Technical Specification 5.6.3
Technical Requirements Manual 3.7.102.4

Palo Verde
Nuclear Generating Station
PO Box 52034
Phoenix, Arizona 85072-2034
Mail Station 7636

102-07699 MDD/MSC
April 27, 2018

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

Dear Sirs:

Subject: **Palo Verde Nuclear Generating Station (PVNGS)**
Units 1, 2, 3 and Independent Spent Fuel Storage Installation
Docket Nos. STN 50-528/529/530 and 72-44
Annual Radioactive Effluent Release Report 2017

In accordance with Technical Specification 5.6.3, the 2017 Annual Radioactive Effluent Release Report is enclosed.

PVNGS Technical Requirement Manual section 3.7.102.4 requires an annual report to be prepared and submitted if sealed source or fission detector leakage tests reveal the presence of greater than or equal to 0.005 microcuries of removable contamination. There were no events in 2017 that met this reporting threshold.

Appendix F of the enclosure provides corrections to the 2012-2016 Annual Radioactive Effluent Release Reports.

No new commitments are being made to the NRC by this letter. Should you need further information regarding this submittal, please contact Matthew S. Cox, Licensing Section Leader, at (623) 393-5753.

Sincerely,

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Enclosure: Palo Verde Nuclear Generating Station Units 1, 2 and 3 2017 Annual Radioactive Effluent Release Report

cc:

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Enclosure

Palo Verde Nuclear Generating Station
Units 1, 2 & 3
2017 Annual Radioactive Effluent Release Report

PALO VERDE NUCLEAR GENERATING STATION UNITS 1, 2 AND 3

2017 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

USNRC Docket No. STN 50-528/529/530

RCTSAI 1566

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TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

This report summarizes the 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 2017. 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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Offsite Dose Calculation Manual Palo Verde Nuclear Generating Station Units 1, 2 and 3, Rev. 27.

NEI 07-07, Nuclear Energy Institute, Industry Ground Water Protection Initiative – Final Guidance Document, August 2007.

Calculation 13-NC-CH-0200, Rev 7, FSAR - Primary Coolant Activities (PCA)

APPENDIX A: SOURCE TERMS AND EFFLUENT AND WASTE DISPOSAL REPORTS

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 µCi/ml for principal gamma emitters (except Ce-144)
3.0E-06 µCi/ml for Ce-144
1.0E-06 µCi/ml for I-131
1.0E-03 µCi/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 µCi/ml for Cs-134
2.0E-06 µCi/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 mrem to the total body and to less than or equal to 5 mrem to any organ, and

b. During any calendar year to less than or equal to 3 mrem to the total body and to less than or equal to 10 mrem 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 3,000 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 1,500 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 mrem to the total body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrem.

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

CR 18-06915 generated to evaluate the potential releases due to the loss of pressure from the waste gas decay tanks.

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

7.1 There were no revisions to the Offsite Dose Calculation Manual (ODCM) in 2017.

7.1 There were no revisions to the Process Control Program (PCP) in 2017.

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 effluents releases beyond the site boundary from PVNGS

8.3 Solid Waste

Solid Waste Shipments are summarized in Appendix A.

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 261 acres which is divided into three segments: Pond 1A (131 acres), Pond 1B (77.5 acres) and Pond 1C (52.5 acres). This equates to 3.22E+11 cc evaporated from Pond One for each of the first and fourth quarters and 8.85E+11 cc evaporated for each of the second and third quarters. Evaporation Pond Two is approximately 232 acres which is divided into three segments: Pond 2A (117 acres), Pond 2B (87 acres) and Pond 2C (30 acres). The amount evaporated from Pond Two is 2.86E+11 cc for each of the first and fourth quarters and 7.87E+11 cc for each of the second and third quarters.

Evaporation Pond Three is constructed of two smaller ponds of 90 acres each (3A and 3B). The amount evaporated from each section of Pond Three is 2.20E+11 cc for each of the first and fourth quarters and 6.04E+11 cc for each of the second and third quarters.

Using a site boundary X/Q of 5.0E-05 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 set points are based on an assumed one percent failed fuel source term. The current method used for the set point values are more reliable than basing the set points upon the constantly varying values of 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).

None.

9.6 Sample results from the 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 (all results below the Lower Limit of Detection).

9.7 REPORT ADDENDUM

Appendix F contains corrections to ARERRs from 2012 to 2016

10.0 DISCUSSION

10.1 Unit One

Unit One operated with a refueling outage (1R20) from October 7 to November 5, 2017.

Maintenance outages:
NONE

Estimated number of fuel defects[1]											
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 (2R20) from April 8 to May 8, 2017.

Maintenance outages:
NONE

Estimated number of fuel defects[1]											
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:
Unit 3 had one maintenance outage (3M20A) from May 10 to May 14, 2017.

Estimated number of fuel defects[1]											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	0	0	0	0	0	0	0	0

[1] Source: Institute of Nuclear Power (INPO), Consolidated Data Entry (CDE)

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 individuals 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 dose is measured in units of 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.[2]

The PVNGS calculated production of carbon-14 is 18.5 Curies per operating cycle (500 days) or 13.5 curies per year. The 13.5 curies will be divided equally between each quarter (3.38 curies per reactor). The estimated C-14 activity is included in all of the inhalation and ingestion dose calculations.

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.

[2] Source: NCRP Report No. 160, Table 1.1

10.6 Dose Summary

Dose for 2017 was primarily due to the release of tritium. Tritium production is estimated to be 1000 curies per Reactor Unit per year. In order to control plant tritium concentrations, tritium releases should match tritium production. For 2017, PVNGS released a total of 1,820 curies of tritium (see Table 39).

Table 1: Evaporation Pond Data					
Evaporation Pond 1(1A, 1B, 1C)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	3.22E+11	8.85E+11	8.85E+11	3.22E+11	
Tritium Concentration (uCi/cc)	1.15E-06	1.20E-06	1.19E-06	1.01E-06	
Tritium Curies	3.70E-01	1.06E+00	1.05E+00	3.27E-01	2.82E+00
Evaporation Pond 2 (2A and 2B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.52E+11	6.92E+11	6.92E+11	2.52E+11	
Tritium Concentration (uCi/cc)	9.60E-07	9.60E-07	5.80E-07	6.93E-07	
Tritium curies	2.42E-01	6.65E-01	4.01E-01	1.74E-01	1.48E+00
Evaporation Pond 3 (3A and 3B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.20E+11	6.04E+11	6.04E+11	2.20E+11	
Tritium Concentration (uCi/cc)	1.41E-06	8.47E-07	9.03E-07	5.41E-07	
Tritium curies	3.09E-01	5.11E-01	5.45E-01	1.19E-01	1.48E+00
Dose (mRem)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Pond 1	5.13E-03	1.48E-02	1.46E-02	4.53E-03	3.90E-02
Pond 2	3.35E-03	9.22E-03	5.57E-03	2.42E-03	2.06E-02
Pond 3	4.28E-03	7.09E-03	7.56E-03	1.65E-03	2.06E-02
Total	1.28E-02	3.11E-02	2.77E-02	8.60E-03	8.02E-02

Table 2: Batch Release Data			
All times are in hours	Unit 1	Unit 2	Unit 3
January - June			
Number of batch releases	20	37	23
Total time period for batch releases	85.73	1223.00	428.37
Maximum time period for a batch release	63.00	168.00	148.70
Average time period for a batch release	4.29	33.05	18.62
Minimum time period for a batch release	0.62	0.02	0.40
July - December			
Number of batch releases	45	18	23
Total time period for batch releases	1647.21	35.77	165.66
Maximum time period for a batch release	168.00	15.82	132.30
Average time period for a batch release	36.60	1.99	7.20
Minimum time period for a batch release	0.03	0.48	0.73
January - December			
Number of batch releases	65	55	46
Total time period for batch releases	1732.94	1258.77	594.04
Maximum time period for a batch release	168.00	168.00	148.70
Average time period for a batch release	26.66	22.89	12.91
Minimum time period for a batch release	0.03	0.02	0.40

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	6.56E-02	7.20E-02	1.79E-01	2.03E-01	5.20E-01	3.54E+01
2. Average release rate for period	µCi/sec	8.44E-03	9.15E-03	2.26E-02	2.55E-02	1.65E-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	<LLD	<LLD	<LLD	1.33E-06	1.33E-06	3.32E+01
2. Average release rate for period	µCi/sec	<LLD	<LLD	<LLD	1.67E-07	4.22E-08	
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	<LLD	<LLD	<LLD	3.18E-04	3.18E-04	3.43E+01
2. Average release rate for period	µCi/sec	<LLD	<LLD	<LLD	4.00E-05	1.01E-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	8.13E+01	1.55E+01	4.39E+02	2.17E+02	7.53E+02	3.85E+01
2. Average release rate for period	µCi/sec	1.05E+01	1.97E+00	5.52E+01	2.73E+01	2.39E+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 Table40.							
(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	<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	<LLD	<LLD	<LLD	<LLD
2. Iodines						
I-131	Ci	<LLD	<LLD	<LLD	1.11E-06	1.11E-06
I-132	Ci	<LLD	<LLD	<LLD	2.10E-04	2.10E-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	<LLD	<LLD	<LLD	2.12E-04	2.12E-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	3.96E-05	3.96E-05
Co-60	Ci	<LLD	<LLD	<LLD	4.78E-05	4.78E-05
Cr-51	Ci	<LLD	<LLD	<LLD	1.13E-04	1.13E-04
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	2.12E-06	2.12E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	2.04E-06	2.04E-06
Os-191	Ci	<LLD	<LLD	<LLD	1.65E-06	1.65E-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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	<LLD	<LLD	2.06E-04	2.06E-04
4.Tritium						
H-3	Ci	2.86E+01	1.55E+01	1.98E+01	3.97E+01	1.04E+02

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	6.54E-02	7.12E-02	1.78E-01	3.98E-02	3.54E-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	2.08E-04	2.08E-04
Xe-133	Ci	2.80E-04	7.48E-04	1.18E-03	1.62E-01	1.64E-01
Xe-133m	Ci	<LLD	<LLD	<LLD	1.26E-03	1.26E-03
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	6.56E-02	7.20E-02	1.79E-01	2.03E-01	5.20E-01
2. Iodines						
I-131	Ci	<LLD	<LLD	<LLD	2.18E-07	2.18E-07
I-132	Ci	<LLD	<LLD	<LLD	7.77E-06	7.77E-06
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	7.99E-06	7.99E-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	1.96E-06	1.96E-06
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	8.12E-08	8.12E-08
Co-58	Ci	<LLD	<LLD	<LLD	2.19E-05	2.19E-05
Co-60	Ci	<LLD	<LLD	<LLD	1.28E-05	1.28E-05
Cr-51	Ci	<LLD	<LLD	<LLD	7.03E-05	7.03E-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	2.07E-06	2.07E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	2.86E-06	2.86E-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	1.17E-06	1.17E-06
Total	Ci	<LLD	<LLD	<LLD	1.13E-04	1.13E-04
4.Tritium						
H-3	Ci	5.27E+01	7.92E-03	4.19E+02	1.78E+02	6.49E+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	6.54E-02	7.12E-02	1.78E-01	3.98E-02	3.54E-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	2.08E-04	2.08E-04
Xe-133	Ci	2.80E-04	7.48E-04	1.18E-03	1.62E-01	1.64E-01
Xe-133m	Ci	<LLD	<LLD	<LLD	1.26E-03	1.26E-03
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	6.56E-02	7.20E-02	1.79E-01	2.03E-01	5.20E-01
2. Iodines						
I-131	Ci	<LLD	<LLD	<LLD	1.33E-06	1.33E-06
I-132	Ci	<LLD	<LLD	<LLD	2.18E-04	2.18E-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	<LLD	<LLD	<LLD	2.20E-04	2.20E-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	1.96E-06	1.96E-06
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	8.12E-08	8.12E-08
Co-58	Ci	<LLD	<LLD	<LLD	6.14E-05	6.14E-05
Co-60	Ci	<LLD	<LLD	<LLD	6.06E-05	6.06E-05
Cr-51	Ci	<LLD	<LLD	<LLD	1.84E-04	1.84E-04
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	4.18E-06	4.18E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	4.90E-06	4.90E-06
Os-191	Ci	<LLD	<LLD	<LLD	1.65E-06	1.65E-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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	1.17E-06	1.17E-06
Total	Ci	<LLD	<LLD	<LLD	3.20E-04	3.20E-04
Total > 8 days	Ci	<LLD	<LLD	<LLD	3.18E-04	3.18E-04
4. Tritium						
H-3	Ci	8.13E+01	1.55E+01	4.39E+02	2.17E+02	7.53E+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	1.44E-04	1.57E-04	3.92E-04	1.00E-04	7.93E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.88E-03	3.14E-03	7.85E-03	2.00E-03	7.93E-03
Beta Air Dose	mrad	5.09E-05	5.56E-05	1.39E-04	8.79E-05	3.33E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	5.09E-04	5.56E-04	1.39E-03	8.79E-04	1.67E-03
Maximum Organ Dose (excluding skin)	mrem	2.87E-02	2.87E-02	1.36E-01	6.96E-02	2.43E-01
Age		Child	Child	Teen	Teen	Teen
Organ		Bone	Bone	T. Body	Lung	Lung
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	3.83E-01	3.83E-01	1.82E+00	9.28E-01	1.62E+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	8.66E-02	2.59E+00	5.45E-02	1.89E-01	2.92E+00	3.54E+01
2. Average release rate for period	µCi/sec	1.11E-02	3.29E-01	6.86E-03	2.37E-02	9.26E-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	<LLD	3.72E-05	<LLD	<LLD	3.72E-05	3.32E+01
2. Average release rate for period	µCi/sec	<LLD	4.73E-06	<LLD	<LLD	1.18E-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	9.46E-07	2.58E-04	2.93E-06	<LLD	2.62E-04	3.43E+01
2. Average release rate for period	µCi/sec	1.22E-07	3.28E-05	3.68E-07	<LLD	8.31E-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	4.40E+02	1.96E+02	3.07E+01	2.04E+01	6.87E+02	3.85E+01
2. Average release rate for period	µCi/sec	5.66E+01	2.49E+01	3.86E+00	2.56E+00	2.18E+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	1.57E+00	<LLD	<LLD	1.57E+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	1.57E+00	<LLD	<LLD	1.57E+00
2. Iodines						
I-131	Ci	<LLD	3.72E-05	<LLD	<LLD	3.72E-05
I-132	Ci	<LLD	7.44E-04	<LLD	<LLD	7.44E-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	<LLD	7.81E-04	<LLD	<LLD	7.81E-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	<LLD	6.22E-05	2.93E-06	<LLD	6.51E-05
Co-60	Ci	9.46E-07	5.10E-05	<LLD	<LLD	5.19E-05
Cr-51	Ci	<LLD	1.09E-04	<LLD	<LLD	1.09E-04
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	1.73E-05	<LLD	<LLD	1.73E-05
Os-191	Ci	<LLD	3.10E-06	<LLD	<LLD	3.10E-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	<LLD	<LLD	<LLD	<LLD	<LLD
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	7.19E-06	<LLD	<LLD	7.19E-06
Total	Ci	9.46E-07	2.50E-04	2.93E-06	<LLD	2.54E-04
4. Tritium						
H-3	Ci	1.64E+01	2.73E+01	3.07E+01	2.03E+01	9.46E+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	6.93E-02	1.12E-01	4.61E-02	1.55E-01	3.83E-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	1.71E-02	8.72E-01	8.39E-03	3.27E-02	9.31E-01
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	2.09E-04	3.23E-02	<LLD	6.92E-04	3.32E-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	8.66E-02	1.02E+00	5.45E-02	1.89E-01	1.35E+00
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 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	7.47E-06	<LLD	<LLD	7.47E-06
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	4.05E-07	<LLD	<LLD	4.05E-07
Co-60	Ci	<LLD	7.42E-06	<LLD	<LLD	7.42E-06
Cr-51	Ci	<LLD	1.06E-07	<LLD	<LLD	1.06E-07
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	1.10E-07	<LLD	<LLD	1.10E-07
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	1.93E-07	<LLD	<LLD	1.93E-07
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	1.57E-05	<LLD	<LLD	1.57E-05
4. Tritium						
H-3	Ci	4.23E+02	1.68E+02	1.64E-02	1.09E-01	5.92E+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	6.93E-02	1.12E-01	4.61E-02	1.55E-01	3.83E-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	1.71E-02	2.45E+00	8.39E-03	3.27E-02	2.50E+00
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	2.09E-04	3.23E-02	<LLD	6.92E-04	3.32E-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	8.66E-02	2.59E+00	5.45E-02	1.89E-01	2.92E+00
2. Iodines						
I-131	Ci	<LLD	3.72E-05	<LLD	<LLD	3.72E-05
I-132	Ci	<LLD	7.44E-04	<LLD	<LLD	7.44E-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	<LLD	7.81E-04	<LLD	<LLD	7.81E-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	7.47E-06	<LLD	<LLD	7.47E-06
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	6.26E-05	2.93E-06	<LLD	6.55E-05
Co-60	Ci	9.46E-07	5.84E-05	<LLD	<LLD	5.93E-05
Cr-51	Ci	<LLD	1.09E-04	<LLD	<LLD	1.09E-04
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	1.10E-07	<LLD	<LLD	1.10E-07
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	1.75E-05	<LLD	<LLD	1.75E-05
Os-191	Ci	<LLD	3.10E-06	<LLD	<LLD	3.10E-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	<LLD	<LLD	<LLD	<LLD	<LLD
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	7.19E-06	<LLD	<LLD	7.19E-06
Total	Ci	9.46E-07	2.66E-04	2.93E-06	<LLD	2.70E-04
Total > 8 days	Ci	9.46E-07	2.58E-04	2.93E-06	<LLD	2.62E-04
4. Tritium						
H-3	Ci	4.40E+02	1.96E+02	3.07E+01	2.04E+01	6.87E+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	1.63E-04	4.89E-04	1.08E-04	3.65E-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	%	3.26E-03	9.77E-03	2.16E-03	7.29E-03	1.12E-02
Beta Air Dose	mrad	6.33E-05	1.00E-03	4.10E-05	1.40E-04	1.25E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	6.33E-04	1.00E-02	4.10E-04	1.40E-03	6.24E-03
Maximum Organ Dose (excluding skin)	mrem	1.44E-01	6.67E-02	3.04E-02	3.04E-02	2.36E-01
Age		Teen	Teen	Child	Child	Teen
Organ		Lung	Thyroid	Bone	Bone	Thyroid
ODCM Req. 4.2 Limit	%	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	1.93E+00	8.89E-01	4.05E-01	4.05E-01	1.57E+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 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	5.18E-02	8.32E-02	5.45E-02	1.08E-01	2.97E-01	3.54E+01
2. Average release rate for period	µCi/sec	6.66E-03	1.06E-02	6.86E-03	1.35E-02	9.42E-03	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
B. Iodine 131							
1. Total Iodine 131	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	3.32E+01
2. Average release rate for period	µCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	
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	3.83E-07	2.07E-06	1.92E-06	<LLD	4.37E-06	3.43E+01
2. Average release rate for period	µCi/sec	4.93E-08	2.64E-07	2.41E-07	<LLD	1.39E-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	8.59E+01	1.30E+02	1.34E+02	3.08E+01	3.81E+02	3.85E+01
2. Average release rate for period	µCi/sec	1.11E+01	1.65E+01	1.69E+01	3.87E+00	1.21E+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	<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	<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	<LLD	<LLD	<LLD	<LLD
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 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	3.83E-07	<LLD	<LLD	<LLD	3.83E-07
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	1.92E-06	<LLD	1.92E-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	2.07E-06	<LLD	<LLD	2.07E-06
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	5.16E-06	5.16E-06
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	3.83E-07	2.07E-06	1.92E-06	5.16E-06	9.53E-06
4. Tritium						
H-3	Ci	2.81E+01	2.45E+01	3.07E+01	3.08E+01	1.14E+02

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	5.18E-02	8.32E-02	5.45E-02	1.08E-01	2.97E-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	5.18E-02	8.32E-02	5.45E-02	1.08E-01	2.97E-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	3.78E-05	<LLD	<LLD	3.78E-05
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	3.78E-05	<LLD	<LLD	3.78E-05
4. Tritium						
H-3	Ci	5.79E+01	1.05E+02	1.03E+02	2.51E-02	2.67E+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	5.18E-02	8.32E-02	5.45E-02	1.08E-01	2.97E-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	5.18E-02	8.32E-02	5.45E-02	1.08E-01	2.97E-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 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	3.78E-05	<LLD	<LLD	3.78E-05
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	3.83E-07	<LLD	<LLD	<LLD	3.83E-07
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	1.92E-06	<LLD	1.92E-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	2.07E-06	<LLD	<LLD	2.07E-06
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	5.16E-06	5.16E-06
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	3.83E-07	3.99E-05	1.92E-06	5.16E-06	4.73E-05
Total > 8 days	Ci	3.83E-07	2.07E-06	1.92E-06	<LLD	4.37E-06
4. Tritium						
H-3	Ci	8.59E+01	1.30E+02	1.34E+02	3.08E+01	3.81E+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	1.36E-04	2.19E-04	1.43E-04	2.83E-04	7.80E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.72E-03	4.37E-03	2.86E-03	5.65E-03	7.80E-03
Beta Air Dose	mrad	4.80E-05	7.71E-05	5.05E-05	9.96E-05	2.75E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	4.80E-04	7.71E-04	5.05E-04	9.96E-04	1.38E-03
Maximum Organ Dose (excluding skin)	mrem	3.56E-02	5.14E-02	5.29E-02	3.43E-02	1.56E-01
Age		Teen	Teen	Teen	Child	Teen
Organ		Lung	T. Body	Lung	Bone	Lung
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	4.74E-01	6.86E-01	7.06E-01	4.57E-01	1.04E+00

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

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	<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	1.57E+00	<LLD	<LLD	1.57E+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	1.57E+00	<LLD	<LLD	1.57E+00
2. Iodines						
I-131	Ci	<LLD	3.72E-05	<LLD	1.11E-06	3.83E-05
I-132	Ci	<LLD	7.44E-04	<LLD	2.10E-04	9.55E-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	<LLD	7.81E-04	<LLD	2.12E-04	9.93E-04

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	3.83E-07	6.22E-05	2.93E-06	3.96E-05	1.05E-04
Co-60	Ci	9.46E-07	5.10E-05	<LLD	4.78E-05	9.97E-05
Cr-51	Ci	<LLD	1.09E-04	<LLD	1.13E-04	2.23E-04
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	2.12E-06	2.12E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	1.73E-05	1.92E-06	2.04E-06	2.13E-05
Os-191	Ci	<LLD	3.10E-06	<LLD	1.65E-06	4.75E-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	2.07E-06	<LLD	<LLD	2.07E-06
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	5.16E-06	5.16E-06
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	7.19E-06	<LLD	<LLD	7.19E-06
Total	Ci	1.33E-06	2.52E-04	4.84E-06	2.12E-04	4.70E-04
4. Tritium						
H-3	Ci	7.31E+01	6.74E+01	8.11E+01	9.07E+01	3.12E+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	1.86E-01	2.67E-01	2.79E-01	3.03E-01	1.03E+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	2.08E-04	2.08E-04
Xe-133	Ci	1.74E-02	8.73E-01	9.57E-03	1.95E-01	1.09E+00
Xe-133m	Ci	<LLD	<LLD	<LLD	1.26E-03	1.26E-03
Xe-135	Ci	2.09E-04	3.23E-02	<LLD	6.92E-04	3.32E-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	2.04E-01	1.17E+00	2.88E-01	4.99E-01	2.16E+00
2. Iodines						
I-131	Ci	<LLD	<LLD	<LLD	2.18E-07	2.18E-07
I-132	Ci	<LLD	<LLD	<LLD	7.77E-06	7.77E-06
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	7.99E-06	7.99E-06

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	4.52E-05	<LLD	1.96E-06	4.72E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	8.12E-08	8.12E-08
Co-58	Ci	<LLD	4.05E-07	<LLD	2.19E-05	2.23E-05
Co-60	Ci	<LLD	7.42E-06	<LLD	1.28E-05	2.02E-05
Cr-51	Ci	<LLD	1.06E-07	<LLD	7.03E-05	7.04E-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	1.10E-07	<LLD	2.07E-06	2.18E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	1.93E-07	<LLD	2.86E-06	3.06E-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	1.17E-06	1.17E-06
Total	Ci	<LLD	5.35E-05	<LLD	1.13E-04	1.67E-04
4. Tritium						
H-3	Ci	5.34E+02	2.74E+02	5.23E+02	1.78E+02	1.51E+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	1.86E-01	2.67E-01	2.79E-01	3.03E-01	1.03E+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	2.08E-04	2.08E-04
Xe-133	Ci	1.74E-02	2.45E+00	9.57E-03	1.95E-01	2.67E+00
Xe-133m	Ci	<LLD	<LLD	<LLD	1.26E-03	1.26E-03
Xe-135	Ci	2.09E-04	3.23E-02	<LLD	6.92E-04	3.32E-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	2.04E-01	2.75E+00	2.88E-01	4.99E-01	3.74E+00
2. Iodines						
I-131	Ci	<LLD	3.72E-05	<LLD	1.33E-06	3.85E-05
I-132	Ci	<LLD	7.44E-04	<LLD	2.18E-04	9.63E-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	<LLD	7.81E-04	<LLD	2.20E-04	1.00E-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	4.52E-05	<LLD	1.96E-06	4.72E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	8.12E-08	8.12E-08
Co-58	Ci	3.83E-07	6.26E-05	2.93E-06	6.14E-05	1.27E-04
Co-60	Ci	9.46E-07	5.84E-05	<LLD	6.06E-05	1.20E-04
Cr-51	Ci	<LLD	1.09E-04	<LLD	1.84E-04	2.93E-04
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	1.10E-07	<LLD	4.18E-06	4.29E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	1.75E-05	1.92E-06	4.90E-06	2.43E-05
Os-191	Ci	<LLD	3.10E-06	<LLD	1.65E-06	4.75E-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	2.07E-06	<LLD	<LLD	2.07E-06
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	5.16E-06	5.16E-06
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	7.19E-06	<LLD	1.17E-06	8.36E-06
Total	Ci	1.33E-06	3.06E-04	4.84E-06	3.25E-04	6.37E-04
Total > 8 days	Ci	1.33E-06	2.60E-04	4.84E-06	3.18E-04	5.84E-04
4. Tritium						
H-3	Ci	6.07E+02	3.41E+02	6.04E+02	2.69E+02	1.82E+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	<LLD	<LLD
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	1.57E+00	<LLD	1.57E+00
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-137	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	1.57E+00	<LLD	1.57E+00
2. Iodines					
I-131	Ci	1.11E-06	3.72E-05	<LLD	3.83E-05
I-132	Ci	2.10E-04	7.44E-04	<LLD	9.55E-04
I-133	Ci	<LLD	<LLD	<LLD	<LLD
I-134	Ci	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	2.12E-04	7.81E-04	<LLD	9.93E-04

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	3.96E-05	6.51E-05	3.83E-07	1.05E-04
Co-60	Ci	4.78E-05	5.19E-05	<LLD	9.97E-05
Cr-51	Ci	1.13E-04	1.09E-04	<LLD	2.23E-04
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	2.12E-06	<LLD	<LLD	2.12E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	2.04E-06	1.73E-05	1.92E-06	2.13E-05
Os-191	Ci	1.65E-06	3.10E-06	<LLD	4.75E-06
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
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	2.07E-06	2.07E-06
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	5.16E-06	5.16E-06
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	7.19E-06	<LLD	7.19E-06
Total	Ci	2.06E-04	2.54E-04	9.53E-06	4.70E-04
4. Tritium					
H-3	Ci	1.04E+02	9.46E+01	1.14E+02	3.12E+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	3.54E-01	3.83E-01	2.97E-01	1.03E+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	2.08E-04	<LLD	<LLD	2.08E-04
Xe-133	Ci	1.64E-01	9.31E-01	<LLD	1.09E+00
Xe-133m	Ci	1.26E-03	<LLD	<LLD	1.26E-03
Xe-135	Ci	<LLD	3.32E-02	<LLD	3.32E-02
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-137	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138		<LLD	<LLD	<LLD	<LLD
Total	Ci	5.20E-01	1.35E+00	2.97E-01	2.16E+00
2. Iodines					
I-131	Ci	2.18E-07	<LLD	<LLD	2.18E-07
I-132	Ci	7.77E-06	<LLD	<LLD	7.77E-06
I-133	Ci	<LLD	<LLD	<LLD	<LLD
I-134	Ci	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	7.99E-06	<LLD	<LLD	7.99E-06

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	1.96E-06	7.47E-06	3.78E-05	4.72E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	8.12E-08	<LLD	<LLD	8.12E-08
Co-58	Ci	2.19E-05	4.05E-07	<LLD	2.23E-05
Co-60	Ci	1.28E-05	7.42E-06	<LLD	2.02E-05
Cr-51	Ci	7.03E-05	1.06E-07	<LLD	7.04E-05
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	2.07E-06	1.10E-07	<LLD	2.18E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	2.86E-06	1.93E-07	<LLD	3.06E-06
Os-191	Ci	<LLD	<LLD	<LLD	<LLD
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	1.17E-06	<LLD	<LLD	1.17E-06
Total	Ci	1.13E-04	1.57E-05	3.78E-05	1.67E-04
4. Tritium					
H-3	Ci	6.49E+02	5.92E+02	2.67E+02	1.51E+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	3.54E-01	3.83E-01	2.97E-01	1.03E+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	2.08E-04	<LLD	<LLD	2.08E-04
Xe-133	Ci	1.64E-01	2.50E+00	<LLD	2.67E+00
Xe-133m	Ci	1.26E-03	<LLD	<LLD	1.26E-03
Xe-135	Ci	<LLD	3.32E-02	<LLD	3.32E-02
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-137	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	5.20E-01	2.92E+00	2.97E-01	3.74E+00
2. Iodines					
I-131	Ci	1.33E-06	3.72E-05	<LLD	3.85E-05
I-132	Ci	2.18E-04	7.44E-04	<LLD	9.63E-04
I-133	Ci	<LLD	<LLD	<LLD	<LLD
I-134	Ci	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	2.20E-04	7.81E-04	<LLD	1.00E-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	1.96E-06	7.47E-06	3.78E-05	4.72E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	8.12E-08	<LLD	<LLD	8.12E-08
Co-58	Ci	6.14E-05	6.55E-05	3.83E-07	1.27E-04
Co-60	Ci	6.06E-05	5.93E-05	<LLD	1.20E-04
Cr-51	Ci	1.84E-04	1.09E-04	<LLD	2.93E-04
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	4.18E-06	1.10E-07	<LLD	4.29E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	4.90E-06	1.75E-05	1.92E-06	2.43E-05
Os-191	Ci	1.65E-06	3.10E-06	<LLD	4.75E-06
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
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	2.07E-06	2.07E-06
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	5.16E-06	5.16E-06
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	1.17E-06	7.19E-06	<LLD	8.36E-06
Total	Ci	3.20E-04	2.70E-04	4.73E-05	6.37E-04
Total > 8 days	Ci	3.18E-04	2.62E-04	4.37E-06	5.84E-04
4. Tritium					
H-3	Ci	7.53E+02	6.87E+02	3.81E+02	1.82E+03

Table 40: Estimation of Total Percent Error				
Fission & Act gases	I-131	Particulates	Tritium	Error
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	Plate-out 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				

The estimated total error is calculated as follows:

Total Percent Error = $(E_1^2 + E_2^2 + E_3^2 + \cdots + E_n^2)^{\frac{1}{2}}$

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 values in Table 40 (%) were used for error calculations.

