SSE	1.14 SSW	1.14 SSW
Unit 3	miles	1.40 SE	1.00 SSW	1.73 SSE	1.00 SSW	1.00 SSW
Maximum Organ Dose (excluding skin)	Age	Infant	Infant	Infant	Infant	Infant
	Organ	Bone	Bone	Bone	Bone	Bone
	mrem	2.08E-01	2.63E-01	1.73E-01	1.75E-01	8.19E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit ⁽¹⁾	%	2.77E+00	3.51E+00	2.31E+00	2.33E+00	5.46E+00
Location						
Unit 1	miles	2.30 ENE	2.30 ENE	2.30 ENE	2.30 ENE	2.30 ENE
Unit 2	miles	2.52 ENE	2.52 ENE	2.52 ENE	2.52 ENE	2.52 ENE
Unit 3	miles	2.70 NE	2.70 NE	2.70 NE	2.70 NE	2.70 NE
Maximum Organ Dose excluding C-14 ⁽³⁾ (excluding skin)	Age	Teen	Infant	Infant	Teen	Infant
	Organ	Thyroid (2)	Thyroid	Thyroid (2)	Thyroid (2)	Thyroid
	mrem	1.81E-01	1.04E-01	1.29E-01	1.02E-01	4.51E-01
ODCM Req. 4.2 Limit		7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit ⁽¹⁾		2.41E+00	1.39E+00	1.72E+00	1.36E+00	3.01E+00
Organ dose from tritium only for Unit 2 location above	mrem	1.80E-01	9.99E-02	1.29E-01	1.01E-01	4.42E-01
Fraction of organ dose from tritium only for Unit 2 location above ^(2,3)	%	86.5%	38.0%	74.6%	57.7%	54.0%
X/Q for Unit 2 location above	sec/m ³	9.76E-07	1.14E-06	7.87E-07	8.10E-07	9.29E-07
D/Q for Unit 2 location above	m ⁻²	1.25E-09	2.24E-09	2.37E-09	8.31E-10	1.67E-09
Note 1: ODCM Requirement 5.1 has higher limits than ODCM Requirement 4.2, therefore the percent of limits are more conservative based on ODCM Requirement 4.2 than on ODCM Requirement 5.1.						
Note 2: All organs except bone						
Note 3 Refer to discussion in section 10.4						

APPENDIX D

NEI 07-07 GROUNDWATER PROTECTION INITIATIVE SAMPLING

APP Groundwater Monitoring Locations – Water Quality Sampling

Legend

- Shallow Aquifer Monitoring Well
- ▲ Palo Verde Clay Aquifer Monitoring Well
- Regional Aquifer Monitoring Well