Table 41: Effluent Monitoring Instrumentation Out of Service Greater Than 30 Days				
Unit	Instrument	Dates of Inoperability	Cause of Inoperability	Explanation
All	1JGRNFIT33, Waste Gas Exhaust Duct Flow Indicator Transmitter	9/28/2017-Present	Failed testing (CR 17-13603)	Indicator does not show numerical value. FIT33 calibrator sent off site for repairs. CR 18-04254 identified calibrator was damaged upon receipt. Calibrator repair under Purchase Request 1403814

Table 42:

Solid Waste Summary

1.0 Solid Waste Shipped Offsite in 2017 For Burial or Disposal (not irradiated fuel)

Table 1.a: Volume and Curies Shipped - Spent Resin, Filters, Sludge, Evaporator Bottoms, etc.				
Waste Class	Volume (ft^3)	Volume(m^3)	Curies Shipped	Percent Error
A	2.11E+03	5.99E+01	5.78E+00	2.50E+01
B	0.00E+0	0.00E+0	0.00E+0	2.50E+01
C	1.51E+02	4.27E+00	2.18E+01	2.50E+01
All	2.26E+03	6.41E+01	2.75E+01	2.50E+01

Table 1.b: Volume and Curies Shipped - Dry Active Waste				
Waste Class	Volume (ft^3)	Volume(m^3)	Curies Shipped	Percent Error
A	2.44E+04	6.88E+02	1.18E+00	2.50E+01
B	0.00E+0	0.00E+0	0.00E+0	2.50E+01
C	0.00E+0	0.00E+0	0.00E+0	2.50E+01
All	2.44E+04	6.88E+02	1.18E+00	2.50E+01

Table 1.c: Volume and Curies Shipped - Irradiated Components				
Waste Class	Volume (ft^3)	Volume(m^3)	Curies Shipped	Percent Error
A	3.48E+01	9.86E-01	2.38E-01	2.50E+01
B	0.00E+0	0.00E+0	0.00E+0	2.50E+01
C	0.00E+0	0.00E+0	0.00E+0	2.50E+01
All	3.48E+01	9.86E-01	2.38E-01	2.50E+01

Table 1.d: Volume and Curies Shipped - Other Waste (Oil)				
Waste Class	Volume (ft^3)	Volume(m^3)	Curies Shipped	Percent Error
A	1.99E+02	5.65E+00	1.17E-05	2.50E+01
B	0.00E+0	0.00E+0	0.00E+0	2.50E+01
C	0.00E+0	0.00E+0	0.00E+0	2.50E+01
All	1.99E+02	5.65E+00	1.17E-05	2.50E+01

Table 1.e Summary of All Waste Shipped				
Waste Class	Volume (ft^3)	Volume(m^3))	Curies Shipped	Percent Error
A	2.61E+04	7.36E+02	7.19E+00	2.50E+01
B	0.00E+0	0.00E+0	0.00E+0	2.50E+01
C	1.51E+02	4.27E+00	2.18E+01	2.50E+01
All	2.62E+04	7.40E+02	2.89E+01	2.50E+01

2.0 Estimate of major nuclide composition

Table 2.a Spent Resin, Filters, Sludge, Evaporator bottoms, etc.			
Nuclide	Percent Abundance	Curies	Estimated Total Percent Error
Ag-108m	9.01E-04	2.48E-04	2.50E+01
Ag-110m	2.86E-03	7.88E-04	2.50E+01
Am-241	3.72E-03	1.02E-03	2.50E+01
Am-243	3.96E-05	1.09E-05	2.50E+01
Be-7	7.08E-12	1.95E-12	2.50E+01
C-14	4.72E+00	1.30E+00	2.50E+01
Ce-141	2.42E-03	6.67E-04	2.50E+01
Ce-144	2.69E-02	7.41E-03	2.50E+01
Cm-242	9.81E-08	2.70E-08	2.50E+01
Cm-243	7.44E-03	2.05E-03	2.50E+01
Co-57	3.16E-02	8.69E-03	2.50E+01
Co-58	2.30E-01	6.32E-02	2.50E+01
Co-60	2.49E+01	6.84E+00	2.50E+01
Cr-51	5.85E-04	1.61E-04	2.50E+01
Cs-134	2.42E-02	6.65E-03	2.50E+01
Cs-137	6.32E-01	1.74E-01	2.50E+01
Fe-55	1.93E+01	5.30E+00	2.50E+01
Fe-59	4.87E-05	1.34E-05	2.50E+01
H-3	4.82E+00	1.33E+00	2.50E+01
Hf-181	6.61E-26	1.82E-26	2.50E+01
I-129	2.37E-01	6.54E-02	2.50E+01
Mn-54	4.06E-01	1.12E-01	2.50E+01
Nb-94	2.29E-06	6.30E-07	2.50E+01

Table 2.a Continued			
Nuclide	Percent Abundance	Curies	Estimated Total Percent Error
Nb-95	1.84E-03	5.08E-04	2.50E+01
Ni-59	8.63E-02	2.38E-02	2.50E+01
Ni-63	4.39E+01	1.21E+01	2.50E+01
Np-237	2.89E-09	7.96E-10	2.50E+01
Pu-238	8.44E-03	2.32E-03	2.50E+01
Pu-239	4.33E-03	1.19E-03	2.50E+01
Pu-240	2.55E-10	7.03E-11	2.50E+01
Pu-241	1.80E-01	4.95E-02	2.50E+01
Pu-242	1.08E-04	2.97E-05	2.50E+01
Ru-103	2.95E-27	8.11E-28	2.50E+01
Ru-106	2.49E-07	6.85E-08	2.50E+01
Sb-124	1.27E-03	3.49E-04	2.50E+01
Sb-125	3.27E-01	8.99E-02	2.50E+01
Sn-113	1.51E-03	4.17E-04	2.50E+01
Sr-89	1.05E-06	2.89E-07	2.50E+01
Sr-90	3.51E-02	9.65E-03	2.50E+01
Tc-99	1.63E-01	4.50E-02	2.50E+01
Te-123m	3.85E-07	1.06E-07	2.50E+01
U-233	2.00E-09	5.51E-10	2.50E+01
U-235	3.20E-05	8.80E-06	2.50E+01
Zn-65	8.13E-03	2.24E-03	2.50E+01
Zr-95	2.24E-03	6.16E-04	2.50E+01
	Total	2.75E+01	

Table 2.b Dry Active Waste			
Nuclide	Percent Abundance	Curies	Estimated Total Percent Error
Ag-110m	1.73E-03	2.03E-05	2.50E+01
Am-241	2.02E-05	2.37E-07	2.50E+01
C-14	1.66E+00	1.95E-02	2.50E+01
Ce-144	1.32E-01	1.55E-03	2.50E+01
Cm-242	1.16E-04	1.36E-06	2.50E+01
Cm-243	5.19E-05	6.11E-07	2.50E+01
Co-57	7.81E-02	9.18E-04	2.50E+01
Co-58	1.50E+01	1.77E-01	2.50E+01
Co-60	2.18E+01	2.57E-01	2.50E+01
Cr-51	1.85E+01	2.18E-01	2.50E+01
Cs-137	1.41E-01	1.65E-03	2.50E+01
Fe-55	1.46E+01	1.72E-01	2.50E+01
Fe-59	5.87E-01	6.89E-03	2.50E+01
H-3	2.56E+00	3.00E-02	2.50E+01
Hf-181	6.70E-02	7.88E-04	2.50E+01
I-129	1.39E-01	1.63E-03	2.50E+01
Mn-54	2.33E+00	2.74E-02	2.50E+01
Nb-95	8.84E+00	1.04E-01	2.50E+01
Ni-63	2.40E+00	2.82E-02	2.50E+01
Pu-238	4.24E-05	4.98E-07	2.50E+01
Pu-239	4.43E-06	5.20E-08	2.50E+01
Pu-241	8.94E-05	1.05E-06	2.50E+01
Sb-124	2.66E-01	3.12E-03	2.50E+01
Sb-125	8.56E-01	1.01E-02	2.50E+01
Sc-46	4.85E-03	5.70E-05	2.50E+01
Sn-113	3.27E-01	3.84E-03	2.50E+01
Sr-89	1.19E-02	1.40E-04	2.50E+01
Sr-90	8.89E-03	1.04E-04	2.50E+01
Tc-99	5.06E-02	5.95E-04	2.50E+01
Te-123m	1.11E-01	1.31E-03	2.50E+01
Zn-65	2.10E-01	2.46E-03	2.50E+01
Zr-95	9.25E+00	1.09E-01	2.50E+01
	Total	1.18E+00	

Table 2.c Irradiated Components			
Nuclide	Percent Abundance	Curies	Estimated Total Percent Error
Am-241	1.55E-04	3.69E-07	2.50E+01
C-14	6.17E-02	1.47E-04	2.50E+01
Ce-144	2.72E-03	6.49E-06	2.50E+01
Cm-242	1.73E-07	4.12E-10	2.50E+01
Cm-243	4.37E-05	1.04E-07	2.50E+01
Co-57	6.85E-03	1.63E-05	2.50E+01
Co-58	6.99E-01	1.67E-03	2.50E+01
Co-60	7.65E+01	1.82E-01	2.50E+01
Cr-51	1.40E-01	3.34E-04	2.50E+01
Cs-137	2.68E-03	6.39E-06	2.50E+01
Fe-55	1.45E+01	3.45E-02	2.50E+01
Fe-59	1.42E-02	3.39E-05	2.50E+01
H-3	1.72E-02	4.11E-05	2.50E+01
Hf-181	1.08E-03	2.57E-06	2.50E+01
I-129	1.60E-04	3.82E-07	2.50E+01
Mn-54	3.18E-01	7.59E-04	2.50E+01
Nb-94	5.93E-04	1.41E-06	2.50E+01
Nb-95	9.82E-02	2.34E-04	2.50E+01
Ni-59	7.31E-02	1.74E-04	2.50E+01
Ni-63	5.41E+00	1.29E-02	2.50E+01
Pu-238	5.36E-05	1.28E-07	2.50E+01
Pu-239	1.16E-04	2.76E-07	2.50E+01
Pu-241	1.54E-03	3.66E-06	2.50E+01
Sb-124	1.84E-03	4.39E-06	2.50E+01
Sb-125	2.63E-02	6.27E-05	2.50E+01
Sc-46	3.05E-05	7.27E-08	2.50E+01
Sn-113	1.15E-02	2.75E-05	2.50E+01
Sr-90	2.21E-03	5.28E-06	2.50E+01
Tc-99	4.29E-04	1.02E-06	2.50E+01
Te-123m	3.08E-04	7.34E-07	2.50E+01
Zn-65	1.94E+00	4.62E-03	2.50E+01
Zr-95	2.31E-01	5.51E-04	2.50E+01
	Total	2.38E-01	

Table 2.d Other Waste: Oil			
Nuclide	Percent Abundance	Curies	Estimated Total Percent Error
Co-60	1.30E-01	1.40E-06	2.50E+01
Cs-137	4.61E-01	4.96E-06	2.50E+01
H-3	7.25E+01	7.80E-04	2.50E+01
I-129	1.09E-01	1.17E-06	2.50E+01
Sb-125	4.94E-01	5.32E-06	2.50E+01
Tc-99	2.63E+01	2.83E-04	2.50E+01
	Total	1.08E-03	

Table 2.e Summary of All Waste Shipped			
Nuclide	Percent Abundance	Curies	Estimated Total Percent Error
Ag-108m	8.57E-04	2.48E-04	2.50E+01
Ag-110m	2.79E-03	8.08E-04	2.50E+01
Am-241	3.54E-03	1.02E-03	2.50E+01
Am-243	3.76E-05	1.09E-05	2.50E+01
Be-7	6.74E-12	1.95E-12	2.50E+01
C-14	4.55E+00	1.32E+00	2.50E+01
Ce-141	2.30E-03	6.67E-04	2.50E+01
Ce-144	3.10E-02	8.96E-03	2.50E+01
Cm-242	4.80E-06	1.39E-06	2.50E+01
Cm-243	7.07E-03	2.05E-03	2.50E+01
Co-57	3.32E-02	9.62E-03	2.50E+01
Co-58	8.34E-01	2.42E-01	2.50E+01
Co-60	2.52E+01	7.28E+00	2.50E+01
Cr-51	7.54E-01	2.18E-01	2.50E+01
Cs-134	2.30E-02	6.65E-03	2.50E+01
Cs-137	6.06E-01	1.76E-01	2.50E+01
Cs-137	1.71E-05	4.96E-06	2.50E+01
Fe-55	1.90E+01	5.51E+00	2.50E+01
Fe-59	2.40E-02	6.94E-03	2.50E+01
H-3	4.69E+00	1.36E+00	2.50E+01
Hf-181	2.73E-03	7.90E-04	2.50E+01
I-129	2.31E-01	6.70E-02	2.50E+01
Mn-54	4.83E-01	1.40E-01	2.50E+01
Nb-94	7.06E-06	2.04E-06	2.50E+01
Nb-95	3.62E-01	1.05E-01	2.50E+01
Ni-59	8.27E-02	2.39E-02	2.50E+01
Ni-63	4.19E+01	1.21E+01	2.50E+01
Np-237	2.75E-09	7.96E-10	2.50E+01
Pu-238	8.03E-03	2.33E-03	2.50E+01
Pu-239	4.12E-03	1.19E-03	2.50E+01
Pu-240	2.43E-10	7.03E-11	2.50E+01
Pu-241	1.71E-01	4.95E-02	2.50E+01
Pu-242	1.03E-04	2.97E-05	2.50E+01
Ru-103	2.80E-27	8.11E-28	2.50E+01

Table 2.e Continued			
Nuclide	Percent Abundance	Curies	Estimated Total Percent Error
Ru-106	2.37E-07	6.85E-08	2.50E+01
Sb-124	1.20E-02	3.48E-03	2.50E+01
Sb-125	3.46E-01	1.00E-01	2.50E+01
Sc-46	1.97E-04	5.71E-05	2.50E+01
Sn-113	1.48E-02	4.29E-03	2.50E+01
Sr-89	4.85E-04	1.40E-04	2.50E+01
Sr-90	3.37E-02	9.76E-03	2.50E+01
Tc-99	1.58E-01	4.59E-02	2.50E+01
Te-123m	4.53E-03	1.31E-03	2.50E+01
U-233	1.90E-09	5.51E-10	2.50E+01
U-235	3.04E-05	8.80E-06	2.50E+01
Zn-65	3.22E-02	9.32E-03	2.50E+01
Zr-95	3.80E-01	1.10E-01	2.50E+01
	Total	2.89E+01	

3.0 Irradiated Fuel Shipments: (NONE)

4.0 Supplemental Information

Table 4.a Shipment Mode and Location		
Number of Shipments	Mode of Transport	Destination
32	Highway	Energy Solutions, UT
2	Highway	Energy Solutions, TN
2	Highway	Waste Control Specialists, TX

Table 4.b Shipping Container Characteristics			
Number of Containers	Type of Waste	Container Type	Solidification Agent
1	Dry Active Waste	10' Sealand	None
20	Dry Active Waste	20' Sealand	None
6	Dry Active Waste	20' Intermodal	None
1	Dry Active Waste	ES-210	None
1	Other: Oil	ES-210	None
10	Concentrates	ES-210	None
2	Dry Active Waste	CS-210	None
2	Filters	PLB-120	None
3	Irradiated Components	80 gallon Drum	None
1	Filters	100HIC55	None
1	Filters	85 gallon Drum	None

Table 4.c Container Volume in m^3 by Waste Class			
Type of waste	Waste Class A	Waste Class B	Waste Class C
Spent Resin, Filters, Sludge, Evaporator bottoms, etc.	5.99E+01	0	4.27E+00
Dry Active Waste	6.88E+02	0	0
Irradiated Components	9.86E-01	0	0
Other Waste: Oil	5.65E+00	0	0

Table 4.d Container Activity in Ci by Waste Class			
Type of waste	Waste Class A	Waste Class B	Waste Class C
Spent Resin, Filters, Sludge, Evaporator bottoms, etc.	5.57E+00	0	2.17E+01
Dry Active Waste	1.15E+00	0	0
Irradiated Components	1.60E-01	0	0
Other Waste: Oil	1.17E-05	0	0

4.e. Principle Radionuclides: Located in Section 2, Tables 2.a.-2.e.

Table 4.f Source of Waste and Processing Employed	
Type of waste	Source
Spent Resin, Filters, Sludge, Evaporator bottoms, etc.	Mechanical filters-no processing, concentrates as a liquid-no processing
Dry Active Waste	non-compacted dry active waste - no processing employed
Irradiated Components	Activated material - no processing employed
Other Waste: Oil	Oil - no processing employed

Table 4.g Type of Container	
Type of waste	Type of Container
Spent Resin, Filters, Sludge, Evaporator bottoms, etc.	(3) Type A Containers, (10) General Design Containers
Dry Active Waste	(2) Type A Containers, (19) General Design Containers
Irradiated Components	(1) Type A Container
Other Waste: Oil	(1) General Design Container

Table 4.h Solidification Agent or Absorbent	
Type of waste	Solidification Agent/Absorbent
Spent Resin, Filters, Sludge, Evaporator bottoms, etc.	No solidification agents or absorbents used to process material
Dry Active Waste	No solidification agents or absorbents used to process material
Irradiated Components	No solidification agents or absorbents used to process material
Other Waste: Oil	No solidification agents or absorbents used to process material

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 2017. 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. The JFD tables were produced using the wind speed and direction measured at 35 foot elevation. Based on the data collected, the atmospheric stability class corresponding to the seven Pasquill stability categories, as well as the 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 (delta T).

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 2017 Joint Frequency Distribution (JFD) shows a typical year. Of the 8760 hours available, 409 hours of data were lost due to data logger overwriting and the meteorological tower being out of service for an equipment upgrade. As a result, the effective data recovery for 2017 was 95.3 percent.

The 35-foot mean wind speed was 6.3 mph. South west winds averaged higher speeds with the most frequent speeds between 8.51-11.50 mph.

Stability class summary:

Stability class E and F, (stable categories) 31.69%.
Stability class G, (extremely stable) 26.63%.
Stability class A, B, C, (unstable categories) 20.59%.
Stability class D, (neutral category) 21.09%.

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD: 1/01/2017 TO 3/31/2017

*** 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: 0.75 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	2	0	0	0	2	1	1	0	0	0	1	0	0	7
6.51- 8.50	0	0	0	2	1	6	0	0	1	0	0	0	0	1	0	0	11
8.51-11.50	0	0	0	0	0	1	0	0	0	2	4	1	2	0	4	0	14
11.51-14.50	0	0	0	0	0	0	0	0	0	0	4	1	10	3	2	0	20
14.51-20.50	0	0	3	0	0	0	0	0	1	2	1	0	4	2	1	1	15
>20.50	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	1	4
TOTAL	0	0	4	4	1	7	0	2	3	5	11	2	16	7	7	2	71

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	0	1	0	0	0	0	1	2
4.51- 5.50	0	0	0	1	0	0	0	0	4	3	1	3	2	0	1	0	15
5.51- 6.50	0	0	1	1	0	0	1	1	1	1	1	1	3	1	0	0	12
6.51- 8.50	0	1	1	3	0	1	1	0	2	2	2	1	1	0	0	1	16
8.51-11.50	0	0	1	1	1	0	0	0	0	1	5	1	2	0	1	1	14
11.51-14.50	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	4
14.51-20.50	0	0	0	2	0	0	0	0	0	0	0	0	1	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	1	3	9	1	1	2	2	7	7	11	6	9	2	2	3	66

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	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2
3.51- 4.50	2	1	0	1	0	0	0	2	1	2	2	1	1	2	3	1	19
4.51- 5.50	2	1	2	2	0	1	0	0	4	7	3	1	1	3	2	5	34
5.51- 6.50	1	4	3	5	1	0	0	0	4	2	2	0	0	2	0	0	24
6.51- 8.50	1	4	6	1	2	0	1	0	0	0	2	1	0	0	0	0	18
8.51-11.50	0	0	4	0	1	0	0	0	0	0	0	4	0	1	1	0	11
11.51-14.50	0	0	1	0	1	0	0	0	0	0	1	1	1	2	1	0	8
14.51-20.50	0	1	0	1	0	0	0	0	0	0	0	1	1	1	0	0	5
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	6	11	17	10	5	1	1	2	9	11	10	10	4	11	7	6	121

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2017 TO 3/31/2017

*** 1ST 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: 0.75 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	1	2	1	1	0	1	1	0	1	4	2	2	0	3	19
2.51- 3.50	9	6	5	4	2	0	2	2	6	5	12	4	7	10	5	9	88
3.51- 4.50	6	6	11	5	2	1	2	0	8	13	5	2	4	7	4	8	84
4.51- 5.50	9	8	8	5	1	0	0	0	7	9	11	3	1	5	2	1	70
5.51- 6.50	5	10	6	3	0	1	1	2	1	0	4	2	3	1	0	1	40
6.51- 8.50	6	4	14	1	3	2	6	0	3	7	6	4	4	1	2	3	66
8.51-11.50	4	0	1	8	3	3	4	5	0	7	13	3	2	2	4	1	60
11.51-14.50	0	0	1	2	4	0	0	0	0	2	2	2	4	3	3	0	23
14.51-20.50	0	0	1	0	1	0	0	0	2	5	2	6	2	2	2	1	24
>20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
TOTAL	39	34	48	30	17	8	15	10	28	49	56	30	29	35	22	27	477

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	1	1
1.51- 2.50	2	2	1	1	0	0	1	1	0	1	2	8	5	2	2	6	34
2.51- 3.50	6	4	2	0	0	0	1	2	1	1	3	5	6	11	11	6	59
3.51- 4.50	8	1	5	1	0	0	1	2	1	3	5	2	2	5	4	11	51
4.51- 5.50	2	4	6	2	0	0	3	1	4	2	5	6	1	1	3	2	42
5.51- 6.50	5	0	1	0	0	0	1	0	4	1	2	0	1	2	4	3	24
6.51- 8.50	4	4	3	2	1	0	1	7	7	3	7	2	1	6	2	3	53
8.51-11.50	3	3	1	1	4	1	1	3	2	4	4	3	1	2	3	4	40
11.51-14.50	0	0	1	1	2	2	4	2	1	5	1	3	1	6	3	4	36
14.51-20.50	0	0	3	0	2	0	2	1	4	2	0	5	0	11	4	1	35
>20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3
TOTAL	30	18	23	8	9	3	15	19	24	22	31	34	18	47	36	41	378

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	1	0	0	0	0	0	0	1
1.51- 2.50	2	2	0	1	0	0	0	0	1	0	2	2	5	4	5	3	27
2.51- 3.50	9	3	3	3	1	1	1	1	2	2	0	6	4	8	17	19	80
3.51- 4.50	8	6	1	1	0	1	0	0	1	3	3	1	6	6	13	16	66
4.51- 5.50	8	3	1	0	1	0	0	0	1	2	3	6	3	5	7	10	50
5.51- 6.50	2	6	1	1	0	0	0	0	3	0	4	2	3	4	8	8	42
6.51- 8.50	3	1	1	0	0	0	0	0	0	0	9	6	7	4	5	12	48
8.51-11.50	3	4	1	0	1	0	0	0	0	0	2	1	2	1	1	9	25
11.51-14.50	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	5	9
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	36	25	9	6	3	2	1	1	8	9	24	24	30	32	56	82	348

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2017 TO 3/31/2017

*** 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: 0.75 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	2	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	5
1.51- 2.50	8	5	2	0	0	1	0	0	0	3	1	4	4	5	15	8	56
2.51- 3.50	28	25	3	1	2	0	0	0	0	2	0	4	4	16	31	44	160
3.51- 4.50	64	24	4	1	0	0	0	0	0	0	2	2	1	7	19	65	189
4.51- 5.50	71	20	4	1	0	0	0	0	1	0	2	0	2	1	9	31	142
5.51- 6.50	32	19	1	0	0	0	0	0	0	1	2	1	0	1	0	15	72
6.51- 8.50	20	21	2	0	0	0	0	0	0	1	0	0	0	0	1	12	57
8.51-11.50	9	6	1	0	0	0	0	0	0	0	0	0	0	0	0	1	17
11.51-14.50	1	0	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	235	120	17	3	2	1	0	0	1	7	7	12	12	31	75	176	699

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	2	0	0	0	0	0	0	0	0	1	0	1	1	1	0	1	7
1.51- 2.50	12	9	4	4	1	2	1	2	2	4	6	18	16	13	22	20	136
2.51- 3.50	52	38	14	8	5	1	4	5	9	10	15	20	21	45	64	78	389
3.51- 4.50	88	38	21	9	2	2	3	4	11	21	18	8	14	27	43	102	411
4.51- 5.50	92	36	21	11	2	1	3	1	21	23	25	19	10	15	24	49	353
5.51- 6.50	45	39	13	12	1	1	3	5	14	6	15	6	10	12	12	27	221
6.51- 8.50	34	35	27	9	7	9	9	7	13	13	26	14	13	12	10	31	269
8.51-11.50	19	13	9	10	10	5	5	8	2	14	28	13	9	6	14	16	181
11.51-14.50	2	0	4	4	7	2	4	3	1	8	10	7	16	15	9	9	101
14.51-20.50	0	1	7	3	3	0	2	1	7	9	3	12	8	16	7	3	82
>20.50	0	0	1	0	0	0	0	0	0	1	4	0	0	3	0	1	10
TOTAL	346	209	121	70	38	23	34	36	80	110	150	118	118	165	205	337	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: 6.0 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
3.29	3.06	5.60	22.08	17.50	16.11	32.36

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	4	4	1	7	0	2	3	5	11	2	16	7	7	2	0
B	0	1	3	9	1	1	2	2	7	7	11	6	9	2	2	3	0
C	6	11	17	10	5	1	1	2	9	11	10	10	4	11	7	6	0
D	39	34	48	30	17	8	15	10	28	49	56	30	29	35	22	27	0
E	30	18	23	8	9	3	15	19	24	22	31	34	18	47	36	41	0
F	36	25	9	6	3	2	1	1	8	9	24	24	30	32	56	82	0
G	235	120	17	3	2	1	0	0	1	7	7	12	12	31	75	176	0
TOTAL	346	209	121	70	38	23	34	36	80	110	150	118	118	165	205	337	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2017 TO 6/30/2017

*** 2ND 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: 0.75 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	1	0	0	0	1	0	1	1	0	1	1	0	0	0	0	6
4.51- 5.50	1	0	0	0	2	0	1	6	1	2	3	0	3	1	0	1	21
5.51- 6.50	0	0	0	1	3	1	2	2	6	6	7	3	2	0	0	0	33
6.51- 8.50	0	2	0	2	1	2	2	5	11	14	21	19	6	1	1	0	87
8.51-11.50	1	0	0	0	2	0	0	1	6	22	37	28	10	7	1	3	118
11.51-14.50	0	0	0	0	0	0	0	0	3	16	29	12	6	2	0	5	73
14.51-20.50	0	0	0	0	0	0	0	1	2	11	23	3	5	4	0	0	49
>20.50	0	0	0	0	0	0	0	0	1	6	1	0	1	0	1	0	10
TOTAL	2	3	0	3	8	4	5	16	31	77	122	66	33	15	3	9	397

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	1	0	0	0	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	0	0	0	0	0	1	2	2	1	0	0	0	1	0	0	7
4.51- 5.50	0	0	0	0	0	0	1	2	10	3	4	1	0	2	2	0	25
5.51- 6.50	1	1	0	1	0	1	1	0	5	3	3	4	1	0	1	1	23
6.51- 8.50	0	0	2	0	1	0	3	2	5	3	11	7	5	2	1	1	43
8.51-11.50	0	0	0	0	2	3	0	0	0	5	11	5	3	1	0	0	30
11.51-14.50	1	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	5
14.51-20.50	0	0	0	0	0	0	0	0	0	1	2	3	1	2	0	0	9
>20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
TOTAL	2	1	2	1	4	4	6	6	22	16	35	20	11	8	5	2	145

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	1	1	0	0	0	0	0	0	1	0	3
3.51- 4.50	0	0	1	0	0	1	1	0	1	5	2	0	0	1	0	0	12
4.51- 5.50	1	0	0	0	0	0	1	3	7	4	7	3	1	0	0	0	27
5.51- 6.50	1	2	0	1	0	1	1	4	10	3	9	0	1	1	1	1	36
6.51- 8.50	0	1	1	0	2	3	0	0	1	4	12	6	5	2	0	0	37
8.51-11.50	0	0	1	0	0	3	0	2	0	2	7	3	1	3	0	0	22
11.51-14.50	0	0	0	0	0	0	0	1	0	1	5	2	1	0	0	0	10
14.51-20.50	0	0	0	0	0	0	0	0	0	1	6	2	1	0	0	0	10
>20.50	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
TOTAL	2	3	3	1	2	8	4	11	19	21	49	16	10	7	2	1	159

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2017 TO 6/30/2017

*** 2ND 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: 0.75 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																	1
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
1.51- 2.50	1	0	3	2	0	0	3	1	8	2	1	0	3	0	3	2	29
2.51- 3.50	4	2	2	0	3	2	6	9	6	6	4	2	1	1	3	1	52
3.51- 4.50	0	1	3	1	4	3	3	7	10	3	7	3	5	1	0	2	53
4.51- 5.50	0	3	2	0	2	2	4	8	15	9	6	2	4	1	1	0	59
5.51- 6.50	0	0	1	3	2	1	0	0	9	6	7	2	4	0	0	0	35
6.51- 8.50	0	0	0	0	0	4	0	2	2	3	9	7	6	0	0	0	33
8.51-11.50	0	0	0	0	0	1	0	0	1	2	13	5	5	1	1	2	31
11.51-14.50	0	0	0	0	1	0	0	0	0	5	3	5	3	2	1	0	20
14.51-20.50	0	0	0	0	0	0	0	0	0	6	13	6	3	3	2	0	33
>20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
TOTAL	5	6	11	6	12	13	16	27	51	42	65	32	34	9	11	8	349

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	1	1	0	2
1.51- 2.50	2	1	0	1	1	0	1	1	0	2	0	1	0	2	1	2	15
2.51- 3.50	1	1	0	2	1	1	0	1	1	2	3	0	1	4	0	1	19
3.51- 4.50	0	1	1	0	1	1	0	0	1	6	5	3	0	0	1	0	20
4.51- 5.50	0	1	0	0	0	1	2	1	6	8	6	5	3	2	0	0	35
5.51- 6.50	0	0	1	0	0	0	0	0	1	3	8	11	3	1	2	0	30
6.51- 8.50	2	0	1	0	1	0	0	0	0	15	16	12	3	5	0	0	55
8.51-11.50	0	0	0	0	0	0	0	0	3	15	34	17	7	8	2	0	86
11.51-14.50	0	0	0	0	0	0	0	0	1	9	43	18	5	5	2	0	83
14.51-20.50	2	0	0	0	0	0	0	0	1	8	14	8	0	0	0	3	36
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	7	4	3	3	4	3	3	3	14	68	129	75	22	28	9	6	381

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	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
1.51- 2.50	2	5	0	0	2	0	1	1	1	1	1	1	1	2	2	1	21
2.51- 3.50	2	0	1	0	2	1	0	3	1	1	4	2	2	2	6	1	28
3.51- 4.50	1	0	2	0	0	1	0	1	0	7	5	7	3	2	4	5	38
4.51- 5.50	1	0	2	0	0	0	0	0	3	5	6	7	7	5	3	2	41
5.51- 6.50	0	0	0	0	0	0	1	1	2	5	12	5	5	4	5	1	41
6.51- 8.50	1	2	1	0	0	0	0	1	1	10	23	23	11	3	6	2	84
8.51-11.50	0	0	0	0	0	0	0	1	0	1	17	15	5	5	4	3	51
11.51-14.50	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
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	8	8	6	0	4	2	2	8	8	32	69	60	34	23	30	15	309

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2017 TO 6/30/2017

*** 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: 0.75 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	1	0	1	1	0	0	0	0	0	0	0	0	2	0	2	0	7
1.51- 2.50	7	2	1	1	1	0	0	1	0	1	5	5	3	2	2	6	37
2.51- 3.50	8	12	3	2	1	1	2	1	4	6	2	10	7	5	4	17	85
3.51- 4.50	10	15	3	5	3	2	1	6	5	2	3	5	11	2	5	10	88
4.51- 5.50	22	11	9	3	2	1	2	5	4	4	6	2	3	5	3	9	91
5.51- 6.50	10	13	6	3	1	2	1	1	0	2	1	1	1	2	0	7	51
6.51- 8.50	3	7	3	1	0	1	0	0	0	2	8	4	2	1	5	4	41
8.51-11.50	0	2	0	1	0	0	0	0	0	2	2	0	0	0	1	1	9
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	61	62	26	17	8	7	6	14	13	19	27	27	29	17	22	54	409

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	1
.76- 1.50	2	1	1	1	0	0	0	0	0	1	0	0	2	1	3	1	13
1.51- 2.50	12	8	4	4	4	0	5	4	9	6	7	7	7	6	8	11	102
2.51- 3.50	15	15	6	4	8	5	9	15	12	15	13	14	11	12	14	20	188
3.51- 4.50	11	18	10	6	8	9	6	17	20	24	23	19	19	7	10	17	224
4.51- 5.50	25	15	13	3	6	4	11	25	46	35	38	20	21	16	9	12	299
5.51- 6.50	12	16	8	9	6	6	6	8	33	28	47	26	17	8	9	10	249
6.51- 8.50	6	12	8	3	5	10	5	10	20	51	100	78	38	14	13	7	380
8.51-11.50	1	2	1	1	4	7	0	4	10	49	121	73	31	25	9	9	347
11.51-14.50	1	0	0	0	1	0	0	1	4	32	84	37	16	9	3	5	193
14.51-20.50	2	0	0	0	0	0	0	1	3	27	58	22	10	9	2	3	137
>20.50	0	0	0	0	0	0	0	0	1	7	5	0	1	0	2	0	16
TOTAL	87	87	51	31	42	41	42	85	158	275	496	296	173	107	82	95	2149

TOTAL NUMBER OF OBSERVATIONS: 2184
TOTAL NUMBER OF VALID OBSERVATIONS: 2149
TOTAL NUMBER OF MISSING OBSERVATIONS: 35
PERCENT DATA RECOVERY FOR THIS PERIOD: 98.4 %
MEAN WIND SPEED FOR THIS PERIOD: 7.5 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
18.47	6.75	7.40	16.24	17.73	14.38	19.03

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	2	3	0	3	8	4	5	16	31	77	122	66	33	15	3	9	0
B	2	1	2	1	4	4	6	6	22	16	35	20	11	8	5	2	0
C	2	3	3	1	2	8	4	11	19	21	49	16	10	7	2	1	0
D	5	6	11	6	12	13	16	27	51	42	65	32	34	9	11	8	1
E	7	4	3	3	4	3	3	3	14	68	129	75	22	28	9	6	0
F	8	8	6	0	4	2	2	8	8	32	69	60	34	23	30	15	0
G	61	62	26	17	8	7	6	14	13	19	27	27	29	17	22	54	0
TOTAL	87	87	51	31	42	41	42	85	158	275	496	296	173	107	82	95	1

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2017 TO 6/30/2017

*** 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: 0.75 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	1	0	0	0	1	0	1	1	0	1	1	0	0	0	0	6
4.51- 5.50	1	0	0	0	2	0	1	6	1	2	3	0	3	1	0	1	21
5.51- 6.50	0	0	0	3	3	1	2	4	7	7	7	3	2	1	0	0	40
6.51- 8.50	0	2	0	4	2	8	2	5	12	14	21	19	6	2	1	0	98
8.51-11.50	1	0	0	0	2	1	0	1	6	24	41	29	12	7	5	3	132
11.51-14.50	0	0	0	0	0	0	0	0	3	16	33	13	16	5	2	5	93
14.51-20.50	0	0	3	0	0	0	0	1	3	13	24	3	9	6	1	1	64
>20.50	0	0	1	0	0	0	0	0	1	6	3	0	1	0	1	1	14
TOTAL	2	3	4	7	9	11	5	18	34	82	133	68	49	22	10	11	468

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	1	0	0	0	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	0	0	0	0	0	1	2	2	1	1	0	0	1	0	1	9
4.51- 5.50	0	0	0	1	0	0	1	2	14	6	5	4	2	2	3	0	40
5.51- 6.50	1	1	1	2	0	1	2	1	6	4	4	5	4	1	1	1	35
6.51- 8.50	0	1	3	3	1	1	4	2	7	5	13	8	6	2	1	2	59
8.51-11.50	0	0	1	1	3	3	0	0	0	6	16	6	5	1	1	1	44
11.51-14.50	1	0	0	1	0	0	0	1	0	0	4	0	1	1	0	0	9
14.51-20.50	0	0	0	2	0	0	0	0	0	1	2	3	2	2	0	0	12
>20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
TOTAL	2	2	5	10	5	5	8	8	29	23	46	26	20	10	7	5	211

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	1	0	0	0	1	1	0	0	0	1	0	0	1	0	5
3.51- 4.50	2	1	1	1	0	1	1	2	2	7	4	1	1	3	3	1	31
4.51- 5.50	3	1	2	2	0	1	1	3	11	11	10	4	2	3	2	5	61
5.51- 6.50	2	6	3	6	1	1	1	4	14	5	11	0	1	3	1	1	60
6.51- 8.50	1	5	7	1	4	3	1	0	1	4	14	7	5	2	0	0	55
8.51-11.50	0	0	5	0	1	3	0	2	0	2	7	7	1	4	1	0	33
11.51-14.50	0	0	1	0	1	0	0	1	0	1	6	3	2	2	1	0	18
14.51-20.50	0	1	0	1	0	0	0	0	0	1	6	3	2	1	0	0	15
>20.50	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
TOTAL	8	14	20	11	7	9	5	13	28	32	59	26	14	18	9	7	280

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2017 TO 6/30/2017

*** 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: 0.75 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																	1
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
1.51- 2.50	1	0	4	4	1	1	3	2	9	2	2	4	5	2	3	5	48
2.51- 3.50	13	8	7	4	5	2	8	11	12	11	16	6	8	11	8	10	140
3.51- 4.50	6	7	14	6	6	4	5	7	18	16	12	5	9	8	4	10	137
4.51- 5.50	9	11	10	5	3	2	4	8	22	18	17	5	5	6	3	1	129
5.51- 6.50	5	10	7	6	2	2	1	2	10	6	11	4	7	1	0	1	75
6.51- 8.50	6	4	14	1	3	6	6	2	5	10	15	11	10	1	2	3	99
8.51-11.50	4	0	1	8	3	4	4	5	1	9	26	8	7	3	5	3	91
11.51-14.50	0	0	1	2	5	0	0	0	0	7	5	7	7	5	4	0	43
14.51-20.50	0	0	1	0	1	0	0	0	2	11	15	12	5	5	4	1	57
>20.50	0	0	0	0	0	0	0	0	0	1	2	0	0	2	0	0	5
TOTAL	44	40	59	36	29	21	31	37	79	91	121	62	63	44	33	35	826

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	1	1	1	3
1.51- 2.50	4	3	1	2	1	0	2	2	0	3	2	9	5	4	3	8	49
2.51- 3.50	7	5	2	2	1	1	1	3	2	3	6	5	7	15	11	7	78
3.51- 4.50	8	2	6	1	1	1	1	2	2	9	10	5	2	5	5	11	71
4.51- 5.50	2	5	6	2	0	1	5	2	10	10	11	11	4	3	3	2	77
5.51- 6.50	5	0	2	0	0	0	1	0	5	4	10	11	4	3	6	3	54
6.51- 8.50	6	4	4	2	2	0	1	7	7	18	23	14	4	11	2	3	108
8.51-11.50	3	3	1	1	4	1	1	3	5	19	38	20	8	10	5	4	126
11.51-14.50	0	0	1	1	2	2	4	2	2	14	44	21	6	11	5	4	119
14.51-20.50	2	0	3	0	2	0	2	1	5	10	14	13	0	11	4	4	71
>20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3
TOTAL	37	22	26	11	13	6	18	22	38	90	160	109	40	75	45	47	759

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	1	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4
1.51- 2.50	4	7	0	1	2	0	1	1	2	1	3	3	6	6	7	4	48
2.51- 3.50	11	3	4	3	3	2	1	4	3	3	4	8	6	10	23	20	108
3.51- 4.50	9	6	3	1	0	2	0	1	1	10	8	8	9	8	17	21	104
4.51- 5.50	9	3	3	0	1	0	0	0	4	7	9	13	10	10	10	12	91
5.51- 6.50	2	6	1	1	0	0	1	1	5	5	16	7	8	8	13	9	83
6.51- 8.50	4	3	2	0	0	0	0	1	1	10	32	29	18	7	11	14	132
8.51-11.50	3	4	1	0	1	0	0	1	0	1	19	16	7	6	5	12	76
11.51-14.50	1	0	1	0	0	0	0	0	0	2	2	0	0	0	0	5	11
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	44	33	15	6	7	4	3	9	16	41	93	84	64	55	86	97	657

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2017 TO 6/30/2017

*** 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: 0.75 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	3	0	1	1	0	0	0	0	0	0	0	1	3	1	2	0	12
1.51- 2.50	15	7	3	1	1	1	0	1	0	4	6	9	7	7	17	14	93
2.51- 3.50	36	37	6	3	3	1	2	1	4	8	2	14	11	21	35	61	245
3.51- 4.50	74	39	7	6	3	2	1	6	5	2	5	7	12	9	24	75	277
4.51- 5.50	93	31	13	4	2	1	2	5	5	4	8	2	5	6	12	40	233
5.51- 6.50	42	32	7	3	1	2	1	1	0	3	3	2	1	3	0	22	123
6.51- 8.50	23	28	5	1	0	1	0	0	0	3	8	4	2	1	6	16	98
8.51-11.50	9	8	1	1	0	0	0	0	0	2	2	0	0	0	1	2	26
11.51-14.50	1	0	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	296	182	43	20	10	8	6	14	14	26	34	39	41	48	97	230	1108

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	1
.76- 1.50	4	1	1	1	0	0	0	0	0	2	0	1	3	2	3	2	20
1.51- 2.50	24	17	8	8	5	2	6	6	11	10	13	25	23	19	30	31	238
2.51- 3.50	67	53	20	12	13	6	13	20	21	25	28	34	32	57	78	98	577
3.51- 4.50	99	56	31	15	10	11	9	21	31	45	41	27	33	34	53	119	635
4.51- 5.50	117	51	34	14	8	5	14	26	67	58	63	39	31	31	33	61	652
5.51- 6.50	57	55	21	21	7	7	9	13	47	34	62	32	27	20	21	37	470
6.51- 8.50	40	47	35	12	12	19	14	17	33	64	126	92	51	26	23	38	649
8.51-11.50	20	15	10	11	14	12	5	12	12	63	149	86	40	31	23	25	528
11.51-14.50	3	0	4	4	8	2	4	4	5	40	94	44	32	24	12	14	294
14.51-20.50	2	1	7	3	3	0	2	2	10	36	61	34	18	25	9	6	219
>20.50	0	0	1	0	0	0	0	0	1	8	9	0	1	3	2	1	26
TOTAL	433	296	172	101	80	64	76	121	238	385	646	414	291	272	287	432	4309

TOTAL NUMBER OF OBSERVATIONS: 4344
TOTAL NUMBER OF VALID OBSERVATIONS: 4309
TOTAL NUMBER OF MISSING OBSERVATIONS: 35
PERCENT DATA RECOVERY FOR THIS PERIOD: 99.2 %
MEAN WIND SPEED FOR THIS PERIOD: 6.8 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
10.86	4.90	6.50	19.17	17.61	15.25	25.71

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	2	3	4	7	9	11	5	18	34	82	133	68	49	22	10	11	0
B	2	2	5	10	5	5	8	8	29	23	46	26	20	10	7	5	0
C	8	14	20	11	7	9	5	13	28	32	59	26	14	18	9	7	0
D	44	40	59	36	29	21	31	37	79	91	121	62	63	44	33	35	1
E	37	22	26	11	13	6	18	22	38	90	160	109	40	75	45	47	0
F	44	33	15	6	7	4	3	9	16	41	93	84	64	55	86	97	0
G	296	182	43	20	10	8	6	14	14	26	34	39	41	48	97	230	0
TOTAL	433	296	172	101	80	64	76	121	238	385	646	414	291	272	287	432	1

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2017 TO 9/30/2017

*** 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: 0.75 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	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
4.51- 5.50	0	0	0	0	0	1	0	0	1	0	1	2	1	0	0	0	6
5.51- 6.50	0	0	1	0	1	0	0	1	4	1	1	3	0	2	2	1	17
6.51- 8.50	0	0	0	0	1	1	2	2	2	16	12	10	4	1	0	0	51
8.51-11.50	0	0	0	1	2	2	0	0	2	11	21	19	11	0	2	0	71
11.51-14.50	0	0	0	1	2	0	0	1	0	7	12	3	2	0	0	0	28
14.51-20.50	0	0	0	0	0	0	0	0	0	2	7	1	0	0	0	0	10
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	1	1	2	6	4	2	4	9	37	54	38	18	4	4	1	185

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	0	0	1	0	0	0	0	1	0	1	0	0	4
4.51- 5.50	1	0	0	0	0	1	0	1	0	3	0	1	0	0	0	0	7
5.51- 6.50	0	0	0	0	2	0	2	3	3	8	10	0	1	0	0	1	30
6.51- 8.50	1	0	0	3	7	2	5	7	19	18	17	8	1	3	0	1	92
8.51-11.50	1	0	0	1	5	4	0	2	2	9	8	8	1	1	2	1	45
11.51-14.50	0	0	0	1	4	0	0	0	0	1	4	0	0	0	0	0	10
14.51-20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	0	0	6	18	7	8	13	24	39	41	18	3	5	2	3	190

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	1	0	1	0	0	0	2
3.51- 4.50	0	0	0	0	0	0	1	1	0	2	2	0	0	1	0	2	9
4.51- 5.50	0	0	1	1	2	3	5	3	5	8	3	1	2	0	1	0	35
5.51- 6.50	0	0	2	1	2	2	2	5	15	9	8	5	2	1	1	0	55
6.51- 8.50	0	0	0	1	5	6	6	7	19	14	12	6	5	1	0	0	82
8.51-11.50	0	0	0	1	2	1	0	0	2	2	10	3	1	1	0	1	24
11.51-14.50	0	0	0	0	0	0	0	0	0	0	5	3	0	0	0	0	8
14.51-20.50	0	0	0	0	1	0	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	0	3	4	12	12	14	16	41	35	41	18	11	4	2	3	216

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2017 TO 9/30/2017

*** 3RD 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: 0.75 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	1	0	0	1	0	0	0	0	0	2
1.51- 2.50	0	0	1	1	1	1	1	0	2	2	1	0	0	1	1	0	12
2.51- 3.50	2	1	5	1	1	4	2	5	7	7	7	5	3	0	1	0	51
3.51- 4.50	4	3	2	1	2	2	2	6	14	14	5	4	3	0	3	1	66
4.51- 5.50	1	0	5	3	1	7	5	4	15	13	18	5	5	0	0	3	85
5.51- 6.50	0	1	1	1	5	2	3	10	19	11	13	7	3	1	0	0	77
6.51- 8.50	0	0	6	1	1	8	12	6	12	10	8	3	5	1	0	1	74
8.51-11.50	0	0	2	4	6	8	1	2	2	9	14	3	3	2	1	0	57
11.51-14.50	1	1	2	2	7	0	0	1	0	4	16	4	1	2	0	0	41
14.51-20.50	0	0	0	1	8	1	1	0	2	2	8	3	0	0	0	0	26
>20.50	0	0	1	1	0	1	0	0	0	0	2	0	0	0	0	0	5
TOTAL	8	6	25	16	32	34	27	35	73	72	93	34	23	7	6	5	496

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	1	0	0	0	0	0	1	0	0	1	0	1	0	4
1.51- 2.50	2	0	0	2	1	0	0	1	1	2	2	5	5	4	3	0	28
2.51- 3.50	3	2	0	1	1	1	2	2	7	3	6	5	8	5	2	0	48
3.51- 4.50	3	3	1	3	3	4	3	4	2	4	6	7	5	2	0	3	53
4.51- 5.50	0	1	0	1	1	0	3	2	4	6	10	7	2	0	1	1	39
5.51- 6.50	0	2	3	3	3	2	4	3	4	11	17	6	3	0	2	0	63
6.51- 8.50	1	0	5	6	4	3	5	5	10	18	17	12	3	2	1	3	95
8.51-11.50	0	0	6	5	11	3	6	5	9	8	28	13	4	7	2	0	107
11.51-14.50	0	1	3	3	8	1	5	1	1	12	6	2	0	2	2	1	48
14.51-20.50	1	0	0	2	14	1	0	2	0	3	7	2	0	0	0	0	32
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	10	9	18	27	46	15	28	25	38	68	99	59	31	22	14	8	517

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	1	2	1	0	4
1.51- 2.50	1	1	1	0	0	1	2	0	1	4	0	0	5	1	0	0	17
2.51- 3.50	1	2	2	1	3	2	4	1	3	6	10	8	8	0	1	2	54
3.51- 4.50	2	3	4	1	2	2	1	0	6	7	7	9	4	2	6	0	56
4.51- 5.50	1	1	3	3	3	1	2	3	5	4	12	9	3	2	1	4	57
5.51- 6.50	1	1	3	4	1	1	0	1	2	8	13	7	4	0	0	3	49
6.51- 8.50	2	3	4	4	2	1	1	1	2	5	21	6	4	4	1	1	62
8.51-11.50	1	1	2	1	0	0	0	1	2	7	4	3	0	0	1	1	24
11.51-14.50	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3
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	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	9	12	19	16	11	8	12	7	21	41	67	42	29	11	11	11	327

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2017 TO 9/30/2017

*** 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: 0.75 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	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
1.51- 2.50	2	3	1	0	1	0	3	0	1	1	1	3	3	2	3	2	26
2.51- 3.50	5	8	3	0	2	2	2	4	2	3	3	5	9	7	5	8	68
3.51- 4.50	7	5	2	2	2	4	6	3	3	4	3	5	4	4	6	7	67
4.51- 5.50	7	6	2	1	2	5	0	2	2	2	2	5	0	2	2	9	49
5.51- 6.50	1	5	5	0	1	2	3	3	2	0	2	0	0	0	1	4	29
6.51- 8.50	0	1	1	1	1	1	0	1	0	1	1	0	0	0	0	1	9
8.51-11.50	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
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	24	29	16	4	10	14	14	13	10	11	12	18	16	15	17	31	254

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	1	0	1	1	0	0	1	0	1	1	0	2	2	2	0	13
1.51- 2.50	5	4	3	3	3	2	6	1	5	9	4	8	13	8	7	2	83
2.51- 3.50	11	13	10	3	7	9	10	12	19	19	27	23	29	12	9	10	223
3.51- 4.50	16	15	9	8	9	12	14	14	25	31	23	26	16	11	15	13	257
4.51- 5.50	10	8	11	9	9	18	15	15	32	36	46	30	13	4	5	17	278
5.51- 6.50	2	9	15	9	15	9	14	26	49	48	64	28	13	4	6	9	320
6.51- 8.50	4	4	16	16	21	22	31	29	64	82	88	45	22	12	2	7	465
8.51-11.50	3	1	12	13	26	18	7	10	19	46	85	49	20	11	8	3	331
11.51-14.50	1	2	5	8	21	1	7	3	1	24	43	12	3	4	2	1	138
14.51-20.50	1	0	0	3	23	2	1	2	2	7	24	6	0	0	0	0	71
>20.50	0	0	1	2	0	1	0	0	0	0	2	0	0	0	0	0	6
TOTAL	54	57	82	75	135	94	105	113	216	303	407	227	131	68	56	62	2185

TOTAL NUMBER OF OBSERVATIONS: 2208
TOTAL NUMBER OF VALID OBSERVATIONS: 2185
TOTAL NUMBER OF MISSING OBSERVATIONS: 23
PERCENT DATA RECOVERY FOR THIS PERIOD: 99.0 %
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
8.47	8.70	9.89	22.70	23.66	14.97	11.62

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	1	1	2	6	4	2	4	9	37	54	38	18	4	4	1	0
B	3	0	0	6	18	7	8	13	24	39	41	18	3	5	2	3	0
C	0	0	3	4	12	12	14	16	41	35	41	18	11	4	2	3	0
D	8	6	25	16	32	34	27	35	73	72	93	34	23	7	6	5	0
E	10	9	18	27	46	15	28	25	38	68	99	59	31	22	14	8	0
F	9	12	19	16	11	8	12	7	21	41	67	42	29	11	11	11	0
G	24	29	16	4	10	14	14	13	10	11	12	18	16	15	17	31	0
TOTAL	54	57	82	75	135	94	105	113	216	303	407	227	131	68	56	62	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2017 TO 12/31/2017

*** 4TH 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: 0.75 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	1	0	0	0	0	0	0	0	0	0	0	1
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	0	0	0	0	0	0	0	0	0	0	0	1	0	1
6.51- 8.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2
8.51-11.50	0	0	0	1	0	0	0	0	0	7	2	0	0	0	0	1	11
11.51-14.50	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	3
14.51-20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	4
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	1	1	1	0	0	0	9	3	0	0	0	6	1	22

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	1
.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	1	0	0	0	0	0	1
2.51- 3.50	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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	2	0	0	0	1	0	0	0	3
5.51- 6.50	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2
6.51- 8.50	0	0	1	1	1	0	0	1	1	0	1	0	1	0	0	0	7
8.51-11.50	0	0	0	1	3	0	0	0	2	2	2	3	1	0	2	0	16
11.51-14.50	0	0	0	2	2	0	0	0	0	0	2	0	0	0	0	1	7
14.51-20.50	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	3
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	2	5	7	0	0	1	5	2	8	3	3	0	3	1	41

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	4
.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	1	1	0	0	0	0	1	2	0	0	0	1	0	0	7
2.51- 3.50	1	3	0	1	0	0	0	0	1	2	2	0	0	0	0	0	10
3.51- 4.50	0	4	1	1	0	0	0	0	1	0	6	0	0	0	1	1	15
4.51- 5.50	1	1	6	1	1	0	0	1	0	4	3	0	0	0	1	0	19
5.51- 6.50	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0	12
6.51- 8.50	0	1	1	0	4	1	0	0	3	2	2	1	0	0	0	1	16
8.51-11.50	1	0	0	1	3	0	0	0	2	3	5	2	0	0	1	0	18
11.51-14.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
14.51-20.50	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	5
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	5	10	10	6	15	1	1	2	9	14	19	4	1	1	3	2	107

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2017 TO 12/31/2017

*** 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: 0.75 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																	8
.76- 1.50	0	1	0	1	1	0	0	0	0	1	0	1	0	0	1	2	8
1.51- 2.50	3	1	1	2	0	1	3	3	2	6	6	10	4	2	5	2	51
2.51- 3.50	2	8	8	7	1	1	1	5	11	13	22	3	6	5	6	3	102
3.51- 4.50	0	10	12	6	5	0	3	6	14	15	11	4	5	7	2	4	104
4.51- 5.50	1	1	14	9	3	3	2	2	9	5	9	2	0	1	0	2	63
5.51- 6.50	4	2	5	8	2	1	1	0	5	2	2	1	1	2	0	4	40
6.51- 8.50	1	1	2	4	3	2	2	2	4	3	9	5	1	1	0	1	41
8.51-11.50	1	0	0	2	1	0	1	1	1	3	5	0	1	0	0	1	17
11.51-14.50	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
14.51-20.50	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	3
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	12	24	42	39	19	8	13	19	46	48	65	26	18	18	15	19	439

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	4
.76- 1.50	0	0	1	0	0	0	0	1	1	2	2	1	0	1	4	0	13
1.51- 2.50	3	1	1	0	1	0	1	4	0	5	1	2	4	2	2	4	31
2.51- 3.50	2	3	1	1	0	1	0	1	2	3	4	2	2	2	3	3	30
3.51- 4.50	2	4	2	0	0	1	0	0	3	2	4	3	0	0	1	2	24
4.51- 5.50	2	2	0	0	0	0	0	1	0	4	2	2	0	0	2	0	15
5.51- 6.50	0	1	1	0	0	0	0	2	0	2	3	2	2	1	0	0	14
6.51- 8.50	0	0	1	0	0	0	0	1	0	3	3	4	2	4	0	0	18
8.51-11.50	0	0	0	0	0	0	0	0	0	2	3	0	2	2	1	2	12
11.51-14.50	0	0	0	0	0	0	0	0	0	1	2	1	1	3	4	1	13
14.51-20.50	0	0	0	0	0	0	0	0	0	0	1	1	0	5	1	0	8
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	9	11	7	1	1	2	1	10	6	24	25	18	13	20	18	12	182

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	2
.76- 1.50	0	1	1	1	0	0	0	0	1	1	0	1	3	0	0	0	9
1.51- 2.50	2	3	4	1	0	2	0	0	1	1	2	2	4	6	6	6	40
2.51- 3.50	2	3	1	0	0	0	0	0	0	3	4	6	5	2	5	4	35
3.51- 4.50	9	2	1	0	0	0	0	0	0	1	4	2	2	2	2	7	32
4.51- 5.50	5	1	1	1	0	0	0	0	0	0	3	6	3	2	3	4	29
5.51- 6.50	1	1	0	0	0	0	0	1	1	1	1	1	2	1	4	2	16
6.51- 8.50	3	0	0	0	0	0	0	0	0	3	7	4	1	4	4	2	28
8.51-11.50	0	0	0	0	0	0	0	1	0	1	4	2	1	1	1	2	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	22	11	8	3	0	2	0	2	3	11	25	24	21	18	25	27	204

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2017 TO 12/31/2017

*** 4TH 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: 0.75 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																	6
.76- 1.50	4	4	1	2	1	0	0	0	0	1	0	4	4	1	4	1	27
1.51- 2.50	27	28	14	6	3	1	2	2	0	3	4	2	12	9	20	15	148
2.51- 3.50	48	44	6	3	0	2	0	5	4	0	5	5	3	18	25	46	214
3.51- 4.50	74	43	13	2	2	4	0	1	2	3	3	1	1	14	19	36	218
4.51- 5.50	48	23	9	1	0	1	1	0	5	1	2	2	0	2	15	28	138
5.51- 6.50	25	16	3	2	0	1	0	1	1	0	0	0	1	0	5	10	65
6.51- 8.50	13	8	3	1	0	0	1	1	0	0	0	0	0	0	2	12	41
8.51-11.50	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	5
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	241	166	50	17	6	9	4	10	12	9	14	14	21	44	90	149	862

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	25
.76- 1.50	4	6	3	4	2	0	0	1	2	5	2	7	7	2	9	3	57
1.51- 2.50	36	33	21	10	4	5	6	9	4	17	14	16	24	20	33	27	279
2.51- 3.50	55	61	17	12	1	4	1	11	18	21	37	16	16	27	39	56	392
3.51- 4.50	85	63	29	9	7	5	3	7	20	21	28	10	8	23	25	50	393
4.51- 5.50	57	28	30	12	4	4	3	4	16	14	19	12	4	5	21	34	267
5.51- 6.50	31	21	10	12	3	2	2	5	8	6	8	5	7	4	10	16	150
6.51- 8.50	17	10	8	6	9	3	3	5	8	11	22	14	5	9	7	16	153
8.51-11.50	4	0	1	5	7	0	1	2	5	19	21	7	5	3	5	7	92
11.51-14.50	0	0	0	2	5	0	0	0	0	2	5	1	1	3	5	2	26
14.51-20.50	0	0	0	0	7	0	0	0	0	1	3	1	0	5	6	0	23
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	289	222	119	72	49	23	19	44	81	117	159	89	77	101	160	211	1857

TOTAL NUMBER OF OBSERVATIONS: 2208
TOTAL NUMBER OF VALID OBSERVATIONS: 1857
TOTAL NUMBER OF MISSING OBSERVATIONS: 351
PERCENT DATA RECOVERY FOR THIS PERIOD: 84.1 %
MEAN WIND SPEED FOR THIS PERIOD: 4.5 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
1.18	2.21	5.76	23.64	9.80	10.99	46.42

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	0	1	1	1	0	0	0	9	3	0	0	0	6	1	0
B	0	0	2	5	7	0	0	1	5	2	8	3	3	0	3	1	1
C	5	10	10	6	15	1	1	2	9	14	19	4	1	1	3	2	4
D	12	24	42	39	19	8	13	19	46	48	65	26	18	18	15	19	8
E	9	11	7	1	1	2	1	10	6	24	25	18	13	20	18	12	4
F	22	11	8	3	0	2	0	2	3	11	25	24	21	18	25	27	2
G	241	166	50	17	6	9	4	10	12	9	14	14	21	44	90	149	6
TOTAL	289	222	119	72	49	23	19	44	81	117	159	89	77	101	160	211	25

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2017 TO 12/31/2017

*** 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: 0.75 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	1	0	0	0	0	0	0	0	0	0	0	1
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	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
4.51- 5.50	0	0	0	0	0	1	0	0	1	0	1	2	1	0	0	0	6
5.51- 6.50	0	0	1	0	1	0	0	1	4	1	1	3	0	2	3	1	18
6.51- 8.50	0	0	0	0	2	1	2	2	2	16	12	10	4	1	1	0	53
8.51-11.50	0	0	0	2	2	2	0	0	2	18	23	19	11	0	2	1	82
11.51-14.50	0	0	0	1	2	0	0	1	0	8	13	3	2	0	1	0	31
14.51-20.50	0	0	0	0	0	0	0	0	0	3	7	1	0	0	3	0	14
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	1	1	3	7	5	2	4	9	46	57	38	18	4	10	2	207

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	1
.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	1	0	0	0	0	0	1
2.51- 3.50	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	4
4.51- 5.50	1	0	0	0	0	1	0	1	2	3	0	1	1	0	0	0	10
5.51- 6.50	0	0	0	1	2	0	2	3	3	8	11	0	1	0	0	1	32
6.51- 8.50	1	0	1	4	8	2	5	8	20	18	18	8	2	3	0	1	99
8.51-11.50	1	0	0	2	8	4	0	2	4	11	10	11	2	1	4	1	61
11.51-14.50	0	0	0	3	6	0	0	0	0	1	6	0	0	0	0	1	17
14.51-20.50	0	0	0	0	1	0	0	0	0	0	3	0	0	0	1	0	5
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	0	2	11	25	7	8	14	29	41	49	21	6	5	5	4	231

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	4
.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	1	1	0	0	0	0	1	2	0	0	0	1	0	0	7
2.51- 3.50	1	3	0	1	0	0	0	0	1	2	3	0	1	0	0	0	12
3.51- 4.50	0	4	1	1	0	0	1	1	1	2	8	0	0	1	1	3	24
4.51- 5.50	1	1	7	2	3	3	5	4	5	12	6	1	2	0	2	0	54
5.51- 6.50	1	1	3	2	3	2	3	6	16	10	9	6	3	1	1	0	67
6.51- 8.50	0	1	1	1	9	7	6	7	22	16	14	7	5	1	0	1	98
8.51-11.50	1	0	0	2	5	1	0	0	4	5	15	5	1	1	1	1	42
11.51-14.50	0	0	0	0	1	0	0	0	0	0	5	3	0	0	0	0	9
14.51-20.50	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	6
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	5	10	13	10	27	13	15	18	50	49	60	22	12	5	5	5	323

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2017 TO 12/31/2017

*** 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: 0.75 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																	8
.76- 1.50	0	1	0	1	1	0	0	1	0	1	1	1	0	0	1	2	10
1.51- 2.50	3	1	2	3	1	2	4	3	4	8	7	10	4	3	6	2	63
2.51- 3.50	4	9	13	8	2	5	3	10	18	20	29	8	9	5	7	3	153
3.51- 4.50	4	13	14	7	7	2	5	12	28	29	16	8	8	7	5	5	170
4.51- 5.50	2	1	19	12	4	10	7	6	24	18	27	7	5	1	0	5	148
5.51- 6.50	4	3	6	9	7	3	4	10	24	13	15	8	4	3	0	4	117
6.51- 8.50	1	1	8	5	4	10	14	8	16	13	17	8	6	2	0	2	115
8.51-11.50	1	0	2	6	7	8	2	3	3	12	19	3	4	2	1	1	74
11.51-14.50	1	1	2	2	9	0	0	1	0	4	16	4	1	2	0	0	43
14.51-20.50	0	0	0	1	9	1	1	0	2	2	9	3	0	0	1	0	29
>20.50	0	0	1	1	0	1	0	0	0	0	2	0	0	0	0	0	5
TOTAL	20	30	67	55	51	42	40	54	119	120	158	60	41	25	21	24	935

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	4
.76- 1.50	0	0	1	1	0	0	0	1	1	3	2	1	1	1	5	0	17
1.51- 2.50	5	1	1	2	2	0	1	5	1	7	3	7	9	6	5	4	59
2.51- 3.50	5	5	1	2	1	2	2	3	9	6	10	7	10	7	5	3	78
3.51- 4.50	5	7	3	3	3	5	3	4	5	6	10	10	5	2	1	5	77
4.51- 5.50	2	3	0	1	1	0	3	3	4	10	12	9	2	0	3	1	54
5.51- 6.50	0	3	4	3	3	2	4	5	4	13	20	8	5	1	2	0	77
6.51- 8.50	1	0	6	6	4	3	5	6	10	21	20	16	5	6	1	3	113
8.51-11.50	0	0	6	5	11	3	6	5	9	10	31	13	6	9	3	2	119
11.51-14.50	0	1	3	3	8	1	5	1	1	13	8	3	1	5	6	2	61
14.51-20.50	1	0	0	2	14	1	0	2	0	3	8	3	0	5	1	0	40
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	19	20	25	28	47	17	29	35	44	92	124	77	44	42	32	20	699

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	2
.76- 1.50	0	1	1	1	0	0	0	0	1	1	0	1	4	2	1	0	13
1.51- 2.50	3	4	5	1	0	3	2	0	2	5	2	2	9	7	6	6	57
2.51- 3.50	3	5	3	1	3	2	4	1	3	9	14	14	13	2	6	6	89
3.51- 4.50	11	5	5	1	2	2	1	0	6	8	11	11	6	4	8	7	88
4.51- 5.50	6	2	4	4	3	1	2	3	5	4	15	15	6	4	4	8	86
5.51- 6.50	2	2	3	4	1	1	0	2	3	9	14	8	6	1	4	5	65
6.51- 8.50	5	3	4	4	2	1	1	1	2	8	28	10	5	8	5	3	90
8.51-11.50	1	1	2	1	0	0	0	2	2	8	8	5	1	1	2	3	37
11.51-14.50	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3
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	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	31	23	27	19	11	10	12	9	24	52	92	66	50	29	36	38	531

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2017 TO 12/31/2017

*** 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: 0.75 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																	6
.76- 1.50	5	5	1	2	2	0	0	0	0	1	0	4	4	1	4	1	30
1.51- 2.50	29	31	15	6	4	1	5	2	1	4	5	5	15	11	23	17	174
2.51- 3.50	53	52	9	3	2	4	2	9	6	3	8	10	12	25	30	54	282
3.51- 4.50	81	48	15	4	4	8	6	4	5	7	6	6	5	18	25	43	285
4.51- 5.50	55	29	11	2	2	6	1	2	7	3	4	7	0	4	17	37	187
5.51- 6.50	26	21	8	2	1	3	3	4	3	0	2	0	1	0	6	14	94
6.51- 8.50	13	9	4	2	1	1	1	2	0	1	1	0	0	0	2	13	50
8.51-11.50	3	0	3	0	0	0	0	0	0	1	0	0	0	0	0	1	8
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	265	195	66	21	16	23	18	23	22	20	26	32	37	59	107	180	1116

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	25
.76- 1.50	5	7	3	5	3	0	0	2	2	6	3	7	9	4	11	3	70
1.51- 2.50	41	37	24	13	7	7	12	10	9	26	18	24	37	28	40	29	362
2.51- 3.50	66	74	27	15	8	13	11	23	37	40	64	39	45	39	48	66	615
3.51- 4.50	101	78	38	17	16	17	17	21	45	52	51	36	24	34	40	63	650
4.51- 5.50	67	36	41	21	13	22	18	19	48	50	65	42	17	9	26	51	545
5.51- 6.50	33	30	25	21	18	11	16	31	57	54	72	33	20	8	16	25	470
6.51- 8.50	21	14	24	22	30	25	34	34	72	93	110	59	27	21	9	23	618
8.51-11.50	7	1	13	18	33	18	8	12	24	65	106	56	25	14	13	10	423
11.51-14.50	1	2	5	10	26	1	7	3	1	26	48	13	4	7	7	3	164
14.51-20.50	1	0	0	3	30	2	1	2	2	8	27	7	0	5	6	0	94
>20.50	0	0	1	2	0	1	0	0	0	0	2	0	0	0	0	0	6
TOTAL	343	279	201	147	184	117	124	157	297	420	566	316	208	169	216	273	4042

TOTAL NUMBER OF OBSERVATIONS: 4416
TOTAL NUMBER OF VALID OBSERVATIONS: 4042
TOTAL NUMBER OF MISSING OBSERVATIONS: 374
PERCENT DATA RECOVERY FOR THIS PERIOD: 91.5 %
MEAN WIND SPEED FOR THIS PERIOD: 5.8 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
5.12	5.71	7.99	23.13	17.29	13.14	27.61

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	1	1	3	7	5	2	4	9	46	57	38	18	4	10	2	0
B	3	0	2	11	25	7	8	14	29	41	49	21	6	5	5	4	1
C	5	10	13	10	27	13	15	18	50	49	60	22	12	5	5	5	4
D	20	30	67	55	51	42	40	54	119	120	158	60	41	25	21	24	8
E	19	20	25	28	47	17	29	35	44	92	124	77	44	42	32	20	4
F	31	23	27	19	11	10	12	9	24	52	92	66	50	29	36	38	2
G	265	195	66	21	16	23	18	23	22	20	26	32	37	59	107	180	6
TOTAL	343	279	201	147	184	117	124	157	297	420	566	316	208	169	216	273	25

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2017 TO 12/31/2017

*** 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: 0.75 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	1	0	0	0	0	0	0	0	0	0	0	1
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	2	0	0	0	1	0	1	1	0	1	1	0	1	0	0	8
4.51- 5.50	1	0	0	0	2	1	1	6	2	2	4	2	4	1	0	1	27
5.51- 6.50	0	0	1	3	4	1	2	5	11	8	8	6	2	3	3	1	58
6.51- 8.50	0	2	0	4	4	9	4	7	14	30	33	29	10	3	2	0	151
8.51-11.50	1	0	0	2	4	3	0	1	8	42	64	48	23	7	7	4	214
11.51-14.50	0	0	0	1	2	0	0	1	3	24	46	16	18	5	3	5	124
14.51-20.50	0	0	3	0	0	0	0	1	3	16	31	4	9	6	4	1	78
>20.50	0	0	1	0	0	0	0	0	1	6	3	0	1	0	1	1	14
TOTAL	2	4	5	10	16	16	7	22	43	128	190	106	67	26	20	13	675

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	1
.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	1	0	0	0	0	0	1
2.51- 3.50	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
3.51- 4.50	0	0	0	1	0	0	2	2	2	1	1	1	0	2	0	1	13
4.51- 5.50	1	0	0	1	0	1	1	3	16	9	5	5	3	2	3	0	50
5.51- 6.50	1	1	1	3	2	1	4	4	9	12	15	5	5	1	1	2	67
6.51- 8.50	1	1	4	7	9	3	9	10	27	23	31	16	8	5	1	3	158
8.51-11.50	1	0	1	3	11	7	0	2	4	17	26	17	7	2	5	2	105
11.51-14.50	1	0	0	4	6	0	0	1	0	1	10	0	1	1	0	1	26
14.51-20.50	0	0	0	2	1	0	0	0	0	1	5	3	2	2	1	0	17
>20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
TOTAL	5	2	7	21	30	12	16	22	58	64	95	47	26	15	12	9	442

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	4
.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	1	1	0	0	0	0	1	2	0	0	0	1	0	0	7
2.51- 3.50	1	3	1	1	0	0	1	1	1	2	3	1	1	0	1	0	17
3.51- 4.50	2	5	2	2	0	1	2	3	3	9	12	1	1	4	4	4	55
4.51- 5.50	4	2	9	4	3	4	6	7	16	23	16	5	4	3	4	5	115
5.51- 6.50	3	7	6	8	4	3	4	10	30	15	20	6	4	4	2	1	127
6.51- 8.50	1	6	8	2	13	10	7	7	23	20	28	14	10	3	0	1	153
8.51-11.50	1	0	5	2	6	4	0	2	4	7	22	12	2	5	2	1	75
11.51-14.50	0	0	1	0	2	0	0	1	0	1	11	6	2	2	1	0	27
14.51-20.50	0	1	0	1	6	0	0	0	0	1	6	3	2	1	0	0	21
>20.50	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
TOTAL	13	24	33	21	34	22	20	31	78	81	119	48	26	23	14	12	603

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2017 TO 12/31/2017

*** 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: 0.75 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																	9
.76- 1.50	0	1	0	1	1	0	0	1	0	1	1	1	0	0	1	3	11
1.51- 2.50	4	1	6	7	2	3	7	5	13	10	9	14	9	5	9	7	111
2.51- 3.50	17	17	20	12	7	7	11	21	30	31	45	14	17	16	15	13	293
3.51- 4.50	10	20	28	13	13	6	10	19	46	45	28	13	17	15	9	15	307
4.51- 5.50	11	12	29	17	7	12	11	14	46	36	44	12	10	7	3	6	277
5.51- 6.50	9	13	13	15	9	5	5	12	34	19	26	12	11	4	0	5	192
6.51- 8.50	7	5	22	6	7	16	20	10	21	23	32	19	16	3	2	5	214
8.51-11.50	5	0	3	14	10	12	6	8	4	21	45	11	11	5	6	4	165
11.51-14.50	1	1	3	4	14	0	0	1	0	11	21	11	8	7	4	0	86
14.51-20.50	0	0	1	1	10	1	1	0	4	13	24	15	5	5	5	1	86
>20.50	0	0	1	1	0	1	0	0	0	1	4	0	0	2	0	0	10
TOTAL	64	70	126	91	80	63	71	91	198	211	279	122	104	69	54	59	1761

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	4
.76- 1.50	0	0	1	1	0	0	0	1	1	3	2	1	1	2	6	1	20
1.51- 2.50	9	4	2	4	3	0	3	7	1	10	5	16	14	10	8	12	108
2.51- 3.50	12	10	3	4	2	3	3	6	11	9	16	12	17	22	16	10	156
3.51- 4.50	13	9	9	4	4	6	4	6	7	15	20	15	7	7	6	16	148
4.51- 5.50	4	8	6	3	1	1	8	5	14	20	23	20	6	3	6	3	131
5.51- 6.50	5	3	6	3	3	2	5	5	9	17	30	19	9	4	8	3	131
6.51- 8.50	7	4	10	8	6	3	6	13	17	39	43	30	9	17	3	6	221
8.51-11.50	3	3	7	6	15	4	7	8	14	29	69	33	14	19	8	6	245
11.51-14.50	0	1	4	4	10	3	9	3	3	27	52	24	7	16	11	6	180
14.51-20.50	3	0	3	2	16	1	2	3	5	13	22	16	0	16	5	4	111
>20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3
TOTAL	56	42	51	39	60	23	47	57	82	182	284	186	84	117	77	67	1458

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	2
.76- 1.50	1	2	1	1	0	0	0	0	1	3	0	1	4	2	1	0	17
1.51- 2.50	7	11	5	2	2	3	3	1	4	6	5	5	15	13	13	10	105
2.51- 3.50	14	8	7	4	6	4	5	5	6	12	18	22	19	12	29	26	197
3.51- 4.50	20	11	8	2	2	4	1	1	7	18	19	19	15	12	25	28	192
4.51- 5.50	15	5	7	4	4	1	2	3	9	11	24	28	16	14	14	20	177
5.51- 6.50	4	8	4	5	1	1	1	3	8	14	30	15	14	9	17	14	148
6.51- 8.50	9	6	6	4	2	1	1	2	3	18	60	39	23	15	16	17	222
8.51-11.50	4	5	3	1	1	0	0	3	2	9	27	21	8	7	7	15	113
11.51-14.50	1	0	1	1	0	0	2	0	0	2	2	0	0	0	0	5	14
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	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	75	56	42	25	18	14	15	18	40	93	185	150	114	84	122	135	1188

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD
1/01/2017 TO 12/31/2017

*** 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: 0.75 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																	6
.76- 1.50	8	5	2	3	2	0	0	0	0	1	0	5	7	2	6	1	42
1.51- 2.50	44	38	18	7	5	2	5	3	1	8	11	14	22	18	40	31	267
2.51- 3.50	89	89	15	6	5	5	4	10	10	11	10	24	23	46	65	115	527
3.51- 4.50	155	87	22	10	7	10	7	10	10	9	11	13	17	27	49	118	562
4.51- 5.50	148	60	24	6	4	7	3	7	12	7	12	9	5	10	29	77	420
5.51- 6.50	68	53	15	5	2	5	4	5	3	3	5	2	2	3	6	36	217
6.51- 8.50	36	37	9	3	1	2	1	2	0	4	9	4	2	1	8	29	148
8.51-11.50	12	8	4	1	0	0	0	0	0	3	2	0	0	0	1	3	34
11.51-14.50	1	0	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	561	377	109	41	26	31	24	37	36	46	60	71	78	107	204	410	2224

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	26
.76- 1.50	9	8	4	6	3	0	0	2	2	8	3	8	12	6	14	5	90
1.51- 2.50	65	54	32	21	12	9	18	16	20	36	31	49	60	47	70	60	600
2.51- 3.50	133	127	47	27	21	19	24	43	58	65	92	73	77	96	126	164	1192
3.51- 4.50	200	134	69	32	26	28	26	42	76	97	92	63	57	68	93	182	1285
4.51- 5.50	184	87	75	35	21	27	32	45	115	108	128	81	48	40	59	112	1197
5.51- 6.50	90	85	46	42	25	18	25	44	104	88	134	65	47	28	37	62	940
6.51- 8.50	61	61	59	34	42	44	48	51	105	157	236	151	78	47	32	61	1267
8.51-11.50	27	16	23	29	47	30	13	24	36	128	255	142	65	45	36	35	951
11.51-14.50	4	2	9	14	34	3	11	7	6	66	142	57	36	31	19	17	458
14.51-20.50	3	1	7	6	33	2	3	4	12	44	88	41	18	30	15	6	313
>20.50	0	0	2	2	0	1	0	0	1	8	11	0	1	3	2	1	32
TOTAL	776	575	373	248	264	181	200	278	535	805	1212	730	499	441	503	705	8351

TOTAL NUMBER OF OBSERVATIONS: 8760
TOTAL NUMBER OF VALID OBSERVATIONS: 8351
TOTAL NUMBER OF MISSING OBSERVATIONS: 409
PERCENT DATA RECOVERY FOR THIS PERIOD: 95.3 %
MEAN WIND SPEED FOR THIS PERIOD: 6.3 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
8.08	5.29	7.22	21.09	17.46	14.23	26.63

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	2	4	5	10	16	16	7	22	43	128	190	106	67	26	20	13	0
B	5	2	7	21	30	12	16	22	58	64	95	47	26	15	12	9	1
C	13	24	33	21	34	22	20	31	78	81	119	48	26	23	14	12	4
D	64	70	126	91	80	63	71	91	198	211	279	122	104	69	54	59	9
E	56	42	51	39	60	23	47	57	82	182	284	186	84	117	77	67	4
F	75	56	42	25	18	14	15	18	40	93	185	150	114	84	122	135	2
G	561	377	109	41	26	31	24	37	36	46	60	71	78	107	204	410	6
TOTAL	776	575	373	248	264	181	200	278	535	805	1212	730	499	441	503	705	26

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 has been removed as the Energy Information Center (EIC) has been moved offsite.