Onsite Radiological Groundwater Monitoring Data

APP-10	1/7/11	Tritium	<273	pCi/L	Routine
APP-10	4/27/11	Iodine-131	<3.5	pCi/L	Routine
APP-10	4/27/11	Cesium-134	<3.3	pCi/L	Routine
APP-10	4/27/11	Cobalt-60	<2.3	pCi/L	Routine
APP-10	4/27/11	Cesium-137	<2.0	pCi/L	Routine
APP-10	4/27/11	Tritium	<252	pCi/L	Routine
APP-10	9/1/11	Tritium	<242	pCi/L	Routine
APP-10	10/28/11	Cobalt-60	<3.4	pCi/L	Routine
APP-10	10/28/11	Cesium-137	<3.3	pCi/L	Routine
APP-10	10/28/11	Cesium-134	<3.4	pCi/L	Routine
APP-10	10/28/11	Tritium	<250	pCi/L	Routine
APP-10 DUP	9/1/11	Tritium	<262	pCi/L	Routine QA/QC sampling
APP-12	1/7/11	Tritium	<273	pCi/L	Routine
APP-12	4/27/11	Cesium-134	<3.2	pCi/L	Routine
APP-12	4/27/11	Iodine-131	<4.1	pCi/L	Routine
APP-12	4/27/11	Tritium	<252	pCi/L	Routine
APP-12	4/27/11	Strontium-90	<0.4	pCi/L	Routine
APP-12	4/27/11	Cobalt-60	<2.1	pCi/L	Routine
APP-12	4/27/11	Cesium-137	<2.0	pCi/L	Routine
APP-12	9/1/11	Tritium	<242	pCi/L	Routine
APP-12	10/28/11	Cobalt-60	<3.1	pCi/L	Routine
APP-12	10/28/11	Cesium-134	<3.5	pCi/L	Routine
APP-12	10/28/11	Tritium	<250	pCi/L	Routine
APP-12	10/28/11	Cesium-137	<3.3	pCi/L	Routine
APP-12 DUP	9/1/11	Tritium	<242	pCi/L	Routine
APP-13	3/11/11	Tritium	<254	pCi/L	Routine
APP-13	5/26/11	Iodine-131	<3.4	pCi/L	Routine
APP-13	5/26/11	Cesium-134	<3.3	pCi/L	Routine
APP-13	5/26/11	Cesium-137	<3.1	pCi/L	Routine
APP-13	5/26/11	Cobalt-60	<2.9	pCi/L	Routine
APP-13	5/26/11	Tritium	<254	pCi/L	Routine
APP-13	8/17/11	Tritium	<244	pCi/L	Routine
APP-14	3/11/11	Tritium	<254	pCi/L	Routine
APP-14	5/26/11	Tritium	<254	pCi/L	Routine
APP-14	5/26/11	Cesium-137	<3.1	pCi/L	Routine
APP-14	5/26/11	Cesium-134	<3.3	pCi/L	Routine
APP-14	5/26/11	Iodine-131	<3.7	pCi/L	Routine
APP-14	5/26/11	Cobalt-60	<3.0	pCi/L	Routine
APP-14	8/17/11	Tritium	<244	pCi/L	Routine
APP-15	3/11/11	Tritium	<254	pCi/L	Routine
APP-15	5/26/11	Tritium	<254	pCi/L	Routine
APP-15	5/26/11	Iodine-131	<3.6	pCi/L	Routine
APP-15	5/26/11	Cobalt-60	<2.8	pCi/L	Routine
APP-15	5/26/11	Cesium-137	<3.0	pCi/L	Routine
APP-15	5/26/11	Cesium-134	<3.1	pCi/L	Routine
APP-15	8/17/11	Tritium	<244	pCi/L	Routine