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 µR/hr (17 - 30 mR/Std Qtr).

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

Dose Calculation Models

The GASPAR computer code was used to evaluate the radiological consequences of the routine release of gaseous effluents. GASPAR 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 GASPAR 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 2017 Land Use Census.

0 to 10 mile population from the PVNGS Emergency Plan, Rev 60.

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/m^3 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 calculation purposes these milk animals are assumed to be fed 100% on pasture grass during the year.

Other values used for input to GASPAR are default values from Regulatory Guide 1.109, Rev. 1.

Table 43:

Doses To Special Locations For 2017
NA

ENERGY INFORMATION CENTER (EIC) was relocated to an offsite location in 2011.

Table 44:

Integrated Population Dose for 2017

January to March

Pathway	Total Body	GI-Tract	Bone	Liver	Kidney	Thyroid	Lung	Skin
Plume	7.01E-05	7.01E-05	7.01E-05	7.01E-05	7.01E-05	7.01E-05	7.01E-05	1.34E-04
	0.00%	0.00%	89.67%	0.00%	0.00%	0.00%	0.00%	0.00%
Ground	8.08E-06	8.08E-06	8.08E-06	8.08E-06	8.08E-06	8.08E-06	8.08E-06	9.51E-06
	0.00%	0.00%	10.33%	0.00%	0.00%	0.00%	0.00%	0.00%
Inhalation	1.80E+00	1.80E+00	0.00	1.80E+00	1.80E+00	1.80E+00	1.80E+00	1.80E+00
	25.50%	25.50%	0.00%	25.50%	25.50%	25.50%	25.50%	25.50%
Vegetation	4.58E+00	4.58E+00	0.00	4.58E+00	4.58E+00	4.58E+00	4.58E+00	4.58E+00
	64.70%	64.70%	0.00%	64.70%	64.70%	64.70%	64.70%	64.70%
Cow Milk	4.63E-01	4.63E-01	0.00	4.63E-01	4.63E-01	4.63E-01	4.63E-01	4.63E-01
	6.55%	6.55%	0.00%	6.55%	6.55%	6.55%	6.55%	6.55%
Meat	2.30E-01	2.30E-01	0.00	2.30E-01	2.30E-01	2.30E-01	2.30E-01	2.30E-01
	3.25%	3.25%	0.00%	3.25%	3.25%	3.25%	3.25%	3.25%
Total	7.08E+00	7.08E+00	7.82E-05	7.08E+00	7.08E+00	7.08E+00	7.08E+00	7.08E+00
Per Capita Dose (rem) (1)	3.61E-06	3.61E-06	3.99E-11	3.61E-06	3.61E-06	3.61E-06	3.61E-06	3.61E-06

April through June

Pathway	Total Body	GI-Tract	Bone	Liver	Kidney	Thyroid	Lung	Skin
Plume	9.48E-05	9.48E-05	9.48E-05	9.48E-05	9.48E-05	9.48E-05	9.48E-05	1.69E-04
	0.00%	0.00%	9.06%	0.00%	0.00%	0.00%	0.00%	0.00%
Ground	9.44E-04	9.44E-04	9.44E-04	9.44E-04	9.44E-04	9.44E-04	9.44E-04	1.11E-03
	0.02%	0.02%	90.16%	0.02%	0.02%	0.02%	0.02%	0.03%
Inhalation	1.59E+00	1.59E+00	5.32E-06	1.59E+00	1.59E+00	1.59E+00	1.59E+00	1.59E+00
	40.58%	40.58%	0.51%	40.58%	40.58%	40.59%	40.59%	40.58%
Vegetation	1.85E+00	1.85E+00	2.37E-06	1.85E+00	1.85E+00	1.85E+00	1.85E+00	1.85E+00
	47.14%	47.14%	0.23%	47.14%	47.14%	47.14%	47.14%	47.14%
Cow Milk	4.10E-01	4.10E-01	5.22E-07	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01
	10.46%	10.45%	0.05%	10.46%	10.46%	10.45%	10.45%	10.45%
Meat	7.03E-02	7.03E-02	1.08E-09	7.03E-02	7.03E-02	7.03E-02	7.03E-02	7.03E-02
	1.79%	1.79%	0.00%	1.79%	1.79%	1.79%	1.79%	1.79%
Total	3.92E+00	3.92E+00	1.05E-03	3.92E+00	3.92E+00	3.92E+00	3.92E+00	3.92E+00
Per Capita Dose (rem) (1)	2.00E-06	2.00E-06	5.36E-10	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06

Table 44: (continued)
Integrated Population Dose for 2017

January through June

Pathway	Total Body	GI-Tract	Bone	Liver	Kidney	Thyroid	Lung	Skin
Plume	1.65E-04	1.65E-04	1.65E-04	1.65E-04	1.65E-04	1.65E-04	1.65E-04	3.03E-04
	0.00%	0.00%	14.66%	0.00%	0.00%	0.00%	0.00%	0.00%
Ground	9.52E-04	9.52E-04	9.52E-04	9.52E-04	9.52E-04	9.52E-04	9.52E-04	1.12E-03
	0.01%	0.01%	84.61%	0.01%	0.01%	0.01%	0.01%	0.01%
Inhalation	3.39E+00	3.39E+00	5.32E-06	3.39E+00	3.39E+00	3.40E+00	3.40E+00	3.39E+00
	30.87%	30.87%	0.47%	30.87%	30.87%	30.88%	30.88%	30.87%
Vegetation	6.43E+00	6.43E+00	2.37E-06	6.43E+00	6.43E+00	6.43E+00	6.43E+00	6.43E+00
	58.44%	58.44%	0.21%	58.44%	58.44%	58.44%	58.44%	58.44%
Cow Milk	8.73E-01	8.73E-01	5.22E-07	8.73E-01	8.73E-01	8.73E-01	8.73E-01	8.73E-01
	7.94%	7.94%	0.05%	7.94%	7.94%	7.94%	7.94%	7.94%
Meat	3.01E-01	3.01E-01	1.08E-09	3.01E-01	3.01E-01	3.01E-01	3.01E-01	3.01E-01
	2.73%	2.73%	0.00%	2.73%	2.73%	2.73%	2.73%	2.73%
Total	1.10E+01	1.10E+01	1.12E-03	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01
Per Capita Dose (rem) (1)	5.62E-06	5.62E-06	5.72E-10	5.62E-06	5.62E-06	5.62E-06	5.62E-06	5.62E-06

July through September

Pathway	Total Body	GI-Tract	Bone	Liver	Kidney	Thyroid	Lung	Skin
Plume	1.54E-04	1.54E-04	1.54E-04	1.54E-04	1.54E-04	1.54E-04	1.54E-04	2.80E-04
	0.00%	0.00%	99.22%	0.00%	0.00%	0.00%	0.00%	0.01%
Ground	1.17E-06	1.17E-06	1.17E-06	1.17E-06	1.17E-06	1.17E-06	1.17E-06	1.37E-06
	0.00%	0.00%	0.75%	0.00%	0.00%	0.00%	0.00%	0.00%
Inhalation	2.06E+00	2.06E+00	4.18E-08	2.06E+00	2.06E+00	2.06E+00	2.06E+00	2.06E+00
	40.29%	40.29%	0.03%	40.29%	40.29%	40.29%	40.29%	40.29%
Vegetation	2.43E+00	2.43E+00	3.12E-10	2.43E+00	2.43E+00	2.43E+00	2.43E+00	2.43E+00
	47.67%	47.67%	0.00%	47.67%	47.67%	47.67%	47.67%	47.67%
Cow Milk	5.30E-01	5.30E-01	1.30E-11	5.30E-01	5.30E-01	5.30E-01	5.30E-01	5.30E-01
	10.39%	10.39%	0.00%	10.39%	10.39%	10.39%	10.39%	10.39%
Meat	8.38E-02	8.38E-02	3.43E-11	8.38E-02	8.38E-02	8.38E-02	8.38E-02	8.38E-02
	1.64%	1.64%	0.00%	1.64%	1.64%	1.64%	1.64%	1.64%
Total	5.10E+00	5.10E+00	1.55E-04	5.10E+00	5.10E+00	5.10E+00	5.10E+00	5.10E+00
Per Capita Dose (rem) (1)	2.60E-06	2.60E-06	7.91E-11	2.60E-06	2.60E-06	2.60E-06	2.60E-06	2.60E-06

Table 44: (continued)
Integrated Population Dose for 2017

October through December

Pathway	Total Body	GI-Tract	Bone	Liver	Kidney	Thyroid	Lung	Skin
Plume	1.34E-04	1.34E-04	1.34E-04	1.34E-04	1.34E-04	1.34E-04	1.34E-04	2.75E-04
	0.00%	0.00%	21.62%	0.00%	0.00%	0.00%	0.00%	0.00%
Ground	4.84E-04	4.84E-04	4.84E-04	4.84E-04	4.84E-04	4.84E-04	4.84E-04	5.70E-04
	0.01%	0.01%	78.24%	0.01%	0.01%	0.01%	0.01%	0.01%
Inhalation	1.85E+00	1.85E+00	7.77E-07	1.85E+00	1.85E+00	1.85E+00	1.85E+00	1.85E+00
	31.33%	31.33%	0.13%	31.33%	31.33%	31.33%	31.33%	31.33%
Vegetation	3.42E+00	3.42E+00	8.04E-08	3.42E+00	3.42E+00	3.42E+00	3.42E+00	3.42E+00
	57.92%	57.92%	0.01%	57.92%	57.92%	57.92%	57.92%	57.92%
Cow Milk	4.97E-01	4.97E-01	9.02E-09	4.97E-01	4.97E-01	4.97E-01	4.97E-01	4.97E-01
	8.4%	8.4%	0.00%	8.4%	8.4%	8.4%	8.4%	8.4%
Meat	1.37E-01	1.37E-01	2.00E-10	1.37E-01	1.37E-01	1.37E-01	1.37E-01	1.37E-01
	2.32%	2.32%	0.00%	2.32%	2.32%	2.32%	2.32%	2.32%
Total	5.91E+00	5.91E+00	6.19E-04	5.91E+00	5.91E+00	5.91E+00	5.91E+00	5.91E+00
Per Capita Dose (rem) (1)	3.02E-06	3.02E-06	3.16E-10	3.02E-06	3.02E-06	3.02E-06	3.02E-06	3.02E-06

July through December

Pathway	Total Body	GI-Tract	Bone	Liver	Kidney	Thyroid	Lung	Skin
Plume	2.88E-04	2.88E-04	2.88E-04	2.88E-04	2.88E-04	2.88E-04	2.88E-04	5.54E-04
	0.00%	0.00%	37.18%	0.00%	0.00%	0.00%	0.00%	0.01%
Ground	4.86E-04	4.86E-04	4.86E-04	4.86E-04	4.86E-04	4.86E-04	4.86E-04	4.86E-04
	0.00%	0.00%	67.70%	0.00%	0.00%	0.00%	0.00%	0.01%
Inhalation	3.91E+00	3.91E+00	8.19E-07	3.91E+00	3.91E+00	3.91E+00	3.91E+00	3.91E+00
	35.49%	35.49%	0.11%	35.49%	35.49%	35.49%	35.49%	35.49%
Vegetation	5.86E+00	5.86E+00	8.07E-08	5.86E+00	5.86E+00	5.86E+00	5.86E+00	5.86E+00
	53.17%	53.17%	0.01%	53.17%	53.17%	53.17%	53.17%	53.17%
Cow Milk	1.03E+00	1.03E+00	9.03E-09	1.03E+00	1.03E+00	1.03E+00	1.03E+00	1.03E+00
	9.33%	9.33%	0.00%	9.33%	9.33%	9.33%	9.33%	9.33%
Meat	2.21E-01	2.21E-01	2.34E-10	2.21E-01	2.21E-01	2.21E-01	2.21E-01	2.21E-01
	2.00%	2.00%	0.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Total	1.10E+01	1.10E+01	7.75E-04	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01
Per Capita Dose (rem) (1)	5.62E-06	5.62E-06	3.96E-10	5.62E-06	5.62E-06	5.62E-06	5.62E-06	5.62E-06

Table 44: (continued)
Integrated Population Dose for 2017

January through December

Pathway	Total Body	GI-Tract	Bone	Liver	Kidney	Thyroid	Lung	Skin
Plume	4.53E-04	4.53E-04	4.53E-04	4.53E-04	4.53E-04	4.53E-04	4.53E-04	8.57E-04
	0.00%	0.00%	23.84%	0.00%	0.00%	0.00%	0.00%	0.00%
Ground	1.44E-03	1.44E-03	1.44E-03	1.44E-03	1.44E-03	1.44E-03	1.44E-03	1.69E-03
	0.01%	0.01%	75.68%	0.01%	0.01%	0.01%	0.01%	0.01%
Inhalation	7.30E+00	7.30E+00	6.13E-06	7.30E+00	7.30E+00	7.30E+00	7.30E+00	7.30E+00
	33.18%	33.18%	0.32%	33.18%	33.18%	33.18%	33.18%	33.18%
Vegetation	1.23E+01	1.23E+01	2.45E-06	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01
	55.81%	55.81%	0.13%	55.81%	55.81%	55.81%	55.81%	55.81%
Cow Milk	1.90E+00	1.90E+00	6.74E-07	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00
	8.63%	8.63%	0.03%	8.63%	8.63%	8.63%	8.63%	8.63%
Meat	5.21E-01	5.21E-01	1.31E-09	5.21E-01	5.21E-01	5.21E-01	5.21E-01	5.21E-01
	2.37%	2.37%	0.00%	2.37%	2.37%	2.37%	2.37%	2.37%
Total	2.20E+01	2.20E+01	1.90E-03	2.20E+01	2.20E+01	2.20E+01	2.20E+01	2.20E+01
Per Capita Dose (rem) (1)	1.12E-05	1.12E-05	9.70E-10	1.12E-05	1.12E-05	1.12E-05	1.12E-05	1.12E-05

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

Table 45:
Summary of Individual Doses for 2017
Radiation Doses At And Beyond The Site Boundary

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	3.90E-04	1.50E-04	3.20E-04	9.63E-04	1.56E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	7.80E-03	3.00E-03	6.40E-03	1.93E-02	1.56E-02
Beta Air Dose	mrad	1.41E-04	5.28E-05	1.14E-04	3.54E-04	5.70E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	1.41E-03	5.28E-04	1.14E-03	3.54E-03	2.85E-03
Maximum Individual						
Total Body	mrem	2.59E-04	9.95E-05	2.13E-04	6.40E-04	1.04E-03
Skin	mrem	4.16E-04	1.59E-04	3.41E-04	1.03E-03	1.67E-03
Location						
Unit 1	miles	1.70 SSE	0.66 NNE	0.66 NNE	1.40 SSW	1.40 SSW
Unit 2	miles	1.88 SSE	0.83 NNE	0.83 NNE	1.14 SSW	1.14 SSW
Unit 3	miles	1.73 SSE	1.05 NNE	1.05 NNE	1.00 SSW	1.00 SSW
Maximum Organ Dose(1) From All Radionuclides						
	Age	Infant	Child	Child	Infant	Child
	Organ	Bone	Bone	Bone	Bone	Bone
	mrem	1.99E+00	2.28E+00	1.83E+00	2.83E+00	6.68E+00
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	2.65E+01	3.04E+01	2.44E+01	3.77E+01	4.45E+01
Location						
Unit 1	miles	3.99 SE	1.93 NE	1.93 NE	3.99 SE	1.93 NE
Unit 2	miles	3.99 SE	2.16 NE	2.16 NE	3.99 SE	2.16 NE
Unit 3	miles	3.93 SE	2.36 NE	2.36 NE	3.93 SE	2.36 NE
Maximum Organ Dose(1) From All Radionuclides Excluding C-14						
	Age	Infant	Child	Child	Infant	Child
	Organ	Thyroid (2)	Thyroid (2)	Thyroid (2)	Thyroid (2)	Thyroid (2)
	mrem	2.62E-01	1.37E-01	2.16E-01	1.65E-01	5.36E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	3.49E+00	1.83E+00	2.88E+00	2.20E+00	3.57E+00
Organ Dose from tritium only for Unit 2 location above	mrem	3.05E-02	1.36E-01	2.16E-01	1.92E-02	5.35E-01
Fraction of organ dose from tritum only for Unit 2 location above	%	11.64	99.27	100	11.64	99.81
X/Q for Unit 2 location above	sec/m^3	1.89E-06	2.02E-06	1.62E-06	2.68E-06	1.48E-06
D/Q for Unit 2 location above	m-2	6.26E-10	5.66E-09	4.56E-09	5.79E-10	3.51E-09

(1) Excluding skin

(2) 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

APPENDIX D: NEI 07-07 GROUNDWATER PROTECTION INITIATIVE SAMPLING

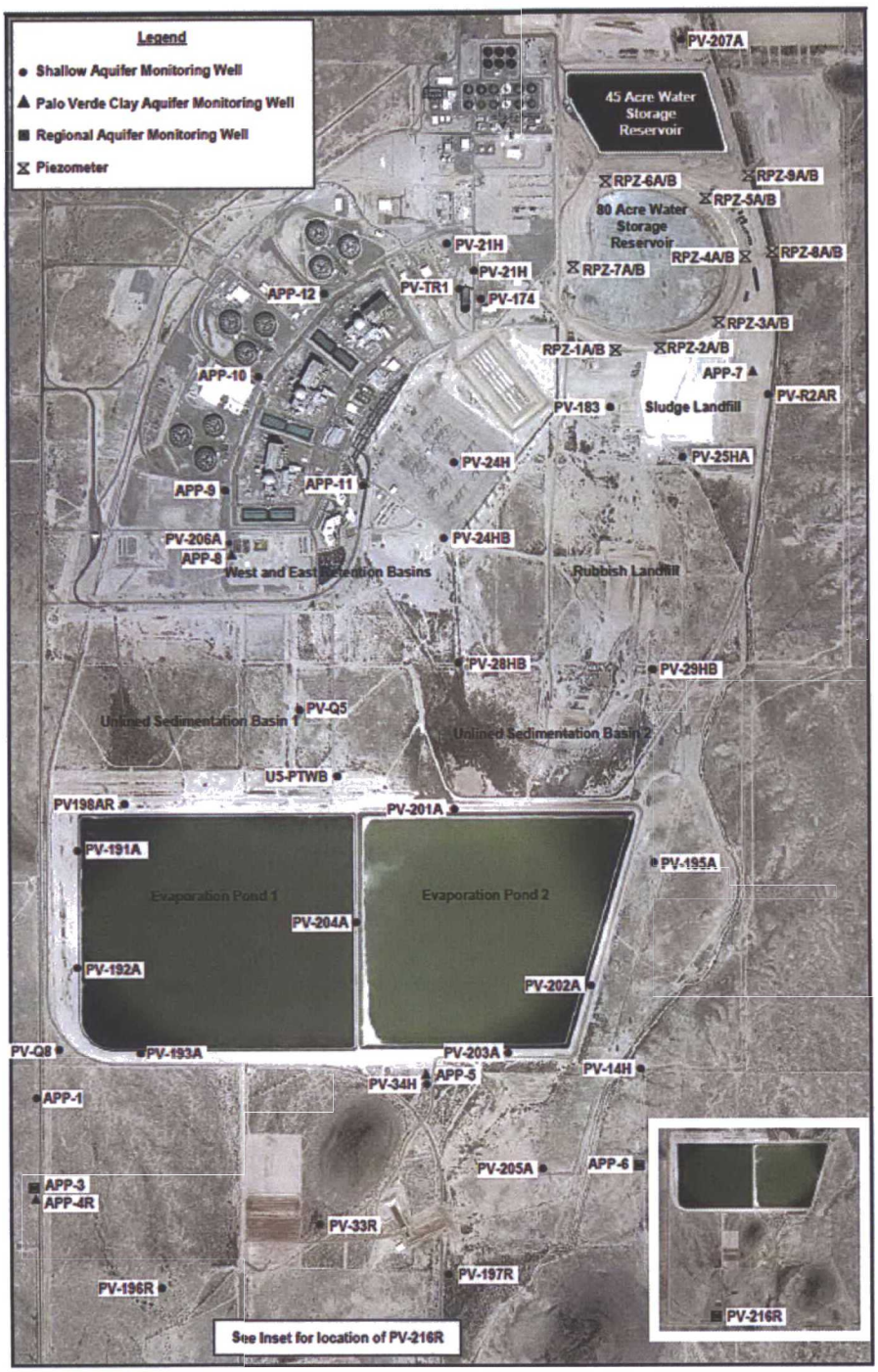

Figure 1. Onsite Well Locations.

Table 46: 2017 NEI 07-07 Ground Water Protection Initiative PVNGS Well Data

Monitoring Well ID	Sample ID	Sample Date	Radionuclide	Concentration (pCi/L)
APP-10	PV-APP-10-0317	3/29/2017	Cesium-134	<1.3
APP-10	PV-APP-10-0317	3/29/2017	Cesium-137	<0.8
APP-10	PV-APP-10-0317	3/29/2017	Cobalt-60	<0.4
APP-10	PV-APP-10-0317	3/29/2017	Tritium	<259
APP-10	PV-FD-01-0317	3/29/2017	Cesium-134	<1.2
APP-10	PV-FD-01-0317	3/29/2017	Cesium-137	<0.8
APP-10	PV-FD-01-0317	3/29/2017	Cobalt-60	<0.4
APP-10	PV-FD-01-0317	3/29/2017	Tritium	<259
APP-10	PV-APP-10-0517	5/19/2017	Cesium-134	<1.3
APP-10	PV-APP-10-0517	5/19/2017	Cesium-137	<0.9
APP-10	PV-APP-10-0517	5/19/2017	Cobalt-60	<0.8
APP-10	PV-APP-10-0517	5/19/2017	Tritium	<264
APP-10	PV-APP-10-0717	7/26/2017	Cesium-134	<0.8
APP-10	PV-APP-10-0717	7/26/2017	Cesium-137	<0.4
APP-10	PV-APP-10-0717	7/26/2017	Cobalt-60	<0.5
APP-10	PV-APP-10-0717	7/26/2017	Tritium	<287
APP-10	PV-FD-01-0717	7/26/2017	Cesium-134	<0.8
APP-10	PV-FD-01-0717	7/26/2017	Cesium-137	<0.4
APP-10	PV-FD-01-0717	7/26/2017	Cobalt-60	<0.5
APP-10	PV-FD-01-0717	7/26/2017	Tritium	<287
APP-10	PV-APP-10-1017	10/24/2017	Cesium-134	<1.2
APP-10	PV-APP-10-1017	10/24/2017	Cesium-137	<1.3
APP-10	PV-APP-10-1017	10/24/2017	Cobalt-60	<1.2
APP-10	PV-APP-10-1017	10/24/2017	Tritium	<290
APP-12	PV-APP-12-0317	3/29/2017	Cesium-134	<1.3
APP-12	PV-APP-12-0317	3/29/2017	Cesium-137	<1.2
APP-12	PV-APP-12-0317	3/29/2017	Cobalt-60	<1.1
APP-12	PV-APP-12-0317	3/29/2017	Tritium	<259
APP-12	PV-APP-12-0517	5/19/2017	Cesium-134	<1.8

Table 46: Continued

Monitoring Well ID	Sample ID	Sample Date	Radionuclide	Concentration (pCi/L)
APP-12	PV-APP-12-0517	5/19/2017	Cesium-137	<1.4
APP-12	PV-APP-12-0517	5/19/2017	Cobalt-60	<0.1
APP-12	PV-APP-12-0517	5/19/2017	Tritium	<264
APP-12	PV-APP-12-0717	7/26/2017	Cesium-134	<1.3
APP-12	PV-APP-12-0717	7/26/2017	Cesium-137	<1.1
APP-12	PV-APP-12-0717	7/26/2017	Cobalt-60	<0.9
APP-12	PV-APP-12-0717	7/26/2017	Tritium	<287
APP-12	PV-APP-12-1017	10/24/2017	Cesium-134	<1
APP-12	PV-APP-12-1017	10/24/2017	Cesium-137	<0.4
APP-12	PV-APP-12-1017	10/24/2017	Cobalt-60	<0.7
APP-12	PV-APP-12-1017	10/24/2017	Tritium	<290
APP-15	PV-APP-15-0417	4/18/2017	Cesium-134	<1
APP-15	PV-APP-15-0417	4/18/2017	Cesium-137	<1
APP-15	PV-APP-15-0417	4/18/2017	Cobalt-60	<0.3
APP-15	PV-APP-15-0417	4/18/2017	Tritium	<294
APP-15	PV-APP-15-1017	10/26/2017	Cesium-134	<1.9
APP-15	PV-APP-15-1017	10/26/2017	Cesium-137	<1.3
APP-15	PV-APP-15-1017	10/26/2017	Cobalt-60	<1.2
APP-15	PV-APP-15-1017	10/26/2017	Tritium	<290
APP-18	PV-APP-18-0417	4/13/2017	Cesium-134	<1.5
APP-18	PV-APP-18-0417	4/13/2017	Cesium-137	<1.5
APP-18	PV-APP-18-0417	4/13/2017	Cobalt-60	<1
APP-18	PV-APP-18-0417	4/13/2017	Tritium	<308
APP-18	PV-APP-18-1017	10/26/2017	Cesium-134	<1.6
APP-18	PV-APP-18-1017	10/26/2017	Cesium-137	<0.8
APP-18	PV-APP-18-1017	10/26/2017	Cobalt-60	<0.3

Table 46: Continued				
Monitoring Well ID	**Sample ID**	**Sample Date**	**Radionuclide**	**Concentration (pCi/L)**
APP-18	PV-APP-18-1017	10/26/2017	Tritium	<290
APP-19	PV-APP-19-0417	4/13/2017	Cesium-134	<1.6
APP-19	PV-APP-19-0417	4/13/2017	Cesium-137	<1.4
APP-19	PV-APP-19-0417	4/13/2017	Cobalt-60	<0.7
APP-19	PV-APP-19-0417	4/13/2017	Tritium	<308
APP-19	PV-APP-19-1017	10/26/2017	Cesium-134	<1.3
APP-19	PV-APP-19-1017	10/26/2017	Cesium-137	<1.2
APP-19	PV-APP-19-1017	10/26/2017	Cobalt-60	<0.3
APP-19	PV-APP-19-1017	10/26/2017	Tritium	<290
APP-20	PV-APP-20-0417	4/13/2017	Cesium-134	<0.9
APP-20	PV-APP-20-0417	4/13/2017	Cesium-137	<0.8
APP-20	PV-APP-20-0417	4/13/2017	Cobalt-60	<0.7
APP-20	PV-APP-20-0417	4/13/2017	Tritium	<308
APP-20	PV-APP-20-1017	10/25/2017	Cesium-134	<1.8
APP-20	PV-APP-20-1017	10/25/2017	Cesium-137	<1.3
APP-20	PV-APP-20-1017	10/25/2017	Cobalt-60	<1.1
APP-20	PV-APP-20-1017	10/25/2017	Tritium	<301
APP-21	PV-APP-21-0417	4/13/2017	Cesium-134	<1.1
APP-21	PV-APP-21-0417	4/13/2017	Cesium-137	<1.1
APP-21	PV-APP-21-0417	4/13/2017	Cobalt-60	<0.8
APP-21	PV-APP-21-0417	4/13/2017	Tritium	<308
APP-21	PV-APP-21-1017	10/25/2017	Cesium-134	<1.1
APP-21	PV-APP-21-1017	10/25/2017	Cesium-137	<1.1
APP-21	PV-APP-21-1017	10/25/2017	Cobalt-60	<0.8
APP-21	PV-APP-21-1017	10/25/2017	Tritium	<301
APP-22	PV-APP-22-0417	4/19/2017	Cesium-134	<1.1

Table 46: Continued				
Monitoring Well ID	**Sample ID**	**Sample Date**	**Radionuclide**	**Concentration (pCi/L)**
APP-22	PV-APP-22-0417	4/19/2017	Cesium-137	<0.9
APP-22	PV-APP-22-0417	4/19/2017	Cobalt-60	<0.5
APP-22	PV-APP-22-0417	4/19/2017	Tritium	<308
APP-22	PV-APP-22-1017	10/26/2017	Cesium-134	<1.2
APP-22	PV-APP-22-1017	10/26/2017	Cesium-137	<1.7
APP-22	PV-APP-22-1017	10/26/2017	Cobalt-60	<1.2
APP-22	PV-APP-22-1017	10/26/2017	Tritium	<290
APP-22	PV-FD-01-1017	10/26/2017	Cesium-134	<1.5
APP-22	PV-FD-01-1017	10/26/2017	Cesium-137	<1.6
APP-22	PV-FD-01-1017	10/26/2017	Cobalt-60	<0.6
APP-22	PV-FD-01-1017	10/26/2017	Tritium	<290
APP-23	PV-APP-23-0417	4/13/2017	Cesium-134	<0.9
APP-23	PV-APP-23-0417	4/13/2017	Cesium-137	<0.5
APP-23	PV-APP-23-0417	4/13/2017	Cobalt-60	<0.9
APP-23	PV-APP-23-0417	4/13/2017	Tritium	<308
APP-23	PV-FD-01-0417	4/13/2017	Cesium-134	<1.2
APP-23	PV-FD-01-0417	4/13/2017	Cesium-137	<1.1
APP-23	PV-FD-01-0417	4/13/2017	Cobalt-60	<1.2
APP-23	PV-FD-01-0417	4/13/2017	Tritium	<308
APP-23	PV-APP-23-1017	10/25/2017	Cesium-134	<1.3
APP-23	PV-APP-23-1017	10/25/2017	Cesium-137	<1.7
APP-23	PV-APP-23-1017	10/25/2017	Cobalt-60	<0.9
APP-23	PV-APP-23-1017	10/25/2017	Tritium	<290
APP-3	PV-APP-3-0417	4/19/2017	Cesium-134	<1.8
APP-3	PV-APP-3-0417	4/19/2017	Cesium-137	<1.6
APP-3	PV-APP-3-0417	4/19/2017	Cobalt-60	<0.7
APP-3	PV-APP-3-0417	4/19/2017	Tritium	<308
APP-4R	PV-APP-4R-0417	4/19/2017	Cesium-134	<1.3
APP-4R	PV-APP-4R-0417	4/19/2017	Cesium-137	<0.7
APP-4R	PV-APP-4R-0417	4/19/2017	Cobalt-60	<1.1
APP-4R	PV-APP-4R-0417	4/19/2017	Tritium	<308

Table 46: Continued				
Monitoring Well ID	**Sample ID**	**Sample Date**	**Radionuclide**	**Concentration (pCi/L)**
APP-4R	PV-APP-4R-1017	10/26/2017	Cesium-134	<1.8
APP-4R	PV-APP-4R-1017	10/26/2017	Cesium-137	<1.2
APP-4R	PV-APP-4R-1017	10/26/2017	Cobalt-60	<0.6
APP-4R	PV-APP-4R-1017	10/26/2017	Tritium	<290
APP-5	PV-APP-5-0417	4/19/2017	Cesium-134	<1.3
APP-5	PV-APP-5-0417	4/19/2017	Cesium-137	<1.6
APP-5	PV-APP-5-0417	4/19/2017	Cobalt-60	<0.4
APP-5	PV-APP-5-0417	4/19/2017	Tritium	<308
APP-7	PV-APP-7-0417	4/13/2017	Cesium-134	<1.3
APP-7	PV-APP-7-0417	4/13/2017	Cesium-137	<1
APP-7	PV-APP-7-0417	4/13/2017	Cobalt-60	<0.5
APP-7	PV-APP-7-0417	4/13/2017	Tritium	<308
APP-9	PV-APP-9-0317	3/29/2017	Cesium-134	<1.2
APP-9	PV-APP-9-0317	3/29/2017	Cesium-137	<0.9
APP-9	PV-APP-9-0317	3/29/2017	Cobalt-60	<0.6
APP-9	PV-APP-9-0317	3/29/2017	Tritium	<259
APP-9	PV-APP-9-0517	5/19/2017	Cesium-134	<1
APP-9	PV-APP-9-0517	5/19/2017	Cesium-137	<0.6
APP-9	PV-APP-9-0517	5/19/2017	Cobalt-60	<0.4
APP-9	PV-APP-9-0517	5/19/2017	Tritium	<264
APP-9	PV-APP-9-0717	7/26/2017	Cesium-134	<1.1
APP-9	PV-APP-9-0717	7/26/2017	Cesium-137	<1.3
APP-9	PV-APP-9-0717	7/26/2017	Cobalt-60	<1
APP-9	PV-APP-9-0717	7/26/2017	Tritium	<287
APP-9	PV-APP-9-1017	10/24/2017	Cesium-134	<1.7
APP-9	PV-APP-9-1017	10/24/2017	Cesium-137	<1.4
APP-9	PV-APP-9-1017	10/24/2017	Cobalt-60	<1.2
APP-9	PV-APP-9-1017	10/24/2017	Tritium	<290
PV-14H	PV-PV-14H-0417	4/18/2017	Cesium-134	<1.1
PV-14H	PV-PV-14H-0417	4/18/2017	Cesium-137	<1.1
PV-14H	PV-PV-14H-0417	4/18/2017	Cobalt-60	<0.4
PV-14H	PV-PV-14H-0417	4/18/2017	Tritium	<294
PV-14H	PV-FD-02-0417	4/18/2017	Cesium-134	<1
PV-14H	PV-FD-02-0417	4/18/2017	Cesium-137	<0.7
PV-14H	PV-FD-02-0417	4/18/2017	Cobalt-60	<0.5
PV-14H	PV-FD-02-0417	4/18/2017	Tritium	<294
PV-14H	PV-PV-14H-1017	10/24/2017	Cesium-134	<1

Table 46: Continued				
Monitoring Well ID	**Sample ID**	**Sample Date**	**Radionuclide**	**Concentration (pCi/L)**
PV-14H	PV-PV-14H-1017	10/24/2017	Cesium-137	<0.5
PV-14H	PV-PV-14H-1017	10/24/2017	Cobalt-60	<0.9
PV-14H	PV-PV-14H-1017	10/24/2017	Tritium	<290
PV-193A	PV-PV-193A-0417	4/19/2017	Cesium-134	<1.1
PV-193A	PV-PV-193A-0417	4/19/2017	Cesium-137	<0.7
PV-193A	PV-PV-193A-0417	4/19/2017	Cobalt-60	<0.3
PV-193A	PV-PV-193A-0417	4/19/2017	Tritium	<308
PV-195A	PV-PV-195A-0417	4/18/2017	Cesium-134	<1.4
PV-195A	PV-PV-195A-0417	4/18/2017	Cesium-137	<0.5
PV-195A	PV-PV-195A-0417	4/18/2017	Cobalt-60	<0.7
PV-195A	PV-PV-195A-0417	4/18/2017	Tritium	<294
PV-195A	PV-PV-195A-1017	10/26/2017	Cesium-134	<1.1
PV-195A	PV-PV-195A-1017	10/26/2017	Cesium-137	<0.4
PV-195A	PV-PV-195A-1017	10/26/2017	Cobalt-60	<1.3
PV-195A	PV-PV-195A-1017	10/26/2017	Tritium	<290
PV-198AR	PV-PV-198AR-0417	4/19/2017	Cesium-134	<1.3
PV-198AR	PV-PV-198AR-0417	4/19/2017	Cesium-137	<1.3
PV-198AR	PV-PV-198AR-0417	4/19/2017	Cobalt-60	<1.2
PV-198AR	PV-PV-198AR-0417	4/19/2017	Tritium	<308
PV-34H	PV-PV-34H-0417	4/19/2017	Cesium-134	<0.9
PV-34H	PV-PV-34H-0417	4/19/2017	Cesium-137	<0.7
PV-34H	PV-PV-34H-0417	4/19/2017	Cobalt-60	<0.3
PV-34H	PV-PV-34H-0417	4/19/2017	Tritium	<308
PV-Q8	PV-PV-Q8-0417	4/19/2017	Cesium-134	<1.6
PV-Q8	PV-PV-Q8-0417	4/19/2017	Cesium-137	<1.3
PV-Q8	PV-PV-Q8-0417	4/19/2017	Cobalt-60	<0.3
PV-Q8	PV-PV-Q8-0417	4/19/2017	Tritium	<308

Table 46: Continued

Monitoring Well ID	Sample ID	Sample Date	Radionuclide	Concentration (pCi/L)
PV-R2AR	PV-PV-R2AR-0417	4/13/2017	Cesium-134	<1
PV-R2AR	PV-PV-R2AR-0417	4/13/2017	Cesium-137	<0.4
PV-R2AR	PV-PV-R2AR-0417	4/13/2017	Cobalt-60	<0.4
PV-R2AR	PV-PV-R2AR-0417	4/13/2017	Tritium	<308
PV-R2AR	PV-PV-R2AR-1017	10/25/2017	Cesium-134	<0.9
PV-R2AR	PV-PV-R2AR-1017	10/25/2017	Cesium-137	<1.1
PV-R2AR	PV-PV-R2AR-1017	10/25/2017	Cobalt-60	<0.9
PV-R2AR	PV-PV-R2AR-1017	10/25/2017	Tritium	<290

APPENDIX E: PERMITS ADJUSTED IN 2017

PERMITS ADJUSTED IN 2017

The following adjustments were made while developing the 2017 ARERR.

The tritium activity listed on Plant Vent permits 20171143, 20171146, 20171151, 20172054, 20172060, 20172067, and 20172070 because tritium activity was also accounted for with the Refueling Purge permits.

The tritium activity on permits 20172015, 20172041, 20172044, 20172049, 20172052, and 20173085 was adjusted because the reported activity was the result of interference from the operation of the boric acid concentrator (BAC).

Permits having a release duration greater than 216 hours were accounted for as continuous release.

APPENDIX F: CORRECTIONS TO 2012-2016 ARERRs

2012 ARERR Errata

The Ar-41 activity on Permit 20122143 was adjusted in the report to account for decay between the sample date/time and the beginning of the release and source term being limited to one containment volume.

The Ar-41 activity on Permit 20123023 was adjusted in the report to account for the duration of the gaseous radwaste leak (132 min.) vs the full duration of the permit (175.7 hrs).

The Ar-41 activity on Permit 20123071 was adjusted in the report to account for the duration of the gaseous radwaste leak (32 min.) vs the full duration of the permit (168.42 hrs).

The Ar-41 activity on Permit 20123170 was adjusted in the report to account for the duration of the gaseous radwaste leak (75 min.) vs the full duration of the permit (166.92 hrs).

The Ar-41 activity on Permit 20123080 was adjusted in the report to account for the duration of the gaseous radwaste leak (~311 min.) vs the full duration of the permit (169 hrs).

The tritium activity on the following permits was not accounted for in the report because the reported activity was the result of refueling activities and the tritium activity was already accounted for on Refueling Purge batch permits: 20123041, 20123047, and 20123050.

The Xe-133, Xe-133m and Xe-135 activity was adjusted in the report to account for the release of the pressurizer steam space volume (3.67E+07 cc) vs a continuous discharge of the pressurizer steam space activity for the duration of the permit (5.11E+12 cc).

Permits having a duration greater than 216 hours were accounted for as continuous release.

Table 1: Evaporation Pond Data was revised to correct an error when calculating the Average Tritium Concentration.

Site Boundary inhalation doses were calculated with unit specific X/Q and the entire estimated C-14 released.

The following pages contain the corrections to the 2012 ARERR.

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 261 acres which is divided into three segments: Pond 1A (131 acres), Pond 1B (77.5 acres) and Pond 1C (52.5 acres). This equates to 3.22E+11 cc evaporated from Pond One for each of the first and fourth quarters and 8.85E+11 cc evaporated for each of the second and third quarters. Evaporation Pond Two is approximately 232 acres which is divided into three segments: Pond 2A (117 acres), Pond 2B (87 acres) and Pond 2C (30 acres). The amount evaporated from Pond Two is 2.86E+11 cc for each of the first and fourth quarters and 7.87E+11 cc for each of the second and third quarters.

Evaporation Pond Three is constructed of two smaller ponds of 90 acres each (3A and 3B). The amount evaporated from each section of Pond Three is 1.11E+11 cc for each of the first and fourth quarters and 3.05E+11 cc for each of the secondand third quarters.

Using a site boundary X/Q of 5.0E-05 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 method used for the setpoint values are more reliable than basing the setpoints upon the constantly varying values of 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.

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 comesfrom 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: NCRPReport No. 160, Table 1.1.

The PVNGS calculated production of carbon-14 is 18.5 Curies per operating cycle (500 days) or 13.5 curies per year. The 13.5 curies will be divided equally between each quarter (3.38 curies per reactor). The estimated C-14 activity is included in all of the inhalation and ingestion dose calculations.

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 bemade only after summing both liquid and gaseous tritium curies released.

10.6 Dose Summary

Dose for 2012 was primarily due to the release of tritium. Tritium production is estimated to be 1000 curies per Reactor Unit per year. In order to control plant tritium concentrations, tritium releases should match tritium production. For 2012, PVNGS released a total of 1980 curies of tritium (see Table 39).

Table 1: Evaporation Pond Data					
Evaporation Pond 1(1A, 1B, 1C)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	3.22E+11	8.85E+11	8.85E+11	3.22E+11	
Tritium Concentration (uCi/cc)	N/A	N/A	N/A	N/A	
Tritium Curies	N/A	N/A	N/A	N/A	NA
Evaporation Pond 2 (2A and 2B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.52E+11	6.92E+11	6.92E+11	2.52E+11	
Average Tritium Concentration (uCi/cc)	1.00E-06	1.02E-06	1.11E-06	1.04E-06	
Tritium curies	2.53E-01	7.09E-01	7.67E-01	2.62E-01	1.99E+00
Evaporation Pond 3 (3A and 3B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.20E+11	6.04E+11	6.04E+11	2.20E+11	
Average Tritium Concentration (uCi/cc)	8.03E-07	8.24E-07	9.45E-07	7.31E-07	
Tritium curies	1.76E-01	4.97E-01	5.71E-01	1.60E-01	1.40E+00
Dose (mRem)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Pond 1	NA	NA	NA	NA	NA
Pond 2	3.50E-03	9.84E-03	1.06E-02	3.63E-03	2.76E-02
Pond 3	2.44E-03	6.90E-03	7.91E-03	2.23E-03	1.95E-02
Total	5.95E-03	1.67E-02	1.85E-02	5.85E-03	4.71E-02

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	5.04E-02	4.48E-02	4.89E-02	5.74E-02	2.01E-01	3.54E+01
2. Average release rate for period	µCi/sec	6.41E-03	5.70E-03	6.15E-03	7.22E-03	6.37E-03	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
B. Iodine 131							
1. Total Iodine 131	Ci	1.90E-07	<LLD	<LLD	<LLD	1.90E-07	3.32E+01
2. Average release rate for period	µCi/sec	2.44E-08	<LLD	<LLD	<LLD	6.02E-09	
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	5.28E-07	8.67E-07	1.04E-07	<LLD	1.50E-06	3.43E+01
2. Average release rate for period	µCi/sec	6.71E-08	1.10E-07	1.31E-08	<LLD	4.74E-08	
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	1.62E+01	5.39E+01	1.65E+01	1.05E+02	1.92E+02	3.85E+01
2. Average release rate for period	µCi/sec	2.06E+00	6.85E+00	2.08E+00	1.32E+01	6.06E+00	
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 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	5.28E-07	< LLD	< LLD	< LLD	5.28E-07
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	8.67E-07	< LLD	< LLD	8.67E-07
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	< LLD	< LLD	8.11E-08	<LLD	8.11E-08
Sr-90	Ci	< LLD	< LLD	2.30E-08	<LLD	2.30E-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	5.28E-07	8.67E-07	1.04E-07	<LLD	1.50E-06
4.Tritium						
H-3	Ci	1.62E+01	1.02E+01	1.65E+01	1.27E+01	5.55E+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	5.04E-02	4.48E-02	4.89E-02	5.74E-02	2.01E-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	5.04E-02	4.48E-02	4.89E-02	5.74E-02	2.01E-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 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	< 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	5.15E-03	4.37E+01	5.02E-03	9.25E+01	1.36E+02
Note 1 - Not required for batch releases						

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	<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	5.28E-07	<LLD	<LLD	<LLD	5.28E-07
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	8.67E-07	<LLD	<LLD	8.67E-07
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	8.11E-08	<LLD	8.11E-08
Sr-90	Ci	<LLD	<LLD	2.30E-08	<LLD	2.30E-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	5.28E-07	8.67E-07	1.04E-07	<LLD	1.50E-06
Total > 8 days	Ci	5.28E-07	8.67E-07	1.04E-07	<LLD	1.50E-06
4.Tritium						
H-3	Ci	1.62E+01	5.39E+01	1.65E+01	1.05E+02	1.92E+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	1.11E-04	9.86E-05	1.08E-04	1.26E-04	4.44E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.22E-03	1.97E-03	2.15E-03	2.53E-03	4.44E-03
Beta Air Dose	mrad	3.91E-05	3.48E-05	3.80E-05	4.46E-05	1.56E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	3.91E-04	3.48E-04	3.80E-04	4.46E-04	7.82E-04
Maximum Organ Dose (excluding skin)	mrem	2.87E-02	2.87E-02	2.87E-02	3.56E-02	1.15E-01
Age		Child	Child	Child	Teen	Child
Organ		Bone	Bone	Bone	T. Body	Bone
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	3.83E-01	3.83E-01	3.83E-01	4.75E-01	7.66E-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.

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	1.11E-01	2.39E-01	3.58E-01	3.91E+00	4.62E+00	3.54E+01
2. Average release rate for period	µCi/sec	1.41E-02	3.04E-02	4.51E-02	4.93E-01	1.46E-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	<LLD	<LLD	<LLD	6.87E-06	6.87E-06	3.32E+01
2. Average release rate for period	µCi/sec	<LLD	<LLD	<LLD	8.65E-07	2.17E-07	
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	9.50E-08	2.69E-06	5.36E-07	1.71E-04	1.74E-04	3.43E+01
2. Average release rate for period	µCi/sec	1.21E-08	3.42E-07	6.74E-08	2.15E-05	5.50E-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	1.44E+02	1.19E+02	5.91E+02	1.81E+02	1.04E+03	3.85E+01
2. Average release rate for period	µCi/sec	1.83E+01	1.51E+01	7.44E+01	2.28E+01	3.27E+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 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	< LLD	< LLD	< LLD	3.46E-05	3.46E-05
Co-60	Ci	< LLD	< LLD	< LLD	9.01E-06	9.01E-06
Cr-51	Ci	< LLD	< LLD	< LLD	1.08E-04	1.08E-04
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	5.07E-06	5.07E-06
Os-191	Ci	< LLD	< LLD	< LLD	7.73E-06	7.73E-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	1.23E-06	< LLD	< LLD	1.23E-06
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	6.96E-08	< LLD	< LLD	< LLD	6.96E-08
Sr-90	Ci	2.54E-08	< LLD	< LLD	< LLD	2.54E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	1.46E-06	5.36E-07	< LLD	2.00E-06
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	2.04E-06	2.04E-06
Total	Ci	9.50E-08	2.69E-06	5.36E-07	1.67E-04	1.70E-04
4. Tritium						
H-3	Ci	1.37E+01	1.23E+01	1.51E+01	1.61E+01	5.72E+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	8.74E-02	1.94E-01	2.94E-01	5.35E-02	6.28E-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	1.33E-03	1.33E-03
Xe-133	Ci	2.33E-02	4.47E-02	6.39E-02	1.47E+00	1.61E+00
Xe-133m	Ci	<LLD	<LLD	1.60E-07	8.67E-04	8.67E-04
Xe-135	Ci	2.62E-04	7.43E-04	8.12E-04	6.41E-02	6.59E-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	1.11E-01	2.39E-01	3.58E-01	1.59E+00	2.30E+00
2. Iodines						
I-131	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-132	Ci	< LLD	< LLD	< LLD	2.21E-07	2.21E-07
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	2.21E-07	2.21E-07

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	8.74E-02	1.94E-01	2.94E-01	5.35E-02	6.28E-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	1.33E-03	1.33E-03
Xe-133	Ci	2.33E-02	4.47E-02	6.39E-02	3.80E+00	3.93E+00
Xe-133m	Ci	< LLD	< LLD	1.60E-07	8.67E-04	8.67E-04
Xe-135	Ci	2.62E-04	7.43E-04	8.12E-04	6.41E-02	6.59E-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	1.11E-01	2.39E-01	3.58E-01	3.91E+00	4.62E+00
2. Iodines						
I-131	Ci	< LLD	< LLD	< LLD	6.87E-06	6.87E-06
I-132	Ci	< LLD	< LLD	< LLD	2.21E-07	2.21E-07
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	7.09E-06	7.09E-06

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	2.06E-04	4.55E-04	6.90E-04	4.89E-04	1.84E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	4.11E-03	9.10E-03	1.38E-02	9.79E-03	1.84E-02
Beta Air Dose	mrad	8.04E-05	1.76E-04	2.65E-04	1.46E-03	1.98E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	8.04E-04	1.76E-03	2.65E-03	1.46E-02	9.92E-03
Maximum Organ Dose (excluding skin)	mrem	5.00E-02	4.20E-02	1.93E-01	6.21E-02	3.47E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Lung	T. Body	T. Body	Lung	Lung
ODCM Req. 4.2 Limit	%	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	6.67E-01	5.60E-01	2.57E+00	8.27E-01	2.31E+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 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	7.35E-01	1.28E-01	5.30E-02	3.78E-01	1.29E+00	3.54E+01
2. Average release rate for period	µCi/sec	9.35E-02	1.62E-02	6.67E-03	4.76E-02	4.09E-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	2.24E-05	4.62E-06	<LLD	<LLD	2.70E-05	3.32E+01
2. Average release rate for period	µCi/sec	2.84E-06	5.88E-07	<LLD	<LLD	8.52E-07	
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	2.74E-04	8.72E-05	8.79E-06	<LLD	3.70E-04	3.43E+01
2. Average release rate for period	µCi/sec	3.48E-05	1.11E-05	1.11E-06	<LLD	1.17E-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	2.79E+02	1.16E+02	1.34E+02	2.27E+02	7.56E+02	3.85E+01
2. Average release rate for period	µCi/sec	3.55E+01	1.48E+01	1.68E+01	2.86E+01	2.39E+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	2.07E-01	7.80E-02	<LLD	3.97E-02	3.25E-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	1.52E-01	<LLD	<LLD	2.80E-01	4.31E-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	3.59E-01	7.80E-02	<LLD	3.19E-01	7.56E-01
2. Iodines						
I-131	Ci	2.23E-05	4.62E-06	< LLD	< LLD	2.69E-05
I-132	Ci	3.32E-04	< LLD	< LLD	< LLD	3.32E-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	3.54E-04	4.62E-06	< LLD	< LLD	3.59E-04

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	6.73E-06	< LLD	< LLD	< LLD	6.73E-06
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-04	5.54E-05	8.70E-06	< LLD	1.74E-04
Co-60	Ci	6.36E-06	2.28E-06	< LLD	< LLD	8.64E-06
Cr-51	Ci	1.42E-04	2.20E-05	< LLD	< LLD	1.64E-04
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	2.13E-06	9.09E-07	< LLD	< LLD	3.04E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	4.31E-06	1.37E-06	< LLD	< LLD	5.68E-06
Os-191	Ci	3.37E-06	< LLD	< LLD	< LLD	3.37E-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	< LLD	< LLD	< LLD	< LLD	< LLD
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	2.33E-06	< LLD	< LLD	< LLD	2.33E-06
Total	Ci	2.76E-04	8.19E-05	8.70E-06	< LLD	3.67E-04
4. Tritium						
H-3	Ci	2.04E+01	2.72E+01	2.83E+01	2.05E+01	9.64E+01

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	4.91E-01	1.28E-01	5.30E-02	9.69E-02	7.68E-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	5.02E-05	<LLD	<LLD	<LLD	5.02E-05
Kr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	1.18E-03	<LLD	<LLD	<LLD	1.18E-03
Xe-133	Ci	9.09E-02	4.23E-05	<LLD	1.59E-03	9.26E-02
Xe-133m	Ci	8.13E-04	<LLD	<LLD	<LLD	8.13E-04
Xe-135	Ci	1.52E-01	<LLD	<LLD	2.80E-01	4.31E-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	7.35E-01	1.28E-01	5.30E-02	3.78E-01	1.29E+00
2. Iodines						
I-131	Ci	2.24E-05	4.62E-06	< LLD	< LLD	2.70E-05
I-132	Ci	3.34E-04	< LLD	< LLD	< LLD	3.34E-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	3.56E-04	4.62E-06	< LLD	< LLD	3.61E-04

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	6.73E-06	<LLD	<LLD	<LLD	6.73E-06
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	1.11E-04	5.78E-05	8.70E-06	<LLD	1.78E-04
Co-60	Ci	6.53E-06	2.50E-06	<LLD	<LLD	9.02E-06
Cr-51	Ci	1.43E-04	2.36E-05	<LLD	<LLD	1.67E-04
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	1.25E-08	<LLD	<LLD	<LLD	1.25E-08
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	2.14E-06	9.09E-07	<LLD	<LLD	3.05E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	4.44E-06	1.97E-06	<LLD	<LLD	6.40E-06
Os-191	Ci	3.37E-06	<LLD	<LLD	<LLD	3.37E-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	<LLD	<LLD	7.07E-08	<LLD	7.07E-08
Sr-90	Ci	<LLD	<LLD	2.08E-08	<LLD	2.08E-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	2.47E-06	4.04E-07	<LLD	<LLD	2.87E-06
Total	Ci	2.81E-04	8.72E-05	8.79E-06	<LLD	3.77E-04
Total > 8 days	Ci	2.74E-04	8.72E-05	8.79E-06	<LLD	3.70E-04
4. Tritium						
H-3	Ci	2.79E+02	1.16E+02	1.34E+02	2.27E+02	7.56E+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	1.44E-03	3.35E-04	1.39E-04	5.20E-04	2.44E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.88E-02	6.71E-03	2.79E-03	1.04E-02	2.44E-02
Beta Air Dose	mrad	5.25E-04	1.18E-04	4.91E-05	1.49E-04	8.41E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	5.25E-03	1.18E-03	4.91E-04	1.49E-03	4.21E-03
Maximum Organ Dose (excluding skin)	mrem	1.05E-01	4.65E-02	5.28E-02	8.65E-02	2.91E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Thyroid	Lung	Lung	T. Body	Thyroid
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	1.40E+00	6.20E-01	7.04E-01	1.15E+00	1.94E+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 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	2.07E-01	7.80E-02	<LLD	3.97E-02	3.25E-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	2.32E+00	2.32E+00
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	1.52E-01	<LLD	<LLD	2.80E-01	4.31E-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	3.59E-01	7.80E-02	<LLD	2.64E+00	3.08E+00
2. Iodines						
I-131	Ci	2.25E-05	4.62E-06	< LLD	6.87E-06	3.40E-05
I-132	Ci	3.32E-04	< LLD	< LLD	< LLD	3.32E-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	3.54E-04	4.62E-06	< LLD	6.87E-06	3.66E-04

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	6.73E-06	< LLD	< LLD	< LLD	6.73E-06
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-04	5.54E-05	8.70E-06	3.46E-05	2.09E-04
Co-60	Ci	6.36E-06	2.28E-06	< LLD	9.01E-06	1.76E-05
Cr-51	Ci	1.42E-04	2.20E-05	< LLD	1.08E-04	2.72E-04
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	2.13E-06	9.09E-07	< LLD	< LLD	3.04E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	4.31E-06	1.37E-06	< LLD	5.07E-06	1.08E-05
Os-191	Ci	3.37E-06	< LLD	< LLD	7.73E-06	1.11E-05
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	2.09E-06	< LLD	< LLD	2.09E-06
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	6.96E-08	< LLD	< LLD	< LLD	6.96E-08
Sr-90	Ci	2.54E-08	< LLD	< LLD	< LLD	2.54E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	1.46E-06	5.36E-07	< LLD	2.00E-06
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	2.33E-06	< LLD	< LLD	2.04E-06	4.37E-06
Total	Ci	2.77E-04	8.55E-05	9.24E-06	1.67E-04	5.39E-04
4. Tritium						
H-3	Ci	5.02E+01	4.97E+01	6.00E+01	4.88E+01	2.09E+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	4.21E-01	2.88E-01	3.96E-01	1.68E-01	1.27E+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	5.02E-05	<LLD	<LLD	<LLD	5.02E-05
Kr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	1.18E-03	<LLD	<LLD	1.33E-03	2.51E-03
Xe-133	Ci	1.14E-01	4.48E-02	6.39E-02	1.48E+00	1.70E+00
Xe-133m	Ci	8.13E-04	<LLD	1.60E-07	8.67E-04	1.68E-03
Xe-135	Ci	2.62E-04	7.43E-04	8.12E-04	6.41E-02	6.59E-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	5.38E-01	3.33E-01	4.60E-01	1.71E+00	3.04E+00
2. Iodines						
I-131	Ci	9.08E-08	<LLD	<LLD	<LLD	9.08E-08
I-132	Ci	1.74E-06	<LLD	<LLD	2.21E-07	1.97E-06
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	1.84E-06	<LLD	<LLD	2.21E-07	2.06E-06

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	6.28E-01	3.66E-01	3.96E-01	2.08E-01	1.60E+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	5.02E-05	<LLD	<LLD	<LLD	5.02E-05
Kr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	1.18E-03	<LLD	<LLD	1.33E-03	2.51E-03
Xe-133	Ci	1.14E-01	4.48E-02	6.39E-02	3.80E+00	4.02E+00
Xe-133m	Ci	8.13E-04	<LLD	1.60E-07	8.67E-04	1.68E-03
Xe-135	Ci	1.52E-01	7.43E-04	8.12E-04	3.44E-01	4.97E-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	8.97E-01	4.11E-01	4.60E-01	4.35E+00	6.12E+00
2. Iodines						
I-131	Ci	2.26E-05	4.62E-06	<LLD	6.87E-06	3.41E-05
I-132	Ci	3.34E-04	<LLD	<LLD	2.21E-07	3.34E-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	3.56E-04	4.62E-06	<LLD	7.09E-06	3.68E-04

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	6.73E-06	<LLD	<LLD	1.66E-06	8.39E-06
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	1.12E-04	5.78E-05	8.70E-06	3.57E-05	2.14E-04
Co-60	Ci	6.53E-06	2.50E-06	<LLD	9.17E-06	1.82E-05
Cr-51	Ci	1.43E-04	2.36E-05	<LLD	1.08E-04	2.75E-04
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	1.25E-08	<LLD	<LLD	<LLD	1.25E-08
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	2.14E-06	9.09E-07	<LLD	<LLD	3.05E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	4.44E-06	1.97E-06	<LLD	5.80E-06	1.22E-05
Os-191	Ci	3.37E-06	<LLD	<LLD	7.73E-06	1.11E-05
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	2.09E-06	<LLD	<LLD	2.09E-06
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	6.96E-08	<LLD	1.52E-07	<LLD	2.21E-07
Sr-90	Ci	2.54E-08	<LLD	4.38E-08	<LLD	6.92E-08
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	1.46E-06	5.36E-07	<LLD	2.00E-06
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	2.47E-06	4.04E-07	<LLD	3.95E-06	6.82E-06
Total	Ci	2.81E-04	9.08E-05	9.43E-06	1.72E-04	5.54E-04
Total > 8 days	Ci	2.74E-04	9.08E-05	9.43E-06	1.71E-04	5.45E-04
4. Tritium						
H-3	Ci	4.39E+02	2.89E+02	7.41E+02	5.14E+02	1.98E+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	3.25E-01	3.25E-01
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	2.32E+00	< LLD	2.32E+00
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	4.31E-01	4.31E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	<LLD	2.32E+00	7.56E-01	3.08E+00
2. Iodines					
I-131	Ci	1.90E-07	6.87E-06	2.69E-05	3.40E-05
I-132	Ci	< LLD	< LLD	3.32E-04	3.32E-04
I-133	Ci	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.90E-07	6.87E-06	3.59E-04	3.66E-04

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	6.73E-06	6.73E-06
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	5.28E-07	3.46E-05	1.74E-04	2.09E-04
Co-60	Ci	< LLD	9.01E-06	8.64E-06	1.76E-05
Cr-51	Ci	< LLD	1.08E-04	1.64E-04	2.72E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	3.04E-06	3.04E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	5.07E-06	5.68E-06	1.08E-05
Os-191	Ci	< LLD	7.73E-06	3.37E-06	1.11E-05
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD
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	8.67E-07	1.23E-06	< LLD	2.09E-06
Sn-113m	Ci	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	< LLD	6.96E-08	< LLD	6.96E-08
Sr-90	Ci	< LLD	2.54E-08	< LLD	2.54E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	2.00E-06	< LLD	2.00E-06
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	2.04E-06	2.33E-06	4.37E-06
Total	Ci	1.39E-06	1.70E-04	3.67E-04	5.39E-04
4. Tritium					
H-3	Ci	5.51E+01	5.72E+01	9.64E+01	2.09E+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	2.01E-01	6.28E-01	4.43E-01	1.27E+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	5.02E-05	5.02E-05
Kr-89	Ci	<LLD	<LLD	<LLD	<LLD
Kr-90	Ci	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	<LLD	1.33E-03	1.18E-03	2.51E-03
Xe-133	Ci	<LLD	1.61E+00	9.26E-02	1.70E+00
Xe-133m	Ci	<LLD	8.67E-04	8.13E-04	1.68E-03
Xe-135	Ci	<LLD	6.59E-02	<LLD	6.59E-02
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-137	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	2.01E-01	2.30E+00	5.38E-01	3.04E+00
2. Iodines					
I-131	Ci	<LLD	<LLD	9.08E-08	9.08E-08
I-132	Ci	<LLD	2.21E-07	1.74E-06	1.97E-06
I-133	Ci	<LLD	<LLD	<LLD	<LLD
I-134	Ci	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	2.21E-07	1.84E-06	2.06E-06

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	2.01E-01	6.28E-01	7.68E-01	1.60E+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	5.02E-05	5.02E-05
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	1.33E-03	1.18E-03	2.51E-03
Xe-133	Ci	< LLD	3.93E+00	9.26E-02	4.02E+00
Xe-133m	Ci	< LLD	8.69E-04	8.13E-04	1.68E-03
Xe-135	Ci	< LLD	6.59E-02	4.31E-01	4.97E-01
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	2.01E-01	4.62E+00	1.29E+00	6.12E+00
2. Iodines					
I-131	Ci	1.90E-07	6.87E-06	2.59E-05	3.40E-05
I-132	Ci	< LLD	2.21E-07	3.34E-04	3.34E-04
I-133	Ci	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.90E-07	7.09E-06	3.61E-04	3.68E-04

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	<LLD	1.66E-06	6.73E-06	8.39E-06
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	5.28E-07	3.57E-05	1.78E-04	2.14E-04
Co-60	Ci	<LLD	9.17E-06	9.02E-06	1.82E-05
Cr-51	Ci	<LLD	1.08E-04	1.67E-04	2.75E-04
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	1.25E-08	1.25E-08
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	3.05E-06	3.05E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	5.80E-06	6.40E-06	1.22E-05
Os-191	Ci	<LLD	7.73E-06	3.37E-06	1.11E-05
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
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	8.67E-07	1.23E-06	<LLD	2.09E-06
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	8.11E-08	6.96E-08	7.07E-08	2.21E-07
Sr-90	Ci	2.30E-08	2.54E-08	2.08E-08	6.92E-08
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	2.00E-06	<LLD	2.00E-06
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	3.95E-06	2.87E-06	6.82E-06
Total	Ci	1.50E-06	1.76E-04	3.77E-04	5.54E-04
Total > 8 days	Ci	1.50E-06	1.74E-04	3.70E-04	5.45E-04
4. Tritium					
H-3	Ci	1.92E+02	1.04E+03	7.62E+02	1.98E+03

Table 43:
Doses To Special Locations For 2012
NA

ENERGY INFORMATION CENTER (EIC) was relocated to an offsite location in 2011.