Onsite Radiological Groundwater Monitoring Data

APP-15	12/7/11	Cesium-134	<2.5	pCi/L	Routine
APP-15	12/7/11	Cesium-137	<2.5	pCi/L	Routine
APP-15	12/7/11	Tritium	<245	pCi/L	Routine
APP-15	12/7/11	Cobalt-60	<2.5	pCi/L	Routine
APP-15 Dup	3/11/11	Tritium	<254	pCi/L	Routine
APP-18	2/17/11	Tritium	<256	pCi/L	Routine
APP-18	6/3/11	Cesium-137	<3.6	pCi/L	Routine
APP-18	6/3/11	Tritium	<250	pCi/L	Routine
APP-18	6/3/11	Iodine-131	<3.7	pCi/L	Routine
APP-18	6/3/11	Cesium-134	<3.7	pCi/L	Routine
APP-18	6/3/11	Cobalt-60	<2.1	pCi/L	Routine
APP-18	7/27/11	Tritium	<258	pCi/L	Routine
APP-18	12/7/11	Tritium	<245	pCi/L	Routine
APP-18	12/7/11	Cesium-134	<2.5	pCi/L	Routine
APP-18	12/7/11	Cesium-137	<2.3	pCi/L	Routine
APP-18	12/7/11	Cobalt-60	<2.5	pCi/L	Routine
APP-19	1/25/11	Cobalt-60	<2.9	pCi/L	Ambient monitoring
APP-19	1/25/11	Tritium	<255	pCi/L	Ambient monitoring
APP-19	1/25/11	Cesium-137	<3.0	pCi/L	Ambient monitoring
APP-19	1/25/11	Cesium-134	<3.1	pCi/L	Ambient monitoring
APP-19	1/25/11	Iodine-131	<4.1	pCi/L	Ambient monitoring
APP-19	2/2/11	Iodine-131	<4.2	pCi/L	Ambient monitoring
APP-19	2/2/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-19	2/2/11	Tritium	<249	pCi/L	Ambient monitoring
APP-19	2/2/11	Cobalt-60	<3.2	pCi/L	Ambient monitoring
APP-19	2/2/11	Cesium-137	<3.0	pCi/L	Ambient monitoring
APP-19	3/3/11	Cesium-134	<3.2	pCi/L	Ambient monitoring
APP-19	3/3/11	Tritium	<252	pCi/L	Ambient monitoring
APP-19	3/3/11	Cesium-137	<3.1	pCi/L	Ambient monitoring
APP-19	3/3/11	Iodine-131	<3.6	pCi/L	Ambient monitoring
APP-19	3/3/11	Cobalt-60	<2.8	pCi/L	Ambient monitoring
APP-19	4/28/11	Cesium-134	<3.2	pCi/L	Ambient monitoring
APP-19	4/28/11	Cesium-137	<1.9	pCi/L	Ambient monitoring
APP-19	4/28/11	Cobalt-60	<1.8	pCi/L	Ambient monitoring
APP-19	4/28/11	Iodine-131	<3.1	pCi/L	Ambient monitoring
APP-19	4/28/11	Tritium	<252	pCi/L	Ambient monitoring
APP-19	5/4/11	Iodine-131	<3.2	pCi/L	Ambient monitoring
APP-19	5/4/11	Tritium	<233	pCi/L	Ambient monitoring
APP-19	5/4/11	Cobalt-60	<2.8	pCi/L	Ambient monitoring
APP-19	5/4/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-19	5/4/11	Cesium-134	<3.2	pCi/L	Ambient monitoring
APP-19	6/2/11	Iodine-131	<3.6	pCi/L	Ambient monitoring
APP-19	6/2/11	Tritium	<250	pCi/L	Ambient monitoring
APP-19	6/2/11	Cobalt-60	<2.8	pCi/L	Ambient monitoring
APP-19	6/2/11	Cesium-137	<3.0	pCi/L	Ambient monitoring
APP-19	6/2/11	Cesium-134	<3.2	pCi/L	Ambient monitoring

Onsite Radiological Groundwater Monitoring Data

APP-19	7/7/11	Tritium	<249	pCi/L	Ambient monitoring
APP-19	7/7/11	Cesium-134	<3.4	pCi/L	Ambient monitoring
APP-19	7/7/11	Cobalt-60	<3.2	pCi/L	Ambient monitoring
APP-19	7/7/11	Cesium-137	<3.3	pCi/L	Ambient monitoring
APP-19	7/7/11	Iodine-131	<3.1	pCi/L	Ambient monitoring
APP-19	8/3/11	Cesium-134	<3.6	pCi/L	Ambient monitoring
APP-19	8/3/11	Iodine-131	<3.9	pCi/L	Ambient monitoring
APP-19	8/3/11	Tritium	<258	pCi/L	Ambient monitoring
APP-19	8/3/11	Cesium-137	<3.5	pCi/L	Ambient monitoring
APP-19	8/3/11	Cobalt-60	<3.3	pCi/L	Ambient monitoring
APP-19	9/22/11	Cesium-137	<3.4	pCi/L	Ambient monitoring
APP-19	9/22/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-19	9/22/11	Iodine-131	<3.3	pCi/L	Ambient monitoring
APP-19	9/22/11	Tritium	<238	pCi/L	Ambient monitoring
APP-19	9/22/11	Cobalt-60	<3.5	pCi/L	Ambient monitoring
APP-19	10/26/11	Cesium-137	<3.1	pCi/L	Ambient monitoring
APP-19	10/26/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-19	10/26/11	Iodine-131	<3.9	pCi/L	Ambient monitoring
APP-19	10/26/11	Tritium	<250	pCi/L	Ambient monitoring
APP-19	10/26/11	Cobalt-60	<3.2	pCi/L	Ambient monitoring
APP-19	11/3/11	Cesium-137	<3.3	pCi/L	Ambient monitoring
APP-19	11/3/11	Iodine-131	<3.0	pCi/L	Ambient monitoring
APP-19	11/3/11	Cobalt-60	<3.3	pCi/L	Ambient monitoring
APP-19	11/3/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-19	11/3/11	Tritium	<249	pCi/L	Ambient monitoring
APP-19 Dup	2/2/11	Cobalt-60	<2.9	pCi/L	Ambient monitoring QA/QC
APP-19 Dup	2/2/11	Cesium-137	<3.0	pCi/L	Ambient monitoring QA/QC
APP-19 Dup	2/2/11	Cesium-134	<3.2	pCi/L	Ambient monitoring QA/QC
APP-19 Dup	2/2/11	Tritium	<249	pCi/L	Ambient monitoring QA/QC
APP-19 Dup	2/2/11	Iodine-131	<4.2	pCi/L	Ambient monitoring QA/QC
APP-19 DUP	8/3/11	Cobalt-60	<3.0	pCi/L	Ambient monitoring QA/QC
APP-19 DUP	8/3/11	Tritium	<258	pCi/L	Ambient monitoring QA/QC
APP-19 DUP	8/3/11	Iodine-131	<3.8	pCi/L	Ambient monitoring QA/QC
APP-19 DUP	8/3/11	Cesium-134	<3.4	pCi/L	Ambient monitoring QA/QC
APP-19 DUP	8/3/11	Cesium-137	<3.2	pCi/L	Ambient monitoring QA/QC
APP-20	1/26/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-20	1/26/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-20	1/26/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-20	1/26/11	Iodine-131	<3.7	pCi/L	Ambient monitoring
APP-20	1/26/11	Tritium	<255	pCi/L	Ambient monitoring
APP-20	2/2/11	Cobalt-60	<3.2	pCi/L	Ambient monitoring
APP-20	2/2/11	Tritium	<243	pCi/L	Ambient monitoring
APP-20	2/2/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-20	2/2/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-20	2/2/11	Iodine-131	<3.4	pCi/L	Ambient monitoring
APP-20	3/2/11	Tritium	<252	pCi/L	Ambient monitoring

Onsite Radiological Groundwater Monitoring Data

APP-20	3/2/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-20	3/2/11	Cesium-137	<3.0	pCi/L	Ambient monitoring
APP-20	3/2/11	Cesium-134	<3.2	pCi/L	Ambient monitoring
APP-20	3/2/11	Iodine-131	<3.3	pCi/L	Ambient monitoring
APP-20	4/21/11	Cobalt-60	<2.6	pCi/L	Ambient monitoring
APP-20	4/21/11	Cesium-137	<2.4	pCi/L	Ambient monitoring
APP-20	4/21/11	Cesium-134	<2.2	pCi/L	Ambient monitoring
APP-20	4/21/11	Iodine-131	<3.6	pCi/L	Ambient monitoring
APP-20	4/21/11	Tritium	<254	pCi/L	Ambient monitoring
APP-20	5/4/11	Cobalt-60	<3.3	pCi/L	Ambient monitoring
APP-20	5/4/11	Cesium-137	<1.8	pCi/L	Ambient monitoring
APP-20	5/4/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-20	5/4/11	Iodine-131	<3.4	pCi/L	Ambient monitoring
APP-20	5/4/11	Tritium	<233	pCi/L	Ambient monitoring
APP-20	6/2/11	Cesium-134	<3.1	pCi/L	Ambient monitoring
APP-20	6/2/11	Cesium-137	<3.1	pCi/L	Ambient monitoring
APP-20	6/2/11	Iodine-131	<3.1	pCi/L	Ambient monitoring
APP-20	6/2/11	Cobalt-60	<2.8	pCi/L	Ambient monitoring
APP-20	6/2/11	Tritium	<250	pCi/L	Ambient monitoring
APP-20	7/7/11	Cesium-134	<3.2	pCi/L	Ambient monitoring
APP-20	7/7/11	Cesium-137	<3.1	pCi/L	Ambient monitoring
APP-20	7/7/11	Cobalt-60	<2.9	pCi/L	Ambient monitoring
APP-20	7/7/11	Tritium	<249	pCi/L	Ambient monitoring
APP-20	7/7/11	Iodine-131	<3.2	pCi/L	Ambient monitoring
APP-20	8/3/11	Tritium	<258	pCi/L	Ambient monitoring
APP-20	8/3/11	Iodine-131	<3.4	pCi/L	Ambient monitoring
APP-20	8/3/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-20	8/3/11	Cesium-137	<3.3	pCi/L	Ambient monitoring
APP-20	8/3/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-20	9/22/11	Tritium	<238	pCi/L	Ambient monitoring
APP-20	9/22/11	Cobalt-60	<3.2	pCi/L	Ambient monitoring
APP-20	9/22/11	Cesium-137	<3.3	pCi/L	Ambient monitoring
APP-20	9/22/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-20	9/22/11	Iodine-131	<3.4	pCi/L	Ambient monitoring
APP-20	10/26/11	Cobalt-60	<3.3	pCi/L	Ambient monitoring
APP-20	10/26/11	Cesium-137	<3.3	pCi/L	Ambient monitoring
APP-20	10/26/11	Cesium-134	<3.4	pCi/L	Ambient monitoring
APP-20	10/26/11	Iodine-131	<3.6	pCi/L	Ambient monitoring
APP-20	10/26/11	Tritium	<250	pCi/L	Ambient monitoring
APP-20	11/3/11	Cobalt-60	<3.0	pCi/L	Ambient monitoring
APP-20	11/3/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-20	11/3/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-20	11/3/11	Iodine-131	<3.2	pCi/L	Ambient monitoring
APP-20	11/3/11	Tritium	<249	pCi/L	Ambient monitoring
APP-21	1/28/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-21	1/28/11	Tritium	<258	pCi/L	Ambient monitoring