Table 44:
Integrated Population Dose for 2012

January to March

JAN - MAR

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	4.55E-04 .01%	4.55E-04 .01%	4.55E-04 83.60%	4.55E-04 .01%	4.55E-04 .01%	4.55E-04 .01%	4.55E-04 .01%	1.07E-03 .02%
GROUND	7.25E-05 .00%	7.25E-05 .00%	7.25E-05 13.31%	7.25E-05 .00%	7.25E-05 .00%	7.25E-05 .00%	7.25E-05 .00%	8.52E-05 .00%
INHAL	1.48E+00 25.40%	1.48E+00 25.40%	5.27E-06 .97%	1.48E+00 25.40%	1.48E+00 25.40%	1.48E+00 25.41%	1.48E+00 25.40%	1.48E+00 25.40%
VEGET	3.77E+00 64.83%	3.77E+00 64.83%	1.13E-05 2.07%	3.77E+00 64.83%	3.77E+00 64.83%	3.78E+00 64.83%	3.77E+00 64.83%	3.77E+00 64.83%
COW MILK	3.86E-01 6.64%	3.86E-01 6.64%	2.80E-07 .05%	3.86E-01 6.64%	3.86E-01 6.64%	3.86E-01 6.64%	3.86E-01 6.64%	3.86E-01 6.64%
MEAT	1.81E-01 3.12%	1.82E-01 3.12%	2.28E-08 .00%	1.81E-01 3.12%	1.81E-01 3.12%	1.81E-01 3.12%	1.81E-01 3.12%	1.81E-01 3.12%
TOTAL	5.82E+00	5.82E+00	5.45E-04	5.82E+00	5.82E+00	5.82E+00	5.82E+00	5.82E+00
(1) PER CAPITA DOSE (REM)	2.97E-06	2.97E-06	2.78E-10	2.97E-06	2.97E-06	2.97E-06	2.97E-06	2.97E-06

April through June

APR - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.07E-04 .01%	2.07E-04 .01%	2.07E-04 81.77%	2.07E-04 .01%	2.07E-04 .01%	2.07E-04 .01%	2.07E-04 .01%	3.95E-04 .01%
GROUND	4.55E-05 .00%	4.55E-05 .00%	4.55E-05 17.97%	4.55E-05 .00%	4.55E-05 .00%	4.55E-05 .00%	4.55E-05 .00%	5.35E-05 .00%
INHAL	9.17E-01 34.81%	9.17E-01 34.81%	3.48E-07 .14%	9.17E-01 34.81%	9.17E-01 34.81%	9.17E-01 34.81%	9.17E-01 34.81%	9.17E-01 34.81%
VEGET	1.43E+00 54.22%	1.43E+00 54.22%	2.67E-07 .11%	1.43E+00 54.22%	1.43E+00 54.22%	1.43E+00 54.22%	1.43E+00 54.22%	1.43E+00 54.22%
COW MILK	2.30E-01 8.73%	2.30E-01 8.73%	5.06E-08 .02%	2.30E-01 8.73%	2.30E-01 8.73%	2.30E-01 8.73%	2.30E-01 8.73%	2.30E-01 8.73%
MEAT	5.88E-02 2.23%	5.88E-02 2.23%	9.06E-11 .00%	5.88E-02 2.23%	5.88E-02 2.23%	5.88E-02 2.23%	5.88E-02 2.23%	5.88E-02 2.23%
TOTAL	2.63E+00	2.63E+00	2.53E-04	2.63E+00	2.63E+00	2.63E+00	2.63E+00	2.63E+00
(1) PER CAPITA DOSE (REM)	1.34E-06	1.34E-06	1.29E-10	1.34E-06	1.34E-06	1.34E-06	1.34E-06	1.34E-06

Table 44: (continued)
Integrated Population Dose for 2012

January through June

JAN - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	6.62E-04 .01%	6.62E-04 .01%	6.62E-04 83.02%	6.62E-04 .01%	6.62E-04 .01%	6.62E-04 .01%	6.62E-04 .01%	1.46E-03 .02%
GROUND	1.18E-04 .00%	1.18E-04 .00%	1.18E-04 14.79%	1.18E-04 .00%	1.18E-04 .00%	1.18E-04 .00%	1.18E-04 .00%	1.39E-04 .00%
INHAL	2.40E+00 28.33%	2.40E+00 28.33%	5.62E-06 .70%	2.40E+00 28.33%	2.40E+00 28.33%	2.40E+00 28.34%	2.40E+00 28.34%	2.40E+00 28.33%
VEGET	5.20E+00 61.53%	5.20E+00 61.53%	1.15E-05 1.44%	5.20E+00 61.53%	5.20E+00 61.53%	5.20E+00 61.53%	5.20E+00 61.53%	5.20E+00 61.52%
COW MILK	6.16E-01 7.29%	6.16E-01 7.29%	3.31E-07 .04%	6.16E-01 7.29%	6.16E-01 7.29%	6.16E-01 7.29%	6.16E-01 7.29%	6.16E-01 7.29%
MEAT	2.40E-01 2.84%	2.40E-01 2.84%	2.29E-08 .00%	2.40E-01 2.84%	2.40E-01 2.84%	2.40E-01 2.84%	2.40E-01 2.84%	2.40E-01 2.84%
TOTAL	8.46E+00	8.46E+00	7.98E-04	8.46E+00	8.46E+00	8.46E+00	8.46E+00	8.46E+00
(1) PER CAPITA DOSE (REM)	4.32E-06	4.32E-06	4.07E-10	4.32E-06	4.32E-06	4.32E-06	4.32E-06	4.32E-06

July through September

JUL - SEP

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	3.56E-05 .00%	3.56E-05 .00%	3.56E-05 60.83%	3.56E-05 .00%	3.56E-05 .00%	3.56E-05 .00%	3.56E-05 .00%	6.32E-05 .00%
GROUND	2.00E-06 .00%	2.00E-06 .00%	2.00E-06 3.42%	2.00E-06 .00%	2.00E-06 .00%	2.00E-06 .00%	2.00E-06 .00%	2.35E-06 .00%
INHAL	1.62E+00 35.70%	1.62E+00 35.70%	3.85E-06 6.59%	1.62E+00 35.70%	1.62E+00 35.70%	1.62E+00 35.70%	1.62E+00 35.70%	1.62E+00 35.70%
VEGET	2.40E+00 53.04%	2.40E+00 53.04%	1.67E-05 28.59%	2.40E+00 53.04%	2.40E+00 53.04%	2.40E+00 53.04%	2.40E+00 53.04%	2.40E+00 53.04%
COW MILK	4.13E-01 9.14%	4.13E-01 9.14%	3.05E-07 .52%	4.13E-01 9.14%	4.13E-01 9.14%	4.13E-01 9.14%	4.13E-01 9.14%	4.13E-01 9.14%
MEAT	9.63E-02 2.13%	9.63E-02 2.13%	2.70E-08 .05%	9.63E-02 2.13%	9.63E-02 2.13%	9.63E-02 2.13%	9.63E-02 2.13%	9.63E-02 2.13%
TOTAL	4.53E+00	4.53E+00	5.85E-05	4.53E+00	4.53E+00	4.53E+00	4.53E+00	4.53E+00
(1) PER CAPITA DOSE (REM)	2.31E-06	2.31E-06	2.99E-11	2.31E-06	2.31E-06	2.31E-06	2.31E-06	2.31E-06

Table 44: (continued)
Integrated Population Dose for 2012

October through December

OCT - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.24E-03 .03%	2.24E-03 .03%	2.24E-03 96.34%	2.24E-03 .03%	2.24E-03 .03%	2.24E-03 .03%	2.24E-03 .03%	7.42E-03 .09%
GROUND	8.31E-05 .00%	8.31E-05 .00%	8.31E-05 3.57%	8.31E-05 .00%	8.31E-05 .00%	8.31E-05 .00%	8.31E-05 .00%	9.77E-05 .00%
INHAL	2.24E+00 26.15%	2.24E+00 26.15%	1.53E-06 .07%	2.24E+00 26.15%	2.24E+00 26.15%	2.24E+00 26.15%	2.24E+00 26.15%	2.24E+00 26.13%
VEGET	5.44E+00 63.60%	5.45E+00 63.60%	4.43E-07 .02%	5.44E+00 63.60%	5.44E+00 63.60%	5.45E+00 63.60%	5.44E+00 63.60%	5.44E+00 63.57%
COW MILK	6.14E-01 7.17%	6.14E-01 7.17%	5.64E-08 .00%	6.14E-01 7.17%	6.14E-01 7.17%	6.14E-01 7.17%	6.14E-01 7.17%	6.14E-01 7.17%
MEAT	2.61E-01 3.05%	2.61E-01 3.05%	4.58E-10 .00%	2.61E-01 3.05%	2.61E-01 3.05%	2.61E-01 3.05%	2.61E-01 3.05%	2.61E-01 3.05%
TOTAL	8.56E+00	8.56E+00	2.32E-03	8.56E+00	8.56E+00	8.56E+00	8.56E+00	8.57E+00
(1) PER CAPITA DOSE (REM)	4.37E-06	4.37E-06	1.18E-09	4.37E-06	4.37E-06	4.37E-06	4.37E-06	4.37E-06

July through December

JUL - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.28E-03 .02%	2.28E-03 .02%	2.28E-03 95.47%	2.28E-03 .02%	2.28E-03 .02%	2.28E-03 .02%	2.28E-03 .02%	7.48E-03 .06%
GROUND	8.51E-05 .00%	8.51E-05 .00%	8.51E-05 3.57%	8.51E-05 .00%	8.51E-05 .00%	8.51E-05 .00%	8.51E-05 .00%	1.00E-04 .00%
INHAL	3.85E+00 29.45%	3.85E+00 29.45%	5.39E-06 .23%	3.85E+00 29.45%	3.85E+00 29.45%	3.85E+00 29.45%	3.85E+00 29.45%	3.85E+00 29.44%
VEGET	7.85E+00 59.95%	7.85E+00 59.95%	1.72E-05 .72%	7.85E+00 59.95%	7.85E+00 59.95%	7.85E+00 59.95%	7.85E+00 59.95%	7.85E+00 59.93%
COW MILK	1.03E+00 7.85%	1.03E+00 7.85%	3.61E-07 .02%	1.03E+00 7.85%	1.03E+00 7.85%	1.03E+00 7.85%	1.03E+00 7.85%	1.03E+00 7.85%
MEAT	3.58E-01 2.73%	3.58E-01 2.73%	2.75E-08 .00%	3.58E-01 2.73%	3.58E-01 2.73%	3.58E-01 2.73%	3.58E-01 2.73%	3.58E-01 2.73%
TOTAL	1.31E+01	1.31E+01	2.38E-03	1.31E+01	1.31E+01	1.31E+01	1.31E+01	1.31E+01
(1) PER CAPITA DOSE (REM)	6.69E-06	6.69E-06	1.21E-09	6.69E-06	6.69E-06	6.69E-06	6.69E-06	6.69E-06

Table 44: (continued)
Integrated Population Dose for 2012

January through December

JAN - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.94E-03 .01%	2.94E-03 .01%	2.94E-03 92.34%	2.94E-03 .01%	2.94E-03 .01%	2.94E-03 .01%	2.94E-03 .01%	8.95E-03 .04%
GROUND	2.03E-04 .00%	2.03E-04 .00%	2.03E-04 6.38%	2.03E-04 .00%	2.03E-04 .00%	2.03E-04 .00%	2.03E-04 .00%	2.39E-04 .00%
INHAL	6.25E+00 29.01%	6.25E+00 29.01%	1.10E-05 .35%	6.25E+00 29.01%	6.25E+00 29.01%	6.25E+00 29.01%	6.25E+00 29.01%	6.25E+00 29.00%
VEGET	1.30E+01 60.57%	1.30E+01 60.57%	2.87E-05 .90%	1.30E+01 60.57%	1.30E+01 60.57%	1.30E+01 60.57%	1.30E+01 60.57%	1.30E+01 60.55%
COW MILK	1.64E+00 7.63%	1.64E+00 7.63%	6.92E-07 .02%	1.64E+00 7.63%	1.64E+00 7.63%	1.64E+00 7.63%	1.64E+00 7.63%	1.64E+00 7.63%
MEAT	5.98E-01 2.78%	5.98E-01 2.78%	5.04E-08 .00%	5.98E-01 2.78%	5.98E-01 2.78%	5.98E-01 2.77%	5.98E-01 2.78%	5.98E-01 2.77%
TOTAL	2.15E+01	2.15E+01	3.18E-03	2.15E+01	2.15E+01	2.15E+01	2.15E+01	2.15E+01
(1) PER CAPITA DOSE (REM)	1.10E-05	1.10E-05	1.62E-09	1.10E-05	1.10E-05	1.10E-05	1.10E-05	1.10E-05

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

Table 45:
Summary of Individual Doses for 2012
Radiation Doses At And Beyond The Site Boundary

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	1.36E-03	3.15E-04	7.10E-05	1.12E-03	2.80E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.72E-02	6.30E-03	1.42E-03	2.24E-02	2.80E-02
Beta Air Dose	mrad	5.78E-04	1.16E-04	2.50E-05	1.65E-03	2.35E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	5.78E-03	1.16E-03	2.50E-04	1.65E-02	1.17E-02
Maximum Individual						
Total Body	mrem	9.03E-04	2.10E-04	4.73E-05	7.08E-04	1.83E-03
Skin	mrem	1.51E-03	3.37E-04	7.57E-05	1.56E-03	3.42E-03
Location						
Unit 1	miles	1.70 SSE	1.40 SSW	1.27 SE	1.70 SSE	1.70 SSE
Unit 2	miles	1.88 SSE	1.14 SSW	1.31 SE	1.88 SSE	1.88 SSE
Unit 3	miles	1.73 SSE	1.00 SSW	1.40 SE	1.73 SSE	1.73 SSE
Maximum Organ Dose(1) From All Radionuclides						
	Age	Child	Child	Child	Child	Child
	Organ	Bone	Bone	Bone	Bone	Bone
	mrem	1.02E+00	1.47E+00	1.54E+00	2.04E+00	5.68E+00
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	1.36E+01	1.96E+01	2.05E+01	2.72E+01	3.79E+01
Location						
Unit 1	miles	2.43 ENE	2.43 ENE	2.43 ENE	2.43 ENE	2.43 ENE
Unit 2	miles	2.63 ENE	2.63 ENE	2.63 ENE	2.63 ENE	2.63 ENE
Unit 3	miles	2.80 ENE	2.80 ENE	2.80 ENE	2.80 ENE	2.80 ENE
Maximum Organ Dose(1) From All Radionuclides Excluding C-14						
	Age	Teen	Child	Child	Teen	Teen
	Organ	Thyroid	Thyroid	Thyroid	Thyroid	Thyroid
	mrem	1.50E-01	6.63E-02	1.29E-01	1.77E-01	4.31E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	2.00E-02	8.84E-03	1.72E-02	2.36E-02	2.87E-02
Unit 1	miles	2.74 S	2.43 ENE	2.43 ENE	2.74 S	2.74 S
Unit 2	miles	2.56 S	2.63 ENE	2.63 ENE	2.56 S	2.56 S
Unit 3	miles	2.35 S	2.80 ENE	2.80 ENE	2.35 S	2.35 S
Organ Dose from tritium only for Unit 2 location above	mrem	1.49E-01	6.62E-02	1.29E-01	1.76E-01	4.29E-01
Fraction of organ dose from tritum only for Unit 2 location above	%	99.33	99.85	100.00	99.44	99.54
X/Q for Unit 2 location above	sec/m^3	8.05E-06	1.17E-06	8.80E-07	8.36E-06	5.49E-06
D/Q for Unit 2 location above	m-2	2.90E-09	1.97E-09	1.76E-09	2.42E-09	1.86E-09

(1) Excluding skin

(2) 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

2013 ARERR Errata

The following permits had the Sr-89 activity removed from the report because the reported activity was based on laboratory results that were below the reported sample MDA: 20133002, 20133005, 20133007, 20133009, 20133014, 20133016, 20133018, 20133021, 20133024, 20133027, 20133029, 20133031, 20133035, 20133037, 20133038, 20133040, 20133041, 20133043, 20133044, 20133045, 20133046, 20133049, 20133051, 20133052, 20133054, 20133055, 20133057, 20133059, 20133060, 20133061, 20133063, 20133065, 20133066, 20133067, 20133068, 20133069, 20133070, 20133071, 20133073, 20133075, 20133078, 20133081, 20133083, 20133087, 20133092, 20133094, 20133097, 20133099, 20133104, 20133111, 20133114 and 20133117.

The following permits had the Sr-90 activity removed from the report because the reported activity was based on laboratory results that were below the reported sample MDA: 20131001, 20131004, 20131007, 20131009, 20131012, 20131015, 20131019, 20131022, 20131026, 20131028, 20131031, 20131035, 20131038, 20133002, 20133005, 20133007, 20133009, 20133014, 20133016, 20133018, 20133021, 20133024, 20133027, 20133029, 20133031, 20133035, 20131045, 20131047, 20131051, 20131061, 20131066, 20131068, 20131071, 20131073, 20131077, 20131080, 20131082, 20131085, 20131087, 20131124, 20131125, 20131128, 20131130, 20131131, 20131132, 20131133, 20131134, 20131135, 20131139, 20131140, 20131142, 20131143, 20131144, 20131145, 20131146, 20131147, 20131148, 20131149, 20131151, 20131153, 20131154, 20131155, 20131156, 20131157, 20131158, 20131159, 20131163, 20132001, 20132004, 20132006, 20132008, 20132011, 20132014, 20132017, 20132019, 20132022, 20132027, 20132029, 20132032, 20132035, 20132076, 20132078, 20132082, 20132084, 20132089, 20132091, 20132093, 20132096, 20132098, 20132101, 20132105, 20132108, 20132111, 20132115, 20132116, 20132119, 20132121, 20132124, 20132126, 20132129, 20132131, 20132134, 20132137, 20132141, 20132145, 20132150, 20132153, 20132156, 20133001, 20133003, 20133006, 20133008, 20133012, 20133015, 20133017, 20133020, 20133023, 20133026, 20133028, 20133030, 20133034, 20133120, 20133125, 20133127, 20133132, 20133138, 20133141, 20133144, 20133149, 20133153, 20133156, 20133159, 20133161 and 20133163.

The following permits had the tritium activity removed from the report because the reported tritium activity was the result of interference from a BAC release, which is accounted for on the boric acid concentrator batch permit: 20131045, 20131047, 20131051, 20131061, 20131066, 20131068, 20131071, 20131073, 20133132, 20133138, 20133141 and 20133144.

The following permits had the tritium removed from the report because the reported activity was the result of refueling activities and the tritium activity was already accounted for on Refueling Purge batch permits: 20133149, 20133153, 20133156 and 20133159.

The Ar-41 activity on permit 20133122 was adjusted in the report to account for decay and one Containment (CTMT) volume.

The Xe-133, Xe-133m and Xe-135 activity was adjusted in the report to account for the release of the pressurizer steam space volume (3.67E+07 cc) vs a continuous discharge of the pressurizer steam space activity for the duration of the permit (5.11E+12 cc).

Permits having a release duration greater than 216 hours were accounted for as a continuous release.

Table 1: Evaporation Pond Data was revised to correct an error when calculating the Average Tritium Concentration.

Site Boundary inhalation doses were calculated with unit specific X/Q and the entire estimated C-14 released.

The following pages contain the corrections to the 2013 ARERR.

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 261 acres which is divided into three segments: Pond 1A (131 acres), Pond 1B (77.5 acres) and Pond 1C (52.5 acres). This equates to 3.22E+11 cc evaporated from Pond One for each of the first and fourth quarters and 8.85E+11 cc evaporated for each of the second and third quarters. Evaporation Pond Two is approximately 232 acres which is divided into three segments: Pond 2A (117 acres), Pond 2B (87 acres) and Pond 2C (30 acres). The amount evaporated from Pond Two is 2.86E+11 cc for each of the first and fourth quarters and 7.87E+11 cc for each of the second and third quarters.

Evaporation Pond Three is constructed of two smaller ponds of 90 acres each (3A and 3B). The amount evaporated from each section of Pond Three is 1.11E+11 cc for each of the first and fourth quarters and 3.05E+11 cc for each of the second and third quarters.

Using a site boundary X/Q of 5.0E-05 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 method used for the setpoint values are more reliable than basing the setpoints upon the constantly varying values of 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.

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: NCRPReport No. 160, Table 1.1.

The PVNGS calculated production of carbon-14 is 18.5 Curies per operating cycle (500 days) or 13.5 curies per year. The 13.5 curies will be divided equally between each quarter (3.38 curies per reactor). The estimated C-14 activity is included in all of the inhalation and ingestion dose calculations.

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 Dose Summary

For radionuclides other than carbon-14, dose was primarily due to the release of tritium. Tritium production is estimated to be 1000 curies per Reactor Unit per year. In order to control plant tritium concentrations, tritium releases should match tritium production. For 2013, PVNGS released a total of 1800 curies of tritium (see Table 39).

Table 1: Evaporation Pond Data					
Evaporation Pond 1(1A, 1B, 1C)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	9.56E+10	2.63E+11	4.41E+11	3.22E+11	
Tritium Concentration (uCi/cc)	4.21E-07	1.00E-06	8.94E-07	1.06E-06	
Tritium Curies	4.02E-02	2.63E-01	3.94E-01	3.41E-01	1.04E+00
Evaporation Pond 2 (2A and 2B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.52E+11	6.92E+11	6.92E+11	2.52E+11	
Average Tritium Concentration (uCi/cc)	9.44E-07	1.22E-06	9.87E-07	1.00E-06	
Tritium curies	2.37E-01	8.41E-01	6.83E-01	2.53E-01	2.01E+00
Evaporation Pond 3 (3A and 3B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.20E+11	6.04E+11	6.04E+11	2.20E+11	
Average Tritium Concentration (uCi/cc)	5.01E-07	1.03E-06	7.47E-07	7.39E-07	
Tritium curies	1.10E-01	6.21E-01	4.51E-01	1.62E-01	1.34E+00
Dose (mRem)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Pond 1	5.58E-04	3.65E-03	5.47E-03	4.73E-03	1.44E-02
Pond 2	3.29E-03	1.17E-02	9.48E-03	3.50E-03	2.79E-02
Pond 3	1.53E-03	8.61E-03	6.25E-03	2.25E-03	1.86E-02
Total	5.38E-03	2.39E-02	2.12E-02	1.05E-02	6.10E-02

Table 2: Batch Release Data			
All times are in hours	Unit 1	Unit 2	Unit 3
January - June			
Number of batch releases	35	23	21
Total time period for batch releases	1497.36	161.60	216.599
Maximum time period for a batch release	168.33	100.92	84.47
Average time period for a batch release	42.78	7.03	10.31
Minimum time period for a batch release	0.22	0.33	0.43
July - December			
Number of batch releases	22	27	39
Total time period for batch releases	256.89	274.14	1872.35
Maximum time period for a batch release	129.97	117.55	168.00
Average time period for a batch release	11.68	10.15	48.01
Minimum time period for a batch release	0.28	0.36	0.06
January - December			
Number of batch releases	57	50	60
Total time period for batch releases	1754.25	435.74	2088.95
Maximum time period for a batch release	168.33	117.55	168.00
Average time period for a batch release	30.78	8.71	34.82
Minimum time period for a batch release	0.22	0.33	0.06

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	6.85E-01	2.66E-02	4.55E-02	5.03E-02	8.07E-01	3.54E+01
2. Average release rate for period	µCi/sec	8.81E-02	3.39E-03	5.73E-03	6.33E-03	2.56E-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	5.35E-06	5.61E-05	<LLD	<LLD	6.14E-05	3.32E+01
2. Average release rate for period	µCi/sec	6.89E-07	7.13E-06	<LLD	<LLD	1.95E-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	4.99E-05	4.92E-04	<LLD	<LLD	5.42E-04	3.43E+01
2. Average release rate for period	µCi/sec	6.41E-06	6.26E-05	<LLD	<LLD	1.72E-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	3.89E+02	2.11E+02	5.17E+01	1.15E+02	7.67E+02	3.85E+01
2. Average release rate for period	µCi/sec	5.00E+01	2.68E+01	6.50E+00	1.45E+01	2.43E+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 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	1.72E-05	1.31E-04	<LLD	<LLD	1.48E-04
Co-60	Ci	3.27E-07	3.04E-05	<LLD	<LLD	3.07E-05
Cr-51	Ci	3.03E-05	2.93E-04	<LLD	<LLD	3.23E-04
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	2.27E-06	<LLD	<LLD	2.27E-06
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	3.15E-06	<LLD	<LLD	3.15E-06
Mo-99	Ci	6.06E-07	<LLD	<LLD	<LLD	6.06E-07
Nb-95	Ci	<LLD	8.48E-06	<LLD	<LLD	8.48E-06
Os-191	Ci	<LLD	7.06E-06	<LLD	<LLD	7.06E-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	3.67E-07	<LLD	<LLD	3.67E-07
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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	1.03E-07	<LLD	<LLD	1.03E-07
Tc-99m	Ci	6.17E-07	<LLD	<LLD	<LLD	6.17E-07
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	6.03E-06	<LLD	<LLD	6.03E-06
Total	Ci	4.91E-05	4.82E-04	<LLD	<LLD	5.31E-04
4.Tritium						
H-3	Ci	1.73E+01	1.84E+01	1.87E+01	1.85E+01	7.30E+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	7.66E-02	2.62E-02	4.55E-02	5.03E-02	1.99E-01
Kr-83m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	3.20E-08	<LLD	<LLD	<LLD	3.20E-08
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	6.08E-01	4.45E-04	<LLD	<LLD	6.09E-01
Xe-133m	Ci	4.53E-07	<LLD	<LLD	<LLD	4.53E-07
Xe-135	Ci	1.35E-04	<LLD	<LLD	<LLD	1.35E-04
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	6.85E-01	2.66E-02	4.55E-02	5.03E-02	8.07E-01
2. Iodines						
I-131	Ci	< LLD	9.92E-07	< LLD	< LLD	9.92E-07
I-132	Ci	< LLD	1.50E-05	< LLD	< LLD	1.50E-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	1.60E-05	< LLD	< LLD	1.60E-05

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	7.66E-02	2.62E-02	4.55E-02	5.03E-02	1.99E-01
Kr-83m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	3.20E-08	<LLD	<LLD	<LLD	3.20E-08
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	6.08E-01	4.45E-04	<LLD	<LLD	6.09E-01
Xe-133m	Ci	4.53E-07	<LLD	<LLD	<LLD	4.53E-07
Xe-135	Ci	1.35E-04	<LLD	<LLD	<LLD	1.35E-04
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	6.85E-01	2.66E-02	4.55E-02	5.03E-02	8.07E-01
2. Iodines						
I-131	Ci	5.35E-06	5.61E-05	< LLD	< LLD	6.14E-05
I-132	Ci	1.39E-04	4.29E-04	< LLD	< LLD	5.68E-04
I-133	Ci	6.29E-06	< LLD	< LLD	< LLD	6.29E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.51E-04	4.85E-04	< LLD	< LLD	6.36E-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	4.19E-06	<LLD	<LLD	<LLD	4.19E-06
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	1.72E-05	1.34E-04	<LLD	<LLD	1.52E-04
Co-60	Ci	1.69E-06	3.06E-05	<LLD	<LLD	3.23E-05
Cr-51	Ci	3.03E-05	2.99E-04	<LLD	<LLD	3.29E-04
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	2.27E-06	<LLD	<LLD	2.27E-06
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	3.23E-06	<LLD	<LLD	3.23E-06
Mo-99	Ci	6.06E-07	<LLD	<LLD	<LLD	6.06E-07
Nb-95	Ci	<LLD	9.02E-06	<LLD	<LLD	9.02E-06
Os-191	Ci	<LLD	7.06E-06	<LLD	<LLD	7.06E-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	3.67E-07	<LLD	<LLD	3.67E-07
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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	1.03E-07	<LLD	<LLD	1.03E-07
Tc-99m	Ci	6.17E-07	<LLD	<LLD	<LLD	6.17E-07
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	6.49E-06	<LLD	<LLD	6.49E-06
Total	Ci	5.47E-05	4.92E-04	<LLD	<LLD	5.47E-04
Total > 8 days	Ci	4.99E-05	4.92E-04	<LLD	<LLD	5.42E-04
4.Tritium						
H-3	Ci	3.89E+02	2.11E+02	5.17E+01	1.15E+02	7.67E+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	2.16E-04	5.77E-05	1.00E-04	1.11E-04	4.85E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	4.32E-03	1.15E-03	2.01E-03	2.22E-03	4.85E-03
Beta Air Dose	mrad	2.73E-04	2.05E-05	3.54E-05	3.91E-05	3.68E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	2.73E-03	2.05E-04	3.54E-04	3.91E-04	1.84E-03
Maximum Organ Dose (excluding skin)	mrem	1.21E-01	6.77E-02	2.87E-02	3.86E-02	2.47E-01
Age		Teen	Teen	Child	Teen	Teen
Organ		Thyroid	Thyroid	Bone	T. Body	Thyroid
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	1.61E+00	9.03E-01	3.83E-01	5.14E-01	1.65E+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	8.73E-02	2.72E-01	1.41E-01	1.05E-01	6.05E-01	3.54E+01
2. Average release rate for period	µCi/sec	1.12E-02	3.46E-02	1.77E-02	1.32E-02	1.92E-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	< LLD	< LLD	< LLD	< LLD	< LLD	3.32E+01
2. Average release rate for period	µCi/sec	< LLD	< LLD	< LLD	< LLD	< LLD	
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	<LLD	<LLD	<LLD	<LLD	<LLD	3.43E+01
2. Average release rate for period	µCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	
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	1.78E+01	2.33E+01	1.44E+02	2.20E+01	2.08E+02	3.85E+01
2. Average release rate for period	µCi/sec	2.29E+00	2.96E+00	1.82E+01	2.76E+00	6.58E+00	
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 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	<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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
4. Tritium						
H-3	Ci	1.78E+01	2.32E+01	1.99E+01	2.17E+01	8.25E+01

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	< 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	2.73E-02	1.16E-01	1.25E+02	3.05E-01	1.25E+02
Note 1 - Not required for batch releases						

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	<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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total > 8 days	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
4. Tritium						
H-3	Ci	1.78E+01	2.33E+01	1.44E+02	2.20E+01	2.08E+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	1.88E-04	5.72E-04	2.98E-04	1.86E-04	1.24E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	3.75E-03	1.14E-02	5.95E-03	3.71E-03	1.24E-02
Beta Air Dose	mrad	6.86E-05	2.11E-04	1.10E-04	7.43E-05	4.64E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	6.86E-04	2.11E-03	1.10E-03	7.43E-04	2.32E-03
Maximum Organ Dose (excluding skin)	mrem	3.03E-02	3.03E-02	5.01E-02	3.03E-02	1.21E-01
Age		Child	Child	Teen	Child	Child
Organ		Bone	Bone	T. Body	Bone	Bone
ODCM Req. 4.2 Limit	%	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	4.05E-01	4.05E-01	6.68E-01	4.05E-01	8.09E-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.

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	5.83E-02	6.98E-02	2.05E-01	1.13E+00	1.47E+00	3.54E+01
2. Average release rate for period	µCi/sec	7.50E-03	8.88E-03	2.58E-02	1.43E-01	4.65E-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	< LLD	< LLD	< LLD	6.58E-06	6.58E-06	3.32E+01
2. Average release rate for period	µCi/sec	< LLD	< LLD	< LLD	8.28E-07	2.09E-07	
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	<LLD	1.33E-06	3.92E-07	3.49E-04	3.51E-04	3.43E+01
2. Average release rate for period	µCi/sec	4.52E-05	1.69E-07	4.93E-08	4.40E-05	1.11E-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	7.03E+01	1.35E+02	5.17E+02	9.83E+01	8.21E+02	3.85E+01
2. Average release rate for period	µCi/sec	9.04E+00	1.72E+01	6.50E+01	1.24E+01	2.60E+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 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	<LLD	7.41E-07	<LLD	1.22E-04	1.23E-04
Co-60	Ci	<LLD	4.08E-07	3.92E-07	1.35E-05	1.43E-05
Cr-51	Ci	<LLD	<LLD	<LLD	1.11E-04	1.11E-04
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	2.53E-06	2.53E-06
Mo-99	Ci	<LLD	1.81E-07	<LLD	<LLD	1.81E-07
Nb-95	Ci	<LLD	<LLD	<LLD	5.95E-06	5.95E-06
Os-191	Ci	<LLD	<LLD	<LLD	9.18E-06	9.18E-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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	1.84E-07	<LLD	<LLD	1.84E-07
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	1.95E-06	1.95E-06
Total	Ci	<LLD	1.51E-06	3.92E-07	2.66E-04	2.68E-04
4. Tritium						
H-3	Ci	1.49E+01	1.31E+01	1.73E+01	3.21E+01	7.74E+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	5.21E-02	6.17E-02	1.84E-01	3.55E-02	3.33E-01
Kr-83m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	3.95E-08	<LLD	3.95E-08
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	6.25E-03	8.00E-03	2.15E-02	1.07E+00	1.11E+00
Xe-133m	Ci	<LLD	<LLD	3.41E-07	8.04E-05	8.07E-05
Xe-135	Ci	<LLD	5.03E-05	1.67E-06	2.64E-02	2.65E-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	5.83E-02	6.98E-02	2.05E-01	1.13E+00	1.47E+00
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 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	5.21E-02	6.17E-02	1.84E-01	3.55E-02	3.33E-01
Kr-83m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	3.95E-08	<LLD	3.95E-08
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	6.25E-03	8.00E-03	2.15E-02	1.07E+00	1.11E+00
Xe-133m	Ci	<LLD	<LLD	3.41E-07	8.04E-05	8.07E-05
Xe-135	Ci	<LLD	5.03E-05	1.67E-06	2.64E-02	2.65E-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	5.83E-02	6.98E-02	2.05E-01	1.13E+00	1.47E+00
2. Iodines						
I-131	Ci	< LLD	< LLD	< LLD	6.58E-06	6.58E-06
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	6.58E-06	6.58E-06

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	4.15E-05	4.15E-05
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	7.41E-07	<LLD	1.47E-04	1.48E-04
Co-60	Ci	<LLD	4.08E-07	3.92E-07	3.04E-05	3.12E-05
Cr-51	Ci	<LLD	<LLD	<LLD	1.43E-04	1.43E-04
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	2.53E-06	2.53E-06
Mo-99	Ci	<LLD	1.81E-07	<LLD	<LLD	1.81E-07
Nb-95	Ci	<LLD	<LLD	<LLD	1.56E-05	1.56E-05
Os-191	Ci	<LLD	<LLD	<LLD	9.18E-06	9.18E-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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	1.84E-07	<LLD	<LLD	1.84E-07
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	1.95E-06	1.95E-06
Total	Ci	<LLD	1.51E-06	3.92E-07	3.91E-04	3.93E-04
Total > 8 days	Ci	<LLD	1.33E-06	3.92E-07	3.49E-04	3.51E-04
4. Tritium						
H-3	Ci	7.03E+01	1.35E+02	5.17E+02	9.83E+01	8.21E+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	1.37E-04	1.63E-04	4.84E-04	2.17E-04	1.00E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.75E-03	3.26E-03	9.68E-03	4.35E-03	1.00E-02
Beta Air Dose	mrad	5.09E-05	6.05E-05	1.79E-04	4.86E-04	7.77E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	5.09E-04	6.05E-04	1.79E-03	4.86E-03	3.88E-03
Maximum Organ Dose (excluding skin)	mrem	3.42E-02	5.33E-02	1.90E-01	4.01E-02	3.14E-01
Age		Child	Teen	Teen	Teen	Teen
Organ		Bone	Lung	Lung	Lung	Lung
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	4.56E-01	7.11E-01	2.54E+00	5.35E-01	2.09E+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 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	1.72E-05	1.32E-04	<LLD	1.22E-04	2.71E-04
Co-60	Ci	3.27E-07	3.08E-05	3.92E-07	1.35E-05	4.51E-05
Cr-51	Ci	3.03E-05	2.93E-04	<LLD	1.11E-04	4.34E-04
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	2.27E-06	<LLD	<LLD	2.27E-06
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	3.15E-06	<LLD	2.53E-06	5.69E-06
Mo-99	Ci	6.06E-07	1.81E-07	<LLD	<LLD	7.87E-07
Nb-95	Ci	<LLD	8.48E-06	<LLD	5.95E-06	1.44E-05
Os-191	Ci	<LLD	7.06E-06	<LLD	9.18E-06	1.62E-05
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	3.67E-07	<LLD	<LLD	3.67E-07
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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	1.03E-07	<LLD	<LLD	1.03E-07
Tc-99m	Ci	6.17E-07	1.84E-07	<LLD	<LLD	8.01E-07
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	6.03E-06	<LLD	1.95E-06	7.98E-06
Total	Ci	4.91E-05	4.84E-04	3.92E-07	2.66E-04	7.99E-04
4. Tritium						
H-3	Ci	5.01E+01	5.47E+01	5.58E+01	7.23E+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	2.09E-01	3.33E-01	3.56E-01	1.65E-01	1.06E+00
Kr-83m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	3.20E-08	<LLD	3.95E-08	<LLD	7.15E-08
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	6.21E-01	3.57E-02	3.52E-02	1.10E+00	1.79E+00
Xe-133m	Ci	4.53E-07	<LLD	3.41E-07	8.04E-05	8.12E-05
Xe-135	Ci	1.35E-04	5.03E-05	1.67E-06	2.64E-02	2.66E-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	8.31E-01	3.68E-01	3.92E-01	1.29E+00	2.88E+00
2. Iodines						
I-131	Ci	< LLD	9.92E-07	< LLD	< LLD	9.92E-07
I-132	Ci	< LLD	1.50E-05	< LLD	< LLD	1.50E-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	1.60E-05	< LLD	< LLD	1.60E-05