Onsite Radiological Groundwater Monitoring Data

APP-21	1/28/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-21	1/28/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-21	1/28/11	Iodine-131	<3.8	pCi/L	Ambient monitoring
APP-21	2/2/11	Tritium	<243	pCi/L	Ambient monitoring
APP-21	2/2/11	Cobalt-60	<3.0	pCi/L	Ambient monitoring
APP-21	2/2/11	Cesium-137	<3.0	pCi/L	Ambient monitoring
APP-21	2/2/11	Cesium-134	<3.2	pCi/L	Ambient monitoring
APP-21	2/2/11	Iodine-131	<4.4	pCi/L	Ambient monitoring
APP-21	3/2/11	Cesium-134	<3.4	pCi/L	Ambient monitoring
APP-21	3/2/11	Tritium	<252	pCi/L	Ambient monitoring
APP-21	3/2/11	Cesium-137	<3.1	pCi/L	Ambient monitoring
APP-21	3/2/11	Iodine-131	<3.9	pCi/L	Ambient monitoring
APP-21	3/2/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-21	4/21/11	Tritium	<254	pCi/L	Ambient monitoring
APP-21	4/21/11	Cesium-134	<2.5	pCi/L	Ambient monitoring
APP-21	4/21/11	Iodine-131	<3.6	pCi/L	Ambient monitoring
APP-21	4/21/11	Cesium-137	<2.5	pCi/L	Ambient monitoring
APP-21	4/21/11	Cobalt-60	<2.5	pCi/L	Ambient monitoring
APP-21	5/4/11	Tritium	<233	pCi/L	Ambient monitoring
APP-21	5/4/11	Iodine-131	<3.6	pCi/L	Ambient monitoring
APP-21	5/4/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-21	5/4/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-21	5/4/11	Cobalt-60	<3.0	pCi/L	Ambient monitoring
APP-21	6/2/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-21	6/2/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-21	6/2/11	Cobalt-60	<3.3	pCi/L	Ambient monitoring
APP-21	6/2/11	Iodine-131	<3.2	pCi/L	Ambient monitoring
APP-21	6/2/11	Tritium	<250	pCi/L	Ambient monitoring
APP-21	7/7/11	Cobalt-60	<3.3	pCi/L	Ambient monitoring
APP-21	7/7/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-21	7/7/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-21	7/7/11	Iodine-131	<3.3	pCi/L	Ambient monitoring
APP-21	7/7/11	Tritium	<249	pCi/L	Ambient monitoring
APP-21	8/3/11	Iodine-131	<3.6	pCi/L	Ambient monitoring
APP-21	8/3/11	Cobalt-60	<3.5	pCi/L	Ambient monitoring
APP-21	8/3/11	Cesium-134	<3.6	pCi/L	Ambient monitoring
APP-21	8/3/11	Tritium	<258	pCi/L	Ambient monitoring
APP-21	8/3/11	Cesium-137	<3.5	pCi/L	Ambient monitoring
APP-21	9/22/11	Cesium-137	<3.1	pCi/L	Ambient monitoring
APP-21	9/22/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-21	9/22/11	Iodine-131	<3.6	pCi/L	Ambient monitoring
APP-21	9/22/11	Tritium	<238	pCi/L	Ambient monitoring
APP-21	9/22/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-21	10/26/11	Iodine-131	<3.8	pCi/L	Ambient monitoring
APP-21	10/26/11	Cobalt-60	<3.0	pCi/L	Ambient monitoring
APP-21	10/26/11	Cesium-134	<3.1	pCi/L	Ambient monitoring