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	2.09E-01	3.33E-01	3.56E-01	1.65E-01	1.06E+00
Kr-83m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	3.20E-08	<LLD	3.95E-08	<LLD	7.15E-08
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	6.21E-01	3.57E-02	3.52E-02	1.10E+00	1.79E+00
Xe-133m	Ci	4.53E-07	<LLD	3.41E-07	8.04E-05	8.12E-05
Xe-135	Ci	1.35E-04	5.03E-05	1.67E-06	2.64E-02	2.66E-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	8.31E-01	3.68E-01	3.92E-01	1.29E+00	2.88E+00
2. Iodines						
I-131	Ci	5.35E-06	5.61E-05	< LLD	6.58E-06	6.80E-05
I-132	Ci	1.39E-04	4.29E-04	< LLD	< LLD	5.68E-04
I-133	Ci	6.29E-06	< LLD	< LLD	< LLD	6.29E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	1.51E-04	4.85E-04	< LLD	6.58E-06	6.42E-04

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	4.19E-06	<LLD	<LLD	4.15E-05	4.57E-05
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	1.72E-05	1.35E-04	<LLD	1.47E-04	2.99E-04
Co-60	Ci	1.69E-06	3.10E-05	3.92E-07	3.04E-05	6.35E-05
Cr-51	Ci	3.03E-05	2.99E-04	<LLD	1.43E-04	4.72E-04
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	2.27E-06	<LLD	<LLD	2.27E-06
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	3.23E-06	<LLD	2.53E-06	5.76E-06
Mo-99	Ci	6.06E-07	1.81E-07	<LLD	<LLD	7.87E-07
Nb-95	Ci	<LLD	9.02E-06	<LLD	1.56E-05	2.46E-05
Os-191	Ci	<LLD	7.06E-06	<LLD	9.18E-06	1.62E-05
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	3.67E-07	<LLD	<LLD	3.67E-07
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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	1.03E-07	<LLD	<LLD	1.03E-07
Tc-99m	Ci	6.17E-07	1.84E-07	<LLD	<LLD	8.01E-07
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	6.49E-06	<LLD	1.95E-06	8.44E-06
Total	Ci	5.47E-05	4.94E-04	3.92E-07	3.91E-04	9.40E-04
Total > 8 days	Ci	4.99E-05	4.94E-04	3.92E-07	3.49E-04	8.93E-04
4. Tritium						
H-3	Ci	4.77E+02	4.14E+02	7.13E+02	3.50E+02	1.95E+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	1.48E-04	<LLD	1.23E-04	2.71E-04
Co-60	Ci	3.07E-05	<LLD	1.43E-05	4.51E-05
Cr-51	Ci	3.23E-04	<LLD	1.11E-04	4.34E-04
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	2.27E-06	<LLD	<LLD	2.27E-06
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	3.15E-06	<LLD	2.53E-06	5.69E-06
Mo-99	Ci	6.06E-07	<LLD	1.81E-07	7.87E-07
Nb-95	Ci	8.48E-06	<LLD	5.95E-06	1.44E-05
Os-191	Ci	7.06E-06	<LLD	9.18E-06	1.62E-05
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
Ru-103	Ci	<LLD	<LLD	<LLD	<LLD
Ru-106	Ci	<LLD	<LLD	<LLD	<LLD
Sb-122	Ci	<LLD	<LLD	<LLD	<LLD
Sb-124	Ci	3.67E-07	<LLD	<LLD	3.67E-07
Sb-125	Ci	<LLD	<LLD	<LLD	<LLD
Se-75	Ci	<LLD	<LLD	<LLD	<LLD
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	1.03E-07	<LLD	<LLD	1.03E-07
Tc-99m	Ci	6.17E-07	<LLD	1.84E-07	8.01E-07
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	6.03E-06	<LLD	1.95E-06	7.98E-06
Total	Ci	5.31E-04	<LLD	2.68E-04	7.99E-04
4. Tritium					
H-3	Ci	7.30E+01	8.25E+01	7.74E+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	1.99E-01	5.31E-01	3.33E-01	1.06E+00
Kr-83m	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	3.20E-08	<LLD	3.95E-08	7.15E-08
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	6.09E-01	7.37E-02	1.11E+00	1.79E+00
Xe-133m	Ci	4.53E-07	<LLD	8.07E-05	8.12E-05
Xe-135	Ci	1.35E-04	<LLD	2.65E-02	2.66E-02
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-137	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138		<LLD	<LLD	<LLD	<LLD
Total	Ci	8.07E-01	6.05E-01	1.47E+00	2.88E+00
2. Iodines					
I-131	Ci	9.92E-07	<LLD	<LLD	9.92E-07
I-132	Ci	1.50E-05	<LLD	<LLD	1.50E-05
I-133	Ci	<LLD	<LLD	<LLD	<LLD
I-134	Ci	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	1.60E-05	<LLD	<LLD	1.60E-05

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	1.99E-01	5.31E-01	3.33E-01	1.06E+00
Kr-83m	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	3.20E-08	<LLD	3.95E-08	7.15E-08
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	6.09E-01	7.37E-02	1.11E+00	1.79E+00
Xe-133m	Ci	4.53E-07	<LLD	8.07E-05	8.12E-05
Xe-135	Ci	1.35E-04	<LLD	2.65E-02	2.66E-02
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-137	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	8.07E-01	6.05E-01	1.47E+00	2.88E+00
2. Iodines					
I-131	Ci	6.14E-05	< LLD	6.58E-06	6.80E-05
I-132	Ci	5.68E-04	< LLD	< LLD	5.68E-04
I-133	Ci	6.29E-06	< LLD	< LLD	6.29E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.36E-04	< LLD	6.58E-06	6.42E-04

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	4.19E-06	<LLD	4.15E-05	4.57E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	1.52E-04	<LLD	1.48E-04	2.99E-04
Co-60	Ci	3.23E-05	<LLD	3.12E-05	6.35E-05
Cr-51	Ci	3.29E-04	<LLD	1.43E-04	4.72E-04
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	2.27E-06	<LLD	<LLD	2.27E-06
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	3.23E-06	<LLD	2.53E-06	5.76E-06
Mo-99	Ci	6.06E-07	<LLD	1.81E-07	7.87E-07
Nb-95	Ci	9.02E-06	<LLD	1.56E-05	2.46E-05
Os-191	Ci	7.06E-06	<LLD	9.18E-06	1.62E-05
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
Ru-103	Ci	<LLD	<LLD	<LLD	<LLD
Ru-106	Ci	<LLD	<LLD	<LLD	<LLD
Sb-122	Ci	<LLD	<LLD	<LLD	<LLD
Sb-124	Ci	3.67E-07	<LLD	<LLD	3.67E-07
Sb-125	Ci	<LLD	<LLD	<LLD	<LLD
Se-75	Ci	<LLD	<LLD	<LLD	<LLD
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	1.03E-07	<LLD	<LLD	1.03E-07
Tc-99m	Ci	6.17E-07	<LLD	1.84E-07	8.01E-07
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	6.49E-06	<LLD	1.95E-06	8.44E-06
Total	Ci	5.47E-04	<LLD	3.93E-04	9.40E-04
Total > 8 days	Ci	5.42E-04	<LLD	3.51E-04	8.93E-04
4. Tritium					
H-3	Ci	7.67E+02	2.08E+02	8.21E+02	1.80E+03

Table 43:
Doses To Special Locations For 2013

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NA

ENERGY INFORMATION CENTER (EIC) was relocated to an offsite location in 2011

Table 44:
Integrated Population Dose for 2013

January to March

JAN - MAR

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	3.31E-04 .01%	3.31E-04 .01%	3.31E-04 94.01%	3.31E-04 .01%	3.31E-04 .01%	3.31E-04 .01%	3.31E-04 .01%	9.74E-04 .02%
GROUND	1.85E-05 .00%	1.85E-05 .00%	1.85E-05 5.25%	1.85E-05 .00%	1.85E-05 .00%	1.85E-05 .00%	1.85E-05 .00%	2.17E-05 .00%
INHAL	1.66E+00 26.90%	1.66E+00 26.90%	8.99E-07 .26%	1.66E+00 26.90%	1.66E+00 26.90%	1.66E+00 26.90%	1.66E+00 26.90%	1.66E+00 26.89%
VEGET	3.86E+00 62.76%	3.86E+00 62.76%	1.61E-06 .46%	3.86E+00 62.76%	3.86E+00 62.76%	3.86E+00 62.76%	3.86E+00 62.76%	3.86E+00 62.75%
COW MILK	4.50E-01 7.30%	4.50E-01 7.30%	6.68E-08 .02%	4.50E-01 7.30%	4.50E-01 7.30%	4.50E-01 7.30%	4.50E-01 7.30%	4.50E-01 7.30%
MEAT	1.87E-01 3.04%	1.87E-01 3.04%	3.13E-09 .00%	1.87E-01 3.04%	1.87E-01 3.04%	1.87E-01 3.04%	1.87E-01 3.04%	1.87E-01 3.04%
TOTAL	6.16E+00	6.16E+00	3.52E-04	6.16E+00	6.16E+00	6.16E+00	6.16E+00	6.16E+00
(1) PER CAPITA DOSE (REM)	3.14E-06	3.14E-06	1.80E-10	3.14E-06	3.14E-06	3.14E-06	3.14E-06	3.14E-06

April through June

APR - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.60E-04 .01%	1.60E-04 .01%	1.60E-04 23.89%	1.60E-04 .01%	1.60E-04 .01%	1.60E-04 .01%	1.60E-04 .01%	3.04E-04 .01%
GROUND	4.58E-04 .02%	4.58E-04 .02%	4.58E-04 68.27%	4.58E-04 .02%	4.58E-04 .02%	4.58E-04 .02%	4.58E-04 .02%	5.38E-04 .02%
INHAL	1.09E+00 37.03%	1.09E+00 37.02%	1.62E-05 2.42%	1.09E+00 37.03%	1.09E+00 37.03%	1.09E+00 37.03%	1.09E+00 37.03%	1.09E+00 37.02%
VEGET	1.52E+00 51.63%	1.52E+00 51.63%	3.50E-05 5.22%	1.52E+00 51.63%	1.52E+00 51.63%	1.52E+00 51.62%	1.52E+00 51.62%	1.52E+00 51.62%
COW MILK	2.72E-01 9.24%	2.72E-01 9.24%	1.22E-06 .18%	2.72E-01 9.24%	2.72E-01 9.24%	2.72E-01 9.24%	2.72E-01 9.24%	2.72E-01 9.24%
MEAT	6.15E-02 2.09%	6.15E-02 2.09%	7.02E-08 .01%	6.15E-02 2.09%	6.15E-02 2.09%	6.15E-02 2.09%	6.15E-02 2.09%	6.15E-02 2.09%
TOTAL	2.95E+00	2.95E+00	6.70E-04	2.95E+00	2.95E+00	2.95E+00	2.95E+00	2.95E+00
(1) PER CAPITA DOSE (REM)	1.51E-06	1.51E-06	3.42E-10	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06

Table 44: (continued)
Integrated Population Dose for 2013

January through June

JAN - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	4.91E-04 .01%	4.91E-04 .01%	4.91E-04 48.04%	4.91E-04 .01%	4.91E-04 .01%	4.91E-04 .01%	4.91E-04 .01%	1.28E-03 .01%
GROUND	4.76E-04 .01%	4.76E-04 .01%	4.76E-04 46.57%	4.76E-04 .01%	4.76E-04 .01%	4.76E-04 .01%	4.76E-04 .01%	5.60E-04 .01%
INHAL	2.75E+00 30.17%	2.75E+00 30.17%	1.71E-05 1.68%	2.75E+00 30.17%	2.75E+00 30.17%	2.75E+00 30.18%	2.75E+00 30.18%	2.75E+00 30.17%
VEGET	5.38E+00 59.16%	5.38E+00 59.16%	3.66E-05 3.58%	5.38E+00 59.16%	5.38E+00 59.16%	5.39E+00 59.15%	5.38E+00 59.15%	5.38E+00 59.15%
COW MILK	7.22E-01 7.93%	7.22E-01 7.93%	1.29E-06 .13%	7.22E-01 7.93%	7.22E-01 7.93%	7.22E-01 7.93%	7.22E-01 7.93%	7.22E-01 7.93%
MEAT	2.49E-01 2.73%	2.49E-01 2.73%	7.33E-08 .01%	2.49E-01 2.73%	2.49E-01 2.73%	2.49E-01 2.73%	2.49E-01 2.73%	2.49E-01 2.73%
TOTAL	9.10E+00	9.10E+00	1.02E-03	9.10E+00	9.10E+00	9.10E+00	9.10E+00	9.10E+00
(1) PER CAPITA DOSE (REM)	4.65E-06	4.65E-06	5.21E-10	4.65E-06	4.65E-06	4.65E-06	4.65E-06	4.65E-06

July through September

JUL - SEP

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.22E-04 .00%	1.22E-04 .00%	1.22E-04 96.08%	1.22E-04 .00%	1.22E-04 .00%	1.22E-04 .00%	1.22E-04 .00%	2.30E-04 .01%
GROUND	4.98E-06 .00%	4.98E-06 .00%	4.98E-06 3.92%	4.98E-06 .00%	4.98E-06 .00%	4.98E-06 .00%	4.98E-06 .00%	5.86E-06 .00%
INHAL	1.52E+00 33.06%	1.52E+00 33.06%	0.00E+00 .00%	1.52E+00 33.06%	1.52E+00 33.06%	1.52E+00 33.06%	1.52E+00 33.06%	1.52E+00 33.06%
VEGET	2.55E+00 55.47%	2.55E+00 55.47%	0.00E+00 .00%	2.55E+00 55.47%	2.55E+00 55.47%	2.55E+00 55.47%	2.55E+00 55.47%	2.55E+00 55.47%
COW MILK	4.16E-01 9.06%	4.16E-01 9.06%	0.00E+00 .00%	4.16E-01 9.06%	4.16E-01 9.06%	4.16E-01 9.06%	4.16E-01 9.06%	4.16E-01 9.06%
MEAT	1.10E-01 2.40%	1.10E-01 2.40%	0.00E+00 .00%	1.10E-01 2.40%	1.10E-01 2.40%	1.10E-01 2.40%	1.10E-01 2.40%	1.10E-01 2.40%
TOTAL	4.59E+00	4.59E+00	1.27E-04	4.59E+00	4.59E+00	4.59E+00	4.59E+00	4.59E+00
(1) PER CAPITA DOSE (REM)	2.34E-06	2.34E-06	6.48E-11	2.34E-06	2.34E-06	2.34E-06	2.34E-06	2.34E-06

Table 44: (continued)
Integrated Population Dose for 2013

October through December

OCT - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	7.42E-04 .02%	7.42E-04 .02%	7.42E-04 62.08%	7.42E-04 .02%	7.42E-04 .02%	7.42E-04 .02%	7.42E-04 .02%	2.39E-03 .06%
GROUND	2.91E-04 .01%	2.91E-04 .01%	2.91E-04 24.40%	2.91E-04 .01%	2.91E-04 .01%	2.91E-04 .01%	2.91E-04 .01%	3.43E-04 .01%
INHAL	1.25E+00 28.82%	1.25E+00 28.82%	5.79E-05 4.85%	1.25E+00 28.82%	1.25E+00 28.82%	1.25E+00 28.82%	1.25E+00 28.83%	1.25E+00 28.81%
VEGET	2.62E+00 60.44%	2.62E+00 60.44%	1.02E-04 8.54%	2.62E+00 60.44%	2.62E+00 60.44%	2.62E+00 60.44%	2.62E+00 60.43%	2.62E+00 60.42%
COW MILK	3.43E-01 7.91%	3.43E-01 7.91%	1.39E-06 .12%	3.43E-01 7.91%	3.43E-01 7.91%	3.43E-01 7.91%	3.43E-01 7.91%	3.43E-01 7.91%
MEAT	1.21E-01 2.80%	1.21E-01 2.80%	2.37E-07 .02%	1.21E-01 2.80%	1.21E-01 2.80%	1.21E-01 2.80%	1.21E-01 2.80%	1.21E-01 2.80%
TOTAL	4.33E+00	4.33E+00	1.19E-03	4.33E+00	4.33E+00	4.33E+00	4.33E+00	4.33E+00
(1) PER CAPITA DOSE (REM)	2.21E-06	2.21E-06	6.07E-10	2.21E-06	2.21E-06	2.21E-06	2.21E-06	2.21E-06

July through December

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 65.35%	8.64E-04 .01%	8.64E-04 .01%	8.64E-04 .01%	8.64E-04 .01%	2.62E-03 .03%
GROUND	2.96E-04 .00%	2.96E-04 .00%	2.96E-04 22.43%	2.96E-04 .00%	2.96E-04 .00%	2.96E-04 .00%	2.96E-04 .00%	3.49E-04 .00%
INHAL	2.77E+00 31.00%	2.77E+00 31.00%	5.79E-05 4.38%	2.77E+00 31.00%	2.77E+00 31.00%	2.77E+00 31.00%	2.77E+00 31.01%	2.77E+00 30.99%
VEGET	5.16E+00 57.89%	5.16E+00 57.89%	1.02E-04 7.72%	5.16E+00 57.89%	5.16E+00 57.89%	5.16E+00 57.89%	5.16E+00 57.88%	5.16E+00 57.88%
COW MILK	7.59E-01 8.51%	7.59E-01 8.51%	1.39E-06 .10%	7.59E-01 8.51%	7.59E-01 8.51%	7.59E-01 8.51%	7.59E-01 8.50%	7.59E-01 8.50%
MEAT	2.31E-01 2.59%	2.31E-01 2.59%	2.37E-07 .02%	2.31E-01 2.59%	2.31E-01 2.59%	2.31E-01 2.59%	2.31E-01 2.59%	2.31E-01 2.59%
TOTAL	8.92E+00	8.92E+00	1.32E-03	8.92E+00	8.92E+00	8.92E+00	8.92E+00	8.92E+00
(1) PER CAPITA DOSE (REM)	4.55E-06	4.55E-06	6.74E-10	4.55E-06	4.55E-06	4.55E-06	4.55E-06	4.55E-06

Table 44: (continued)
Integrated Population Dose for 2013

January through December

JAN - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.35E-03 .01%	1.35E-03 .01%	1.35E-03 57.80%	1.35E-03 .01%	1.35E-03 .01%	1.35E-03 .01%	1.35E-03 .01%	3.90E-03 .02%
GROUND	7.73E-04 .00%	7.73E-04 .00%	7.73E-04 32.96%	7.73E-04 .00%	7.73E-04 .00%	7.73E-04 .00%	7.73E-04 .00%	9.09E-04 .01%
INHAL	5.51E+00 30.58%	5.51E+00 30.58%	7.51E-05 3.20%	5.51E+00 30.58%	5.51E+00 30.58%	5.51E+00 30.59%	5.51E+00 30.59%	5.51E+00 30.58%
VEGET	1.05E+01 58.53%	1.05E+01 58.53%	1.39E-04 5.91%	1.05E+01 58.53%	1.05E+01 58.53%	1.05E+01 58.52%	1.05E+01 58.52%	1.05E+01 58.52%
COW MILK	1.48E+00 8.21%	1.48E+00 8.21%	2.68E-06 .11%	1.48E+00 8.21%	1.48E+00 8.21%	1.48E+00 8.21%	1.48E+00 8.21%	1.48E+00 8.21%
MEAT	4.80E-01 2.66%	4.80E-01 2.66%	3.10E-07 .01%	4.80E-01 2.66%	4.80E-01 2.66%	4.80E-01 2.66%	4.80E-01 2.66%	4.80E-01 2.66%
TOTAL	1.80E+01	1.80E+01	2.34E-03	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01
(1) PER CAPITA DOSE (REM)	9.19E-06	9.19E-06	1.19E-09	9.19E-06	9.19E-06	9.19E-06	9.19E-06	9.19E-06

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

Table 45:
Summary of Individual Doses for 2013
Radiation Doses At And Beyond The Site Boundary

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	4.64E-04	2.67E-04	2.92E-04	5.12E-04	1.40E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	9.28E-03	5.34E-03	5.84E-03	1.02E-02	1.40E-02
Beta Air Dose	mrad	3.14E-04	9.73E-05	1.06E-04	5.14E-04	9.83E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	3.14E-03	9.73E-04	1.06E-03	5.14E-03	4.91E-03
Maximum Individual						
Total Body	mrem	3.03E-04	1.77E-04	1.94E-04	3.31E-04	9.17E-04
Skin	mrem	5.28E-04	2.85E-04	3.11E-04	6.27E-04	1.61E-03
Location						
Unit 1	miles	1.70 SSE	1.40 SSW	1.27 SE	1.70 SSE	1.70 SSE
Unit 2	miles	1.88 SSE	1.14 SSW	1.31 SE	1.88 SSE	1.88 SSE
Unit 3	miles	1.73 SSE	1.00 SSW	1.40 SE	1.73 SSE	1.73 SSE
Maximum Organ Dose(1) From All Radionuclides						
	Age	Child	Child	Child	Child	Child
	Organ	Bone	Bone	Bone	Bone	Bone
	mrem	8.55E-01	1.24E+00	7.18E-01	8.06E-01	3.62E+00
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	1.14E+01	1.65E+01	9.57E+00	1.07E+01	2.41E+01
Location						
Unit 1	miles	2.43 ENE	2.43 ENE	2.43 ENE	2.43 ENE	2.43 ENE
Unit 2	miles	2.63 ENE	2.63 ENE	2.63 ENE	2.63 ENE	2.63 ENE
Unit 3	miles	2.80 ENE	2.80 ENE	2.80 ENE	2.80 ENE	2.80 ENE
Maximum Organ Dose(1) From All Radionuclides Excluding C-14						
	Age	Teen	Child	Child	Teen	Teen
	Organ	Thyroid	Thyroid	Thyroid	Lung	Thyroid
	mrem	1.22E-01	8.53E-02	8.54E-02	4.91E-02	2.87E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	1.63E-02	1.14E-02	1.14E-02	6.55E-03	1.91E-02
Unit 1	miles	2.74 S	2.43 ENE	2.43 ENE	2.74 S	2.74 S
Unit 2	miles	2.56 S	2.63 ENE	2.63 ENE	2.56 S	2.56 S
Unit 3	miles	2.35 S	2.80 ENE	2.80 ENE	2.35 S	2.35 S
Organ Dose from tritium only for Unit 2 location above	mrem	1.21E-01	8.50E-02	8.53E-02	2.60E-01	4.97E-01
Fraction of organ dose from tritum only for Unit 2 location above	%	86.96	95.77	100.00	98.69	98.40
X/Q for Unit 2 location above	sec/m^3	6.62E-06	1.13E-06	6.53E-07	9.37E-06	5.27E-06
D/Q for Unit 2 location above	m-2	2.33E-09	1.90E-09	1.64E-09	2.68E-09	1.78E-09

(1) Excluding skin

(2) 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

2014 ARERR Errata

The following permits had the Sr-89 activity removed from the report because the reported activity was based on laboratory results that were below the reported sample MDA: 20141122, 20141128, 20141131, 20141137, 20141145, 20141148, 20141154, 20141156, 20141159, 20141161, 20141165, 20141169, 20142090, 20142094, 20142096, 20142098, 20142100, 20142102, 20142105, 20142107, 20142109, 20142114, 20142116, 20142120, 20142123, 20143075, 20143077, 20143079, 20143081, 20143085, 20143088, 20143090, 20143094, 20143098, 20143101, 20143103, 20143105 and 20143107.

The following permits had the Sr-90 activity removed from the report because the reported activity was based on laboratory results that were below the reported sample MDA: 20141001, 20141004, 20141006, 20141010, 20141012, 20141015, 20141017, 20141019, 20141021, 20141024, 20141026, 20141029, 20141032, 20141033, 20141036, 20141039, 20141041, 20141045, 20141047, 20141050, 20141052, 20141054, 20141057, 20141059, 20141063, 20141066, 20141068, 20141069, 20141072, 20141073, 20141074, 20141075, 20141078, 20141079, 20141081, 20141082, 20141084, 20141086, 20141089, 20141091, 20141092, 20141093, 20141094, 20141095, 20141096, 20141098, 20141099, 20141101, 20141102, 20141103, 20141108, 20141110, 20141114, 20141115, 20141118, 20141123, 20141129, 20141132, 20141139, 20141147, 20141151, 20141155, 20141157, 20141160, 20141162, 20141166, 20142003, 20142005, 20142008, 20142012, 20142015, 20142018, 20142022, 20142024, 20142028, 20142032, 20142035, 20142039, 20142044, 20142047, 20142050, 20142053, 20142059, 20142063, 20142067, 20142070, 20142073, 20142078, 20142080, 20142083, 20142087, 20142089, 20142090, 20142091, 20142094, 20142095, 20142096, 20142097, 20142098, 20142099, 20142100, 20142101, 20142102, 20142104, 20142105, 20142106, 20142107, 20142108, 20142109, 20142113, 20142114, 20142115, 20142116, 20142118, 20142120, 20142121, 20142123, 20142124, 20142126, 20142129, 20142131, 20142133, 20142136, 20142140, 20142142, 20142144, 20142149, 20142151, 20142154, 20142157, 20142159, 20143073, 20143075, 20143076, 20143077, 20143078, 20143079, 20143080, 20143081, 20143084, 20143085, 20143087, 20143088, 20143089, 20143090, 20143092, 20143094, 20143096, 20143098, 20143099, 20143101, 20143102, 20143103, 20143104, 20143105, 20143106, 20143107, 20143108, 20143110, 20143111, 20143112, 20143113, 20143114, 20143116, 20143117, 20143119, 20143121, 20143123, 20143124, 20143126, 20143127, 20143128, 20143129, 20143131, 20143132, 20143134, 20143136, 20143137, 20143138, 20143139, 20143140, 20143141, 20143142 and 20143143.

The activity from batch permits 20151003, 20152005 and 20153006 was moved from 2015 to 2014 based on the permit start dates being either December 13, 2014 or December 20, 2014.

The following permits had the tritium activity removed from the report because the reported tritium activity was the result of interference from a BAC release, which is accounted for on the boric acid concentrator batch permit: 20141139, 20141147, 20141151, 20141155, 20142023, 20142026, 20142030, 20142033, 20142068, 20142071, and 20142074.

The following permits had the tritium removed from the report because the reported activity was the result of refueling activities and the tritium activity was already accounted for on Refueling Purge batch permits: 20141123, 20141129, 20141132, 20142051, 20142054, 20142060 and 20142064.

The Ar-41 activity on permit 20142046 was adjusted in the report to account for decay and one CTMT volume.

The Xe-131m activity (7.05 Ci) reported on permit 20141093 was removed from the report because the backup sample did not detect Xe-131m.

Permits having a release duration greater than 216 hours were accounted for as continuous release.

Table 1: Evaporation Pond Data was revised to correct an error when calculating the Average Tritium Concentration.

Site Boundary inhalation doses were calculated with unit specific X/Q and the entire estimated C-14 released.

The following pages contain the corrections to the 2014 ARERR.

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 261 acres which is divided into three segments: Pond 1A (131 acres), Pond 1B (77.5 acres) and Pond 1C (52.5 acres). This equates to 3.22E+11 cc evaporated from Pond One for each of the first and fourth quarters and 8.85E+11 cc evaporated for each of the second and third quarters. Evaporation Pond Two is approximately 232 acres which is divided into three segments: Pond 2A (117 acres), Pond 2B (87 acres) and Pond 2C (30 acres). The amount evaporated from Pond Two is 2.86E+11 cc for each of the first and fourth quarters and 7.87E+11 cc for each of the second and third quarters.

Evaporation Pond Three is constructed of two smaller ponds of 90 acres each (3A and 3B). The amount evaporated from each section of Pond Three is 1.11E+11 cc for each of the first and fourth quarters and 3.05E+11 cc for each of the second and third quarters.

Using a site boundary X/Q of 5.0E-05 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 method used for the setpoint values are more reliable than basing the setpoints upon the constantly varying values of 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.

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.

The PVNGS calculated production of carbon-14 is 18.5 curies per operating cucle (500 days) or 15.5 curies per year. The 13.5 curies per year will be divided equally between each quarter (3.38 curies per reactor). The estimated carbon-14 activity is included in all of the inhalation and ingestion dose calculations unless specifically noted.

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 Dose Summary

Dose for 2014 was primarily due to the release of tritium. Tritium production is estimated to be 1000 curies per Reactor Unit per year. In order to control plant tritium concentrations, tritium releases should match tritium production. For 2014, PVNGS released a total of 2191 curies of tritium (see Table 39).

Table 1: Evaporation Pond Data					
Evaporation Pond 1(1A, 1B, 1C)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	3.22E+11	8.85E+11	8.85E+11	3.22E+11	
Tritium Concentration (uCi/cc)	1.87E-06	1.33E-06	1.36E-06	1.01E-06	
Tritium Curies	6.01E-01	1.18E+00	1.21E+00	3.26E-01	3.31E+00
Evaporation Pond 2 (2A and 2B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.89E+11	7.94E+11	7.94E+11	2.89E+11	
Tritium Concentration (uCi/cc)	7.20E-07	6.80E-07	8.40E-07	5.62E-07	
Tritium curies	2.08E-01	5.40E-01	6.67E-01	1.62E-01	1.58E+00
Evaporation Pond 3 (3A and 3B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.20E+11	6.04E+11	6.04E+11	2.20E+11	
3B Tritium Concentration (uCi/cc)	8.25E-07	5.39E-07	6.18E-07	4.38E-07	
3B Tritium curies	1.81E-01	3.25E-01	3.73E-01	9.62E-02	9.76E-01
Dose (mRem)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Pond 1	8.33E-03	1.63E-02	1.67E-02	4.52E-03	4.59E-02
Pond 2	2.88E-03	7.48E-03	9.25E-03	2.25E-03	2.19E-02
Pond 3	2.51E-03	4.51E-03	5.18E-03	1.33E-03	1.35E-02
Total	1.37E-02	2.83E-02	3.12E-02	8.10E-03	8.13E-02

Table 2: Batch Release Data			
All times are in hours	Unit 1	Unit 2	Unit 3
January - June			
Number of batch releases	16	37	21
Total time period for batch releases	136.31	1884.81	393.92
Maximum time period for a batch release	118.75	168.00	168.00
Average time period for a batch release	8.52	50.94	18.76
Minimum time period for a batch release	0.45	0.10	0.63
July - December			
Number of batch releases	49	18	18
Total time period for batch releases	2417.35	92.07	252.75
Maximum time period for a batch release	713.23	67.50	125.98
Average time period for a batch release	49.33	5.11	14.04
Minimum time period for a batch release	0.04	0.40	0.28
January - December			
Number of batch releases	65	55	39
Total time period for batch releases	2553.66	1976.88	646.67
Maximum time period for a batch release	713.23	168.00	168.00
Average time period for a batch release	39.29	35.94	16.58
Minimum time period for a batch release	0.04	0.10	0.28

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	4.40E-02	4.49E-02	3.46E-01	4.33E-01	8.68E-01	3.54E+01
2. Average release rate for period	µCi/sec	5.66E-03	5.71E-03	4.35E-02	5.45E-02	2.75E-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	< LLD	< LLD	< LLD	2.34E-05	2.34E-05	3.32E+01
2. Average release rate for period	µCi/sec	< LLD	< LLD	< LLD	2.94E-06	7.42E-07	
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	1.29E-06	<LLD	3.40E-07	4.28E-04	4.30E-04	3.43E+01
2. Average release rate for period	µCi/sec	5.53E-05	4.36E+00	<LLD	1.26E-01	1.36E-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	1.51E+01	1.94E+02	3.80E+02	3.37E+02	9.26E+02	3.85E+01
2. Average release rate for period	µCi/sec	1.95E+00	2.47E+01	4.78E+01	4.24E+01	2.94E+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	< 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	<LLD	<LLD	<LLD	<LLD
2. Iodines						
I-131	Ci	< LLD	< LLD	< LLD	1.46E-05	1.46E-05
I-132	Ci	< LLD	< LLD	< LLD	2.10E-04	2.10E-04
I-133	Ci	< LLD	< LLD	< LLD	4.05E-06	4.05E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	2.28E-04	2.28E-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	1.29E-06	<LLD	<LLD	4.87E-05	5.00E-05
Co-60	Ci	<LLD	<LLD	3.40E-07	1.19E-05	1.22E-05
Cr-51	Ci	<LLD	<LLD	<LLD	1.80E-04	1.80E-04
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	4.29E-06	4.29E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	8.21E-06	8.21E-06
Os-191	Ci	<LLD	<LLD	<LLD	1.71E-05	1.71E-05
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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	<LLD	3.13E-07	3.13E-07
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	4.11E-06	4.11E-06
Total	Ci	1.29E-06	<LLD	3.40E-07	2.75E-04	2.77E-04
4.Tritium						
H-3	Ci	1.51E+01	1.04E+01	1.79E+01	2.04E+01	6.39E+01

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	4.40E-02	4.49E-02	3.46E-01	1.45E-01	5.80E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	7.22E-08	< LLD	7.22E-08
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	2.46E-03	2.46E-03
Xe-133	Ci	<LLD	<LLD	7.20E-05	2.52E-01	2.53E-01
Xe-133m	Ci	<LLD	<LLD	1.48E-06	2.89E-02	2.89E-02
Xe-135	Ci	<LLD	<LLD	4.71E-06	3.85E-03	3.85E-03
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	4.40E-02	4.49E-02	3.46E-01	4.33E-01	8.68E-01
2. Iodines						
I-131	Ci	< LLD	< LLD	< LLD	2.34E-05	2.34E-05
I-132	Ci	< LLD	< LLD	< LLD	8.04E-04	8.04E-04
I-133	Ci	< LLD	< LLD	< LLD	4.05E-06	4.05E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	8.32E-04	8.32E-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	1.06E-05	1.06E-05
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	1.29E-06	< LLD	< LLD	6.83E-05	6.96E-05
Co-60	Ci	< LLD	< LLD	3.40E-07	2.14E-05	2.17E-05
Cr-51	Ci	< LLD	< LLD	< LLD	2.65E-04	2.65E-04
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	9.69E-07	9.69E-07
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	5.40E-06	5.40E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	2.84E-05	2.84E-05
Os-191	Ci	< LLD	< LLD	< LLD	1.71E-05	1.71E-05
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	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	3.13E-07	3.13E-07
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	2.16E-05	2.16E-05
Total	Ci	1.29E-06	<LLD	3.40E-07	4.39E-04	4.40E-04
Total > 8 days	Ci	1.29E-06	<LLD	3.40E-07	4.28E-04	4.30E-04
4.Tritium						
H-3	Ci	1.51E+01	1.94E+02	3.80E+02	3.37E+02	9.26E+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	9.69E-05	9.89E-05	7.62E-04	3.45E-04	1.30E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	1.94E-03	1.98E-03	1.52E-02	6.90E-03	1.30E-02
Beta Air Dose	mrad	3.42E-05	3.49E-05	2.69E-04	2.10E-04	5.48E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	3.42E-04	3.49E-04	2.69E-03	2.10E-03	2.74E-03
Maximum Organ Dose (excluding skin)	mrem	2.87E-02	6.24E-02	1.18E-01	1.06E-01	2.95E-01
Age		Child	Teen	Teen	Teen	Teen
Organ		Bone	T. Body	Lung	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	%	3.83E-01	8.33E-01	1.58E+00	1.41E+00	1.97E+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	6.55E-02	1.04E+00	4.84E-02	7.12E-02	1.22E+00	3.54E+01
2. Average release rate for period	µCi/sec	8.42E-03	1.32E-01	6.08E-03	8.96E-03	3.87E-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	< LLD	2.14E-05	< LLD	< LLD	2.14E-05	3.32E+01
2. Average release rate for period	µCi/sec	< LLD	2.72E-06	< LLD	< LLD	6.79E-07	
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	<LLD	1.63E-04	<LLD	<LLD	1.63E-04	3.43E+01
2. Average release rate for period	µCi/sec	<LLD	2.07E-05	<LLD	<LLD	5.17E-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	6.00E+02	2.72E+02	2.50E+01	2.07E+01	9.18E+02	3.85E+01
2. Average release rate for period	µCi/sec	7.72E+01	3.47E+01	3.15E+00	2.60E+00	2.91E+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 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	< LLD	6.26E-05	< LLD	< LLD	6.26E-05
Co-60	Ci	< LLD	1.37E-05	< LLD	< LLD	1.37E-05
Cr-51	Ci	< LLD	6.81E-05	< LLD	< LLD	6.81E-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	1.85E-06	< LLD	< LLD	1.85E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	1.69E-06	< LLD	< LLD	1.69E-06
Os-191	Ci	< LLD	8.24E-06	< LLD	< LLD	8.24E-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	<LLD	4.53E-07	<LLD	<LLD	4.53E-07
Sr-90	Ci	<LLD	4.39E-08	<LLD	<LLD	4.39E-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	<LLD	1.57E-04	<LLD	<LLD	1.57E-04
4. Tritium						
H-3	Ci	1.91E+01	2.36E+01	2.50E+01	2.06E+01	8.83E+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	5.88E-02	1.69E-01	4.28E-02	3.91E-02	3.09E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	4.33E-03	< LLD	< LLD	4.33E-03
Kr-85m	Ci	1.81E-08	< LLD	< LLD	1.05E-04	1.05E-04
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	6.73E-03	8.18E-01	5.56E-03	3.20E-02	8.62E-01
Xe-133m	Ci	7.81E-08	< LLD	< LLD	< LLD	7.81E-08
Xe-135	Ci	5.34E-07	4.47E-02	4.25E-05	1.76E-05	4.47E-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	6.55E-02	1.04E+00	4.84E-02	7.12E-02	1.22E+00
2. Iodines						
I-131	Ci	< LLD	9.91E-08	< LLD	< LLD	9.91E-08
I-132	Ci	< LLD	4.00E-06	< LLD	< LLD	4.00E-06
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	4.10E-06	< LLD	< LLD	4.10E-06