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APP-21	10/26/11	Tritium	<250	pCi/L	Ambient monitoring
APP-21	10/26/11	Cesium-137	<3.1	pCi/L	Ambient monitoring
APP-21	11/3/11	Tritium	<249	pCi/L	Ambient monitoring
APP-21	11/3/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-21	11/3/11	Cesium-137	<3.3	pCi/L	Ambient monitoring
APP-21	11/3/11	Iodine-131	<4.4	pCi/L	Ambient monitoring
APP-21	11/3/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-21 DUP	4/21/11	Tritium	<254	pCi/L	Ambient monitoring QA/QC
APP-21 DUP	4/21/11	Cobalt-60	<2.5	pCi/L	Ambient monitoring QA/QC
APP-21 DUP	4/21/11	Cesium-137	<2.5	pCi/L	Ambient monitoring QA/QC
APP-21 DUP	4/21/11	Iodine-131	<3.5	pCi/L	Ambient monitoring QA/QC
APP-21 DUP	4/21/11	Cesium-134	<2.5	pCi/L	Ambient monitoring QA/QC
APP-21 DUP	7/7/11	Tritium	<249	pCi/L	Ambient monitoring QA/QC
APP-21 DUP	7/7/11	Iodine-131	<3.4	pCi/L	Ambient monitoring QA/QC
APP-21 DUP	7/7/11	Cesium-134	<3.2	pCi/L	Ambient monitoring QA/QC
APP-21 DUP	7/7/11	Cesium-137	<3.1	pCi/L	Ambient monitoring QA/QC
APP-21 DUP	7/7/11	Cobalt-60	<2.9	pCi/L	Ambient monitoring QA/QC
APP-22	1/24/11	Tritium	<255	pCi/L	Ambient monitoring
APP-22	1/24/11	Cesium-137	<3.4	pCi/L	Ambient monitoring
APP-22	1/24/11	Cobalt-60	<3.4	pCi/L	Ambient monitoring
APP-22	1/24/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-22	1/24/11	Iodine-131	<4.4	pCi/L	Ambient monitoring
APP-22	2/1/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-22	2/1/11	Tritium	<243	pCi/L	Ambient monitoring
APP-22	2/1/11	Cesium-137	<3.4	pCi/L	Ambient monitoring
APP-22	2/1/11	Iodine-131	<4.2	pCi/L	Ambient monitoring
APP-22	2/1/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-22	3/1/11	Iodine-131	<3.9	pCi/L	Ambient monitoring
APP-22	3/1/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-22	3/1/11	Cobalt-60	<3.0	pCi/L	Ambient monitoring
APP-22	3/1/11	Tritium	<252	pCi/L	Ambient monitoring
APP-22	3/1/11	Cesium-134	<3.2	pCi/L	Ambient monitoring
APP-22	4/20/11	Cesium-134	<2.5	pCi/L	Ambient monitoring
APP-22	4/20/11	Iodine-131	<4.2	pCi/L	Ambient monitoring
APP-22	4/20/11	Cesium-137	<2.6	pCi/L	Ambient monitoring
APP-22	4/20/11	Cobalt-60	<2.7	pCi/L	Ambient monitoring
APP-22	4/20/11	Tritium	<254	pCi/L	Ambient monitoring
APP-22	5/3/11	Cesium-134	<3.2	pCi/L	Ambient monitoring
APP-22	5/3/11	Iodine-131	<3.2	pCi/L	Ambient monitoring
APP-22	5/3/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-22	5/3/11	Cobalt-60	<2.8	pCi/L	Ambient monitoring
APP-22	5/3/11	Tritium	<233	pCi/L	Ambient monitoring
APP-22	6/2/11	Cesium-137	<3.2	pCi/L	Ambient monitoring
APP-22	6/2/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-22	6/2/11	Cesium-134	<3.3	pCi/L	Ambient monitoring
APP-22	6/2/11	Iodine-131	<3.5	pCi/L	Ambient monitoring

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APP-22	6/2/11	Tritium	<250	pCi/L	Ambient monitoring
APP-22	7/6/11	Cesium-137	<2.3	pCi/L	Ambient monitoring
APP-22	7/6/11	Tritium	<249	pCi/L	Ambient monitoring
APP-22	7/6/11	Iodine-131	<3.9	pCi/L	Ambient monitoring
APP-22	7/6/11	Cobalt-60	<2.4	pCi/L	Ambient monitoring
APP-22	7/6/11	Cesium-134	<2.5	pCi/L	Ambient monitoring
APP-22	8/2/11	Cesium-134	<3.5	pCi/L	Ambient monitoring
APP-22	8/2/11	Cesium-137	<3.3	pCi/L	Ambient monitoring
APP-22	8/2/11	Tritium	<258	pCi/L	Ambient monitoring
APP-22	8/2/11	Cobalt-60	<3.1	pCi/L	Ambient monitoring
APP-22	8/2/11	Iodine-131	<3.8	pCi/L	Ambient monitoring
APP-22	9/21/11	Cobalt-60	<3.3	pCi/L	Ambient monitoring
APP-22	9/21/11	Tritium	<238	pCi/L	Ambient monitoring
APP-22	9/21/11	Iodine-131	<4.4	pCi/L	Ambient monitoring
APP-22	9/21/11	Cesium-134	<3.6	pCi/L	Ambient monitoring
APP-22	9/21/11	Cesium-137	<3.3	pCi/L	Ambient monitoring
APP-22	10/25/11	Cesium-137	<3.6	pCi/L	Ambient monitoring
APP-22	10/25/11	Tritium	<250	pCi/L	Ambient monitoring
APP-22	10/25/11	Cobalt-60	<3.5	pCi/L	Ambient monitoring
APP-22	10/25/11	Cesium-134	<3.7	pCi/L	Ambient monitoring
APP-22	10/25/11	Iodine-131	<4.0	pCi/L	Ambient monitoring
APP-22	11/2/11	Cesium-137	<3.5	pCi/L	Ambient monitoring
APP-22	11/2/11	Cobalt-60	<3.4	pCi/L	Ambient monitoring
APP-22	11/2/11	Tritium	<249	pCi/L	Ambient monitoring
APP-22	11/2/11	Iodine-131	<4.4	pCi/L	Ambient monitoring
APP-22	11/2/11	Cesium-134	<3.7	pCi/L	Ambient monitoring
APP-3	2/10/11	Tritium	<244	pCi/L	Routine
APP-3	4/27/11	Cobalt-60	<3.3	pCi/L	Routine
APP-3	4/27/11	Tritium	<252	pCi/L	Routine
APP-3	4/27/11	Iodine-131	<3.7	pCi/L	Routine
APP-3	4/27/11	Cesium-134	<3.3	pCi/L	Routine
APP-3	4/27/11	Cesium-137	<3.3	pCi/L	Routine
APP-3	7/20/11	Tritium	<258	pCi/L	Routine
APP-4R	2/11/11	Tritium	<244	pCi/L	Routine
APP-4R	4/28/11	Iodine-131	<3.5	pCi/L	Routine
APP-4R	4/28/11	Cobalt-60	<1.7	pCi/L	Routine
APP-4R	4/28/11	Tritium	<252	pCi/L	Routine
APP-4R	4/28/11	Cesium-137	<2.1	pCi/L	Routine
APP-4R	4/28/11	Cesium-134	<3.3	pCi/L	Routine
APP-4R	9/1/11	Tritium	<242	pCi/L	Routine
APP-4R	10/27/11	Tritium	<250	pCi/L	Routine
APP-4R	10/27/11	Cobalt-60	<2.9	pCi/L	Routine
APP-4R	10/27/11	Cesium-137	<3.0	pCi/L	Routine
APP-4R	10/27/11	Cesium-134	<3.3	pCi/L	Routine
APP-4R	10/27/11	Iodine-131	<3.9	pCi/L	Routine
APP-5	2/24/11	Tritium	<246	pCi/L	Routine

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APP-5	5/26/11	Iodine-131	<4.4	pCi/L	Routine
APP-5	5/26/11	Cesium-134	<3.5	pCi/L	Routine
APP-5	5/26/11	Cesium-137	<3.4	pCi/L	Routine
APP-5	5/26/11	Cobalt-60	<3.2	pCi/L	Routine
APP-5	5/26/11	Tritium	<254	pCi/L	Routine
APP-5	7/28/11	Tritium	<258	pCi/L	Routine
APP-6	2/24/11	Tritium	<255	pCi/L	Routine
APP-6	6/16/11	Cobalt-60	<2.8	pCi/L	Routine
APP-6	6/16/11	Iodine-131	<3.7	pCi/L	Routine
APP-6	6/16/11	Cesium-134	<3.2	pCi/L	Routine
APP-6	6/16/11	Tritium	<253	pCi/L	Routine
APP-6	6/16/11	Cesium-137	<3.0	pCi/L	Routine
APP-6	7/14/11	Tritium	<250	pCi/L	Routine
APP-7	3/24/11	Tritium	<257	pCi/L	Routine
APP-7	6/16/11	Tritium	<253	pCi/L	Routine
APP-7	6/16/11	Cobalt-60	<3.2	pCi/L	Routine
APP-7	6/16/11	Cesium-137	<3.3	pCi/L	Routine
APP-7	6/16/11	Iodine-131	<3.7	pCi/L	Routine
APP-7	6/16/11	Cesium-134	<3.3	pCi/L	Routine
APP-7	9/7/11	Tritium	<261	pCi/L	Routine
APP-7 DUP	6/16/11	Tritium	<253	pCi/L	Routine QA/QC sampling
APP-7 DUP	6/16/11	Iodine-131	<3.9	pCi/L	Routine QA/QC sampling
APP-7 DUP	6/16/11	Cesium-134	<3.1	pCi/L	Routine QA/QC sampling
APP-7 DUP	6/16/11	Cesium-137	<3.1	pCi/L	Routine QA/QC sampling
APP-7 DUP	6/16/11	Cobalt-60	<3.2	pCi/L	Routine QA/QC sampling
APP-9	1/26/11	Tritium	<255	pCi/L	Routine
APP-9	4/28/11	Tritium	<252	pCi/L	Routine
APP-9	4/28/11	Iodine-131	<3.3	pCi/L	Routine
APP-9	4/28/11	Cesium-134	<3.3	pCi/L	Routine
APP-9	4/28/11	Cesium-137	<2.0	pCi/L	Routine
APP-9	4/28/11	Cobalt-60	<3.3	pCi/L	Routine
APP-9	9/1/11	Tritium	<242	pCi/L	Routine
APP-9	10/28/11	Cesium-137	<3.5	pCi/L	Routine
APP-9	10/28/11	Tritium	<250	pCi/L	Routine
APP-9	10/28/11	Cesium-134	<3.4	pCi/L	Routine
APP-9	10/28/11	Cobalt-60	<3.5	pCi/L	Routine
APP-9 DUP	9/1/11	Tritium	<242	pCi/L	Routine QA/QC sampling
PV-14H	2/24/11	Tritium	<255	pCi/L	Routine
PV-14H	6/15/11	Tritium	<253	pCi/L	Routine
PV-14H	6/15/11	Iodine-131	<3.6	pCi/L	Routine
PV-14H	6/15/11	Cesium-134	<3.4	pCi/L	Routine
PV-14H	6/15/11	Cesium-137	<3.3	pCi/L	Routine
PV-14H	6/15/11	Cobalt-60	<3.3	pCi/L	Routine
PV-14H	8/29/11	Tritium	<242	pCi/L	Routine
PV-14H	11/2/11	Cesium-134	<3.3	pCi/L	Routine
PV-14H	11/2/11	Cesium-137	<3.1	pCi/L	Routine