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	5.88E-02	1.69E-01	4.28E-02	3.91E-02	3.09E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	4.33E-03	< LLD	< LLD	4.33E-03
Kr-85m	Ci	1.81E-08	< LLD	< LLD	1.05E-04	1.05E-04
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	6.73E-03	8.18E-01	5.56E-03	3.20E-02	8.62E-01
Xe-133m	Ci	7.81E-08	< LLD	< LLD	< LLD	7.81E-08
Xe-135	Ci	5.34E-07	4.47E-02	4.25E-05	1.76E-05	4.47E-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	6.55E-02	1.04E+00	4.84E-02	7.12E-02	1.22E+00
2. Iodines						
I-131	Ci	< LLD	2.14E-05	< LLD	< LLD	2.14E-05
I-132	Ci	< LLD	4.40E-04	< LLD	< LLD	4.40E-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	< LLD	4.61E-04	< LLD	< LLD	4.61E-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	6.90E-05	< LLD	1.01E-05	7.91E-05
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	6.38E-05	< LLD	< LLD	6.38E-05
Co-60	Ci	< LLD	1.47E-05	< LLD	< LLD	1.47E-05
Cr-51	Ci	< LLD	7.00E-05	< LLD	< LLD	7.00E-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	2.00E-06	< LLD	< LLD	2.00E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	2.95E-06	< LLD	< LLD	2.95E-06
Os-191	Ci	< LLD	8.24E-06	< LLD	< LLD	8.24E-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	<LLD	4.53E-07	<LLD	<LLD	4.53E-07
Sr-90	Ci	<LLD	4.39E-08	<LLD	<LLD	4.39E-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	7.46E-07	< LLD	< LLD	7.46E-07
Total	Ci	<LLD	2.32E-04	<LLD	1.01E-05	2.42E-04
Total > 8 days	Ci	<LLD	1.63E-04	<LLD	<LLD	1.63E-04
4. Tritium						
H-3	Ci	6.00E+02	2.72E+02	2.50E+01	2.07E+01	9.18E+02

Table 19: Unit 2 Radiation Doses At And Beyond The Site Boundary						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Unit 2		Q1	Q2	Q3	Q4	year
Gamma Air Dose	mrad	1.37E-04	4.99E-04	1.00E-04	9.37E-05	8.30E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.75E-03	9.98E-03	2.00E-03	1.87E-03	8.30E-03
Beta Air Dose	mrad	5.08E-05	4.52E-04	3.72E-05	4.40E-05	5.84E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	5.08E-04	4.52E-03	3.72E-04	4.40E-04	2.92E-03
Maximum Organ Dose (excluding skin)	mrem	1.95E-01	9.10E-02	3.03E-02	3.03E-02	3.09E-01
Age		Teen	Teen	Child	Child	Teen
Organ		T. Body	Thyroid	Bone	Bone	Thyroid
ODCM Req. 4.2 Limit	%	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	2.60E+00	1.21E+00	4.05E-01	4.05E-01	2.06E+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	4.31E-02	4.56E-02	4.36E-02	4.58E-02	1.78E-01	3.54E+01
2. Average release rate for period	µCi/sec	5.54E-03	5.80E-03	5.49E-03	5.76E-03	5.64E-03	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
B. Iodine 131							
1. Total Iodine 131	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	3.32E+01
2. Average release rate for period	µCi/sec	< LLD	< LLD	< LLD	< LLD	< LLD	
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	7.36E-06	4.31E-07	2.40E-06	1.04E-06	1.12E-05	3.43E+01
2. Average release rate for period	µCi/sec	9.47E-07	5.48E-08	3.02E-07	1.31E-07	3.56E-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	1.24E+02	2.59E+01	1.80E+02	1.73E+01	3.47E+02	3.85E+01
2. Average release rate for period	µCi/sec	1.59E+01	3.29E+00	2.26E+01	2.18E+00	1.10E+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 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	5.01E-06	3.59E-07	2.40E-06	< LLD	7.77E-06
Co-60	Ci	9.84E-07	< LLD	< LLD	< LLD	9.84E-07
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	1.18E-06	< LLD	< LLD	< LLD	1.18E-06
Os-191	Ci	< LLD	< LLD	< LLD	1.04E-06	1.04E-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	<LLD	<LLD	<LLD	<LLD	<LLD
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	< LLD	< LLD	< LLD	< LLD
Total	Ci	7.17E-06	3.59E-07	2.40E-06	1.04E-06	1.10E-05
4. Tritium						
H-3	Ci	3.01E+01	2.59E+01	2.28E+01	1.73E+01	9.60E+01

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	5.01E-06	3.59E-07	2.40E-06	< LLD	7.77E-06
Co-60	Ci	9.84E-07	< LLD	< LLD	< LLD	9.84E-07
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	1.37E-06	7.21E-08	< LLD	< LLD	1.44E-06
Os-191	Ci	< LLD	< LLD	< LLD	1.04E-06	1.04E-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	<LLD	<LLD	<LLD	<LLD	<LLD
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	< LLD	< LLD	< LLD	< LLD
Total	Ci	7.36E-06	4.31E-07	2.40E-06	1.04E-06	1.12E-05
Total > 8 days	Ci	7.36E-06	4.31E-07	2.40E-06	1.04E-06	1.12E-05
4. Tritium						
H-3	Ci	1.24E+02	2.59E+01	1.80E+02	1.73E+01	3.47E+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	1.13E-04	1.20E-04	1.15E-04	1.20E-04	4.68E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.26E-03	2.40E-03	2.30E-03	2.40E-03	4.68E-03
Beta Air Dose	mrad	3.99E-05	4.22E-05	4.04E-05	4.24E-05	1.65E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	3.99E-04	4.22E-04	4.04E-04	4.24E-04	8.25E-04
Maximum Organ Dose (excluding skin)	mrem	4.91E-02	3.42E-02	6.92E-02	3.42E-02	1.43E-01
Age		Teen	Child	Teen	Child	Teen
Organ		Lung	Bone	Lung	Bone	Lung
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	6.55E-01	4.56E-01	9.23E-01	4.56E-01	9.54E-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.

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	< 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	< 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	< LLD	< LLD	< LLD	< LLD
2. Iodines						
I-131	Ci	< LLD	2.13E-05	< LLD	1.46E-05	3.59E-05
I-132	Ci	< LLD	4.36E-04	< LLD	2.10E-04	6.45E-04
I-133	Ci	< LLD	< LLD	< LLD	4.05E-06	4.05E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	4.57E-04	< LLD	2.28E-04	6.85E-04

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	6.30E-06	6.30E-05	2.40E-06	4.87E-05	1.20E-04
Co-60	Ci	9.84E-07	1.37E-05	3.40E-07	1.19E-05	2.69E-05
Cr-51	Ci	<LLD	6.81E-05	<LLD	1.80E-04	2.49E-04
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	1.85E-06	<LLD	4.29E-06	6.14E-06
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	1.18E-06	1.69E-06	<LLD	8.21E-06	1.11E-05
Os-191	Ci	<LLD	8.24E-06	<LLD	1.82E-05	2.64E-05
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	<LLD	4.53E-07	<LLD	<LLD	4.53E-07
Sr-90	Ci	<LLD	4.39E-08	<LLD	<LLD	4.39E-08
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	<LLD	3.13E-07	3.13E-07
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	4.11E-06	4.11E-06
Total	Ci	8.46E-06	1.57E-04	2.74E-06	2.76E-04	4.44E-04
4. Tritium						
H-3	Ci	6.43E+01	5.99E+01	6.57E+01	5.83E+01	2.48E+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	1.46E-01	2.59E-01	4.32E-01	2.30E-01	1.07E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	4.33E-03	< LLD	< LLD	4.33E-03
Kr-85m	Ci	1.81E-08	< LLD	7.22E-08	1.05E-04	1.05E-04
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	2.46E-03	2.46E-03
Xe-133	Ci	6.73E-03	8.18E-01	5.63E-03	2.84E-01	1.11E+00
Xe-133m	Ci	7.81E-08	< LLD	1.48E-06	2.89E-02	2.89E-02
Xe-135	Ci	5.34E-07	4.47E-02	4.72E-05	3.87E-03	4.86E-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	1.53E-01	1.13E+00	4.38E-01	5.50E-01	2.27E+00
2. Iodines						
I-131	Ci	< LLD	9.91E-08	< LLD	8.81E-06	8.91E-06
I-132	Ci	< LLD	4.00E-06	< LLD	5.95E-04	5.99E-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	< LLD	4.10E-06	< LLD	6.03E-04	6.08E-04

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	1.46E-01	2.59E-01	4.32E-01	2.30E-01	1.07E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	4.33E-03	< LLD	< LLD	4.33E-03
Kr-85m	Ci	1.81E-08	< LLD	7.22E-08	1.05E-04	1.05E-04
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	2.46E-03	2.46E-03
Xe-133	Ci	6.73E-03	8.18E-01	5.63E-03	2.84E-01	1.11E+00
Xe-133m	Ci	7.81E-08	< LLD	1.48E-06	2.89E-02	2.89E-02
Xe-135	Ci	5.34E-07	4.47E-02	4.72E-05	3.87E-03	4.86E-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	1.53E-01	1.13E+00	4.38E-01	5.50E-01	2.27E+00
2. Iodines						
I-131	Ci	< LLD	2.14E-05	< LLD	2.34E-05	4.48E-05
I-132	Ci	< LLD	4.40E-04	< LLD	8.04E-04	1.24E-03
I-133	Ci	< LLD	< LLD	< LLD	4.05E-06	4.05E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	4.61E-04	< LLD	8.31E-04	1.29E-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	6.90E-05	< LLD	2.07E-05	8.97E-05
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	6.30E-06	6.42E-05	2.40E-06	6.83E-05	1.41E-04
Co-60	Ci	9.84E-07	1.47E-05	3.40E-07	2.14E-05	3.74E-05
Cr-51	Ci	< LLD	7.00E-05	< LLD	2.65E-04	3.35E-04
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	9.69E-07	9.69E-07
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	2.00E-06	< LLD	5.40E-06	7.40E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	1.37E-06	3.02E-06	< LLD	2.84E-05	3.28E-05
Os-191	Ci	< LLD	8.24E-06	< LLD	1.82E-05	2.64E-05
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	<LLD	4.53E-07	<LLD	<LLD	4.53E-07
Sr-90	Ci	<LLD	4.39E-08	<LLD	<LLD	4.39E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	< LLD	< LLD	< LLD	3.13E-07	3.13E-07
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	7.46E-07	< LLD	2.16E-05	2.23E-05
Total	Ci	8.65E-06	2.32E-04	2.74E-06	4.50E-04	6.94E-04
Total > 8 days	Ci	8.65E-06	1.63E-04	2.74E-06	4.29E-04	6.04E-04
4. Tritium						
H-3	Ci	7.39E+02	4.93E+02	5.85E+02	3.75E+02	2.19E+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	< LLD	< LLD
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	< LLD	< LLD	< LLD
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	< LLD	< LLD
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	< LLD
2. Iodines					
I-131	Ci	1.46E-05	2.13E-05	< LLD	3.59E-05
I-132	Ci	2.10E-04	4.36E-04	< LLD	6.45E-04
I-133	Ci	4.05E-06	< LLD	< LLD	4.05E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	2.28E-04	4.57E-04	< LLD	6.85E-04

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	5.00E-05	6.26E-05	7.77E-06	1.20E-04
Co-60	Ci	1.22E-05	1.37E-05	9.84E-07	2.69E-05
Cr-51	Ci	1.80E-04	6.81E-05	< LLD	2.49E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	4.29E-06	1.85E-06	< LLD	6.14E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	8.21E-06	1.69E-06	1.18E-06	1.11E-05
Os-191	Ci	1.71E-05	8.24E-06	1.04E-06	2.64E-05
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD
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	<LLD	4.53E-07	<LLD	4.53E-07
Sr-90	Ci	<LLD	4.39E-08	<LLD	4.39E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	3.13E-07	< LLD	< LLD	3.13E-07
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	4.11E-06	<LLD	<LLD	4.11E-06
Total	Ci	2.77E-04	1.57E-04	1.10E-05	4.44E-04
4. Tritium					
H-3	Ci	1.46E+02	1.28E+02	9.60E+01	3.70E+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	5.80E-01	3.09E-01	1.78E-01	1.07E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	4.33E-03	< LLD	4.33E-03
Kr-85m	Ci	7.22E-08	1.05E-04	< LLD	1.05E-04
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	2.46E-03	< LLD	< LLD	2.46E-03
Xe-133	Ci	2.53E-01	8.62E-01	3.35E-07	1.11E+00
Xe-133m	Ci	2.89E-02	7.81E-08	< LLD	2.89E-02
Xe-135	Ci	3.85E-03	4.47E-02	< LLD	4.86E-02
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138		< LLD	< LLD	< LLD	< LLD
Total	Ci	8.68E-01	1.22E+00	1.78E-01	2.27E+00
2. Iodines					
I-131	Ci	8.81E-06	9.91E-08	< LLD	8.91E-06
I-132	Ci	5.95E-04	4.00E-06	< LLD	5.99E-04
I-133	Ci	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.03E-04	4.10E-06	< LLD	6.08E-04

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	5.80E-01	3.09E-01	1.78E-01	1.07E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	4.33E-03	< LLD	4.33E-03
Kr-85m	Ci	7.22E-08	1.05E-04	< LLD	1.05E-04
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	2.46E-03	<LLD	<LLD	2.46E-03
Xe-133	Ci	2.53E-01	8.62E-01	3.35E-07	1.11E+00
Xe-133m	Ci	2.89E-02	7.81E-08	< LLD	2.89E-02
Xe-135	Ci	3.85E-03	4.47E-02	< LLD	4.86E-02
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	8.68E-01	1.22E+00	1.78E-01	2.27E+00
2. Iodines					
I-131	Ci	2.34E-05	2.14E-05	< LLD	4.48E-05
I-132	Ci	8.04E-04	4.40E-04	< LLD	1.24E-03
I-133	Ci	4.05E-06	< LLD	< LLD	4.05E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	8.32E-04	4.61E-04	< LLD	1.29E-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	1.06E-05	7.91E-05	< LLD	8.97E-05
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	6.96E-05	6.38E-05	7.77E-06	1.41E-04
Co-60	Ci	2.17E-05	1.47E-05	9.84E-07	3.74E-05
Cr-51	Ci	2.65E-04	7.00E-05	< LLD	3.35E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD
Cs-136	Ci	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	9.69E-07	< LLD	< LLD	9.69E-07
La-140	Ci	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	5.40E-06	2.00E-06	< LLD	7.40E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	2.84E-05	2.95E-06	1.44E-06	3.28E-05
Os-191	Ci	1.71E-05	8.24E-06	1.04E-06	2.64E-05
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD
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	<LLD	4.53E-07	<LLD	4.53E-07
Sr-90	Ci	<LLD	4.39E-08	<LLD	4.39E-08
Tc-99m	Ci	< LLD	< LLD	< LLD	< LLD
Te-123m	Ci	3.13E-07	< LLD	< LLD	3.13E-07
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	2.16E-05	7.46E-07	< LLD	2.23E-05
Total	Ci	4.40E-04	2.42E-04	1.12E-05	6.94E-04
Total > 8 days	Ci	4.30E-04	1.63E-04	1.12E-05	6.04E-04
4. Tritium					
H-3	Ci	1.01E+03	9.58E+02	3.47E+02	2.31E+03

Table 43:
Doses To Special Locations For 2014

NA:
The ENERGY INFORMATION CENTER (EIC) was relocated to an offsite location in 2011.

Table 44:
Integrated Population Dose for 2014

January to March

JAN - MAR

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	7.85E-05 .00%	7.85E-05 .00%	7.85E-05 87.85%	7.85E-05 .00%	7.85E-05 .00%	7.85E-05 .00%	7.85E-05 .00%	1.45E-04 .00%
GROUND	1.08E-05 .00%	1.08E-05 .00%	1.08E-05 12.10%	1.08E-05 .00%	1.08E-05 .00%	1.08E-05 .00%	1.08E-05 .00%	1.27E-05 .00%
INHAL	3.59E+00 28.87%	3.59E+00 28.87%	4.21E-08 .05%	3.59E+00 28.87%	3.59E+00 28.87%	3.59E+00 28.87%	3.59E+00 28.87%	3.59E+00 28.87%
VEGET	7.51E+00 60.39%	7.51E+00 60.39%	2.49E-10 .00%	7.51E+00 60.39%	7.51E+00 60.39%	7.51E+00 60.39%	7.51E+00 60.39%	7.51E+00 60.39%
COW MILK	9.72E-01 7.82%	9.72E-01 7.82%	8.35E-12 .00%	9.72E-01 7.82%	9.72E-01 7.82%	9.72E-01 7.82%	9.72E-01 7.82%	9.72E-01 7.82%
MEAT	3.64E-01 2.92%	3.64E-01 2.92%	4.34E-11 .00%	3.64E-01 2.92%	3.64E-01 2.92%	3.64E-01 2.92%	3.64E-01 2.92%	3.64E-01 2.92%
TOTAL	1.24E+01	1.24E+01	8.93E-05	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
(1) PER CAPITA DOSE (REM)	6.33E-06	6.33E-06	4.56E-11	6.33E-06	6.33E-06	6.33E-06	6.33E-06	6.33E-06

April through June

APR - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	4.05E-04 .01%	4.05E-04 .01%	4.05E-04 64.37%	4.05E-04 .01%	4.05E-04 .01%	4.05E-04 .01%	4.05E-04 .01%	1.15E-03 .03%
GROUND	1.99E-04 .01%	1.99E-04 .01%	1.99E-04 31.66%	1.99E-04 .01%	1.99E-04 .01%	1.99E-04 .01%	1.99E-04 .01%	2.34E-04 .01%
INHAL	1.19E+00 33.31%	1.19E+00 33.31%	5.57E-06 .89%	1.19E+00 33.31%	1.19E+00 33.31%	1.19E+00 33.31%	1.19E+00 33.31%	1.19E+00 33.30%
VEGET	2.01E+00 56.54%	2.01E+00 56.54%	1.88E-05 2.99%	2.01E+00 56.54%	2.01E+00 56.54%	2.01E+00 56.54%	2.01E+00 56.54%	2.01E+00 56.53%
COW MILK	2.75E-01 7.73%	2.75E-01 7.73%	5.26E-07 .08%	2.75E-01 7.73%	2.75E-01 7.73%	2.75E-01 7.73%	2.75E-01 7.73%	2.75E-01 7.73%
MEAT	8.58E-02 2.41%	8.58E-02 2.41%	2.64E-08 .00%	8.58E-02 2.41%	8.58E-02 2.41%	8.58E-02 2.41%	8.58E-02 2.41%	8.58E-02 2.41%
TOTAL	3.56E+00	3.56E+00	6.29E-04	3.56E+00	3.56E+00	3.56E+00	3.56E+00	3.56E+00
(1) PER CAPITA DOSE (REM)	1.82E-06	1.82E-06	3.21E-10	1.82E-06	1.82E-06	1.82E-06	1.82E-06	1.82E-06

Table 44: (continued)
Integrated Population Dose for2014

January through June

JAN - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	4.83E-04	4.83E-04	4.83E-04	4.83E-04	4.83E-04	4.83E-04	4.83E-04	1.29E-03
	.00%	.00%	67.29%	.00%	.00%	.00%	.00%	.01%
GROUND	2.10E-04	2.10E-04	2.10E-04	2.10E-04	2.10E-04	2.10E-04	2.10E-04	2.47E-04
	.00%	.00%	29.23%	.00%	.00%	.00%	.00%	.00%
INHAL	4.78E+00	4.78E+00	5.62E-06	4.78E+00	4.78E+00	4.78E+00	4.78E+00	4.78E+00
	29.86%	29.86%	.78%	29.86%	29.86%	29.86%	29.86%	29.85%
VEGET	9.52E+00	9.52E+00	1.88E-05	9.52E+00	9.52E+00	9.52E+00	9.52E+00	9.52E+00
	59.53%	59.53%	2.62%	59.53%	59.53%	59.53%	59.53%	59.53%
COW MILK	1.25E+00	1.25E+00	5.26E-07	1.25E+00	1.25E+00	1.25E+00	1.25E+00	1.25E+00
	7.80%	7.80%	.07%	7.80%	7.80%	7.80%	7.80%	7.80%
MEAT	4.49E-01	4.49E-01	2.65E-08	4.49E-01	4.49E-01	4.49E-01	4.49E-01	4.49E-01
	2.81%	2.81%	.00%	2.81%	2.81%	2.81%	2.81%	2.81%
TOTAL	1.60E+01	1.60E+01	7.18E-04	1.60E+01	1.60E+01	1.60E+01	1.60E+01	1.60E+01
(1)								
PER CAPITA DOSE (REM)	8.17E-06	8.17E-06	3.67E-10	8.17E-06	8.17E-06	8.17E-06	8.17E-06	8.17E-06

July through September

JUL - SEP

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.38E-04	1.38E-04	1.38E-04	1.38E-04	1.38E-04	1.38E-04	1.38E-04	2.47E-04
	.00%	.00%	97.19%	.00%	.00%	.00%	.00%	.01%
GROUND	4.01E-06	4.01E-06	4.01E-06	4.01E-06	4.01E-06	4.01E-06	4.01E-06	4.71E-06
	.00%	.00%	2.81%	.00%	.00%	.00%	.00%	.00%
INHAL	9.42E-01	9.42E-01	0.00E+00	9.42E-01	9.42E-01	9.42E-01	9.42E-01	9.42E-01
	32.39%	32.39%	.00%	32.39%	32.39%	32.39%	32.39%	32.39%
VEGET	1.67E+00	1.67E+00	0.00E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00
	57.42%	57.42%	.00%	57.42%	57.42%	57.42%	57.42%	57.42%
COW MILK	2.25E-01	2.25E-01	0.00E+00	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01
	7.74%	7.74%	.00%	7.74%	7.74%	7.74%	7.74%	7.74%
MEAT	7.09E-02	7.09E-02	0.00E+00	7.09E-02	7.09E-02	7.09E-02	7.09E-02	7.09E-02
	2.44%	2.44%	.00%	2.44%	2.44%	2.44%	2.44%	2.44%
TOTAL	2.91E+00	2.91E+00	1.42E-04	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00
(1)								
PER CAPITA DOSE (REM)	1.49E-06	1.49E-06	7.25E-11	1.49E-06	1.49E-06	1.49E-06	1.49E-06	1.49E-06

Table 44: (continued)
Integrated Population Dose for2014

October through December

OCT - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.28E-04	2.28E-04	2.28E-04	2.28E-04	2.28E-04	2.28E-04	2.28E-04	6.78E-04
	.00%	.00%	57.00%	.00%	.00%	.00%	.00%	.01%
GROUND	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.92E-04
	.00%	.00%	40.91%	.00%	.00%	.00%	.00%	.00%
INHAL	1.45E+00	1.45E+00	6.59E-06	1.45E+00	1.45E+00	1.45E+00	1.45E+00	1.45E+00
	26.82%	26.82%	1.65%	26.82%	26.82%	26.82%	26.82%	26.82%
VEGET	3.40E+00	3.40E+00	1.61E-06	3.40E+00	3.40E+00	3.40E+00	3.40E+00	3.40E+00
	62.80%	62.80%	.40%	62.80%	62.80%	62.80%	62.79%	62.79%
COW MILK	4.03E-01	4.03E-01	1.59E-07	4.03E-01	4.03E-01	4.03E-01	4.03E-01	4.03E-01
	7.44%	7.44%	.04%	7.44%	7.44%	7.44%	7.44%	7.44%
MEAT	1.59E-01	1.59E-01	6.78E-09	1.59E-01	1.59E-01	1.59E-01	1.59E-01	1.59E-01
	2.93%	2.93%	.00%	2.93%	2.93%	2.93%	2.93%	2.93%
TOTAL	5.41E+00	5.41E+00	4.00E-04	5.41E+00	5.41E+00	5.41E+00	5.41E+00	5.41E+00
(1)								
PER CAPITA DOSE (REM)	2.76E-06	2.76E-06	2.04E-10	2.76E-06	2.76E-06	2.76E-06	2.76E-06	2.76E-06

July through December

JUL - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04	9.25E-04
	.00%	.00%	67.55%	.00%	.00%	.00%	.00%	.01%
GROUND	1.67E-04	1.67E-04	1.67E-04	1.67E-04	1.67E-04	1.67E-04	1.67E-04	1.97E-04
	.00%	.00%	30.90%	.00%	.00%	.00%	.00%	.00%
INHAL	2.39E+00	2.39E+00	6.59E-06	2.39E+00	2.39E+00	2.39E+00	2.39E+00	2.39E+00
	28.77%	28.77%	1.22%	28.77%	28.77%	28.77%	28.77%	28.76%
VEGET	5.07E+00	5.07E+00	1.61E-06	5.07E+00	5.07E+00	5.07E+00	5.07E+00	5.07E+00
	60.92%	60.92%	.30%	60.92%	60.92%	60.92%	60.92%	60.92%
COW MILK	6.28E-01	6.28E-01	1.59E-07	6.28E-01	6.28E-01	6.28E-01	6.28E-01	6.28E-01
	7.55%	7.55%	.03%	7.55%	7.55%	7.55%	7.55%	7.55%
MEAT	2.30E-01	2.30E-01	6.78E-09	2.30E-01	2.30E-01	2.30E-01	2.30E-01	2.30E-01
	2.76%	2.76%	.00%	2.76%	2.76%	2.76%	2.76%	2.76%
TOTAL	8.32E+00	8.32E+00	5.42E-04	8.32E+00	8.32E+00	8.32E+00	8.32E+00	8.32E+00
(1)								
PER CAPITA DOSE (REM)	4.25E-06	4.25E-06	2.77E-10	4.25E-06	4.25E-06	4.25E-06	4.25E-06	4.25E-06

Table 44: (continued)
Integrated Population Dose for 2014

January through December

JAN - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	8.49E-04	8.49E-04	8.49E-04	8.49E-04	8.49E-04	8.49E-04	8.49E-04	2.22E-03
	.00%	.00%	67.40%	.00%	.00%	.00%	.00%	.01%
GROUND	3.77E-04	3.77E-04	3.77E-04	3.77E-04	3.77E-04	3.77E-04	3.77E-04	4.44E-04
	.00%	.00%	29.95%	.00%	.00%	.00%	.00%	.00%
INHAL	7.17E+00	7.17E+00	1.22E-05	7.17E+00	7.17E+00	7.17E+00	7.17E+00	7.17E+00
	29.48%	29.48%	.97%	29.48%	29.48%	29.48%	29.48%	29.48%
VEGET	1.46E+01	1.46E+01	2.04E-05	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01
	60.01%	60.01%	1.62%	60.01%	60.01%	60.01%	60.01%	60.00%
COW MILK	1.88E+00	1.88E+00	6.85E-07	1.88E+00	1.88E+00	1.88E+00	1.88E+00	1.88E+00
	7.71%	7.71%	.05%	7.71%	7.71%	7.71%	7.71%	7.71%
MEAT	6.79E-01	6.79E-01	3.33E-08	6.79E-01	6.79E-01	6.79E-01	6.79E-01	6.79E-01
	2.79%	2.79%	.00%	2.79%	2.79%	2.79%	2.79%	2.79%
TOTAL	2.43E+01	2.43E+01	1.26E-03	2.43E+01	2.43E+01	2.43E+01	2.43E+01	2.43E+01
(1)								
PER CAPITA DOSE (REM)	1.24E-05	1.24E-05	6.43E-10	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05

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

Table 45:
Summary of Individual Doses for 2014
Radiation Doses At And Beyond The Site Boundary

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	3.74E-04	3.02E-04	3.93E-04	5.60E-04	1.30E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	7.48E-03	6.04E-03	7.86E-03	1.12E-02	1.30E-02
Beta Air Dose	mrad	1.34E-04	1.99E-04	1.39E-04	2.90E-04	6.19E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	1.34E-03	1.99E-03	1.39E-03	2.90E-03	3.10E-03
Maximum Individual						
Total Body	mrem	2.50E-04	1.99E-04	2.61E-04	3.69E-04	8.59E-04
Skin	mrem	4.00E-04	3.47E-04	4.20E-04	6.24E-04	1.43E-03
Location						
Unit 1	miles	1.27 SE	0.66 NNE	0.66 NNE	1.27 SE	1.70 SSE
Unit 2	miles	1.31 SE	0.83 NNE	0.83 NNE	1.31 SE	1.88 SSE
Unit 3	miles	1.40 SE	1.05 NNE	1.05 NNE	1.40 SE	1.73 SSE
Maximum Organ Dose(1) From All Radionuclides						
	Age	Child	Child	Child	Child	Child
	Organ	Bone	Bone	Bone	Bone	Bone
	mrem	1.23E+00	1.15E+00	8.09E-01	7.65E-01	3.96E+00
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	1.64E+01	1.53E+01	1.08E+01	1.02E+01	2.64E+01
Location						
Unit 1	miles	2.74 S	2.84 NNE	2.43 ENE	2.74 S	2.74 S
Unit 2	miles	2.56 S	3.05 NNE	2.63 ENE	2.56 S	2.56 S
Unit 3	miles	2.35 S	3.28 NNE	2.80 ENE	2.35 S	2.35 S
Maximum Organ Dose(1) From All Radionuclides Excluding C-14						
	Age	Teen	Infant	Child	Teen	Teen
	Organ	Thyroid (2)	Thyroid (2)	Thyroid (2)	Thyroid (2)	Thyroid (2)
	mrem	2.47E-01	1.13E-01	8.95E-02	1.08E-01	4.69E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	3.29E+00	1.51E+00	1.19E+00	1.44E+00	3.13E+00
Organ Dose from tritium only for Unit 2 location above	mrem	2.47E-01	1.12E-01	8.95E-02	1.08E-01	4.68E-01
Fraction of organ dose from tritum only for Unit 2 location above	%	100	99.12	100	100	99.79
X/Q for Unit 2 location above	sec/m^3	8.17E-06	9.72E-07	7.38E-07	7.58E-06	5.30E-06
D/Q for Unit 2 location above	m-2	2.50E-09	2.24E-09	1.45E-09	2.56E-09	1.85E-09

(1) Excluding skin

(2) 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

2015 ARERR Errata

The following permits had the tritium activity removed from the report because the reported tritium activity was the result of interference from the operation of the boric acid concentrator (BAC): 20152013, 20152016, 20152018, 20152020, 20152147, 20152152, 20152160, 20152163 and 20152167.

The following permits had the tritium activity removed from the report because the activity reported was the result of refueling activities and the tritium activity released is already accounted for on Refueling Purge batch permits: 20152132, 20152137, 20152140, 20153056 and 20153062.

The Ar-41 activity on permit 20152130 was adjusted to account for decay and the available source term being limited to one CTMT volume.

Permits having a release duration greater than 216 hours were accounted for as a continuous release.

Table 1: Evaporation Pond Data was revised to correct an error when calculating the Average Tritium Concentration.

Site Boundary inhalation doses were calculated with unit specific X/Q and the entire estimated C-14 released.

The following pages contain the corrections to the 2015 ARERR.

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: NCRPReport No. 160, Table 1.1.

The PVNGS calculated production of carbon-14 is 18.5 Curies per operating cycle (500 days) or 13.5 curies per year. The 13.5 curies will be divided equally between each quarter (3.38 curies per reactor). The estimated C-14 activity is included in all of the inhalation and ingestion dose calculations.

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 Dose Summary

Dose for 2015 was primarily due to the release of tritium. Tritium production is estimated to be 1000 curies per Reactor Unit per year. In order to control plant tritium concentrations, tritium releases should match tritium production. For 2015, PVNGS released a total of 2010 curies of tritium (see Table 39).

Table 1: Evaporation Pond Data					
Evaporation Pond 1(1A, 1B, 1C)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	3.22E+11	8.85E+11	8.85E+11	3.22E+11	
Tritium Concentration (uCi/cc)	7.48E-07	1.07E-06	1.00E-06	1.36E-06	
Tritium Curies	2.41E-01	9.49E-01	8.88E-01	4.39E-01	2.52E+00
Evaporation Pond 2 (2A and 2B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.89E+11	7.94E+11	7.94E+11	2.89E+11	
Tritium Concentration (uCi/cc)	6.75E-07	7.00E-07	6.94E-07	5.66E-07	
Tritium curies	1.95E-01	5.56E-01	5.51E-01	1.63E-01	1.46E+00
Evaporation Pond 3 (3A and 3B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.20E+11	6.04E+11	6.04E+11	2.20E+11	
Tritium Concentration (uCi/cc)	8.68E-07	7.25E-07	8.01E-07	7.82E-07	
3B Tritium curies	1.91E-01	4.37E-01	4.84E-01	1.72E-01	1.28E+00
Dose (mRem)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Pond 1	3.34E-03	1.32E-02	1.23E-02	6.09E-03	3.49E-02
Pond 2	2.70E-03	7.71E-03	7.64E-03	2.26E-03	2.03E-02
Pond 3	2.64E-03	6.07E-03	6.71E-03	2.38E-03	1.78E-02
Total	8.69E-03	2.69E-02	2.67E-02	1.07E-02	7.30E-02

Table 2: Batch Release Data			
ALL TIMES ARE IN HOURS	UNIT 1	UNIT 2	UNIT 3
January - June			
Number of batch releases	20	24	44
Total time period for batch releases	114.54	366.34	1491.06
Maximum time period for a batch release	92.00	105.90	216.00
Average time period for a batch release	5.73	15.26	33.89
Minimum time period for a batch release	0.53	0.51	0.10
July - December			
Number of batch releases	21	42	19
Total time period for batch releases	161.18	1501.48	198.17
Maximum time period for a batch release	103.80	168.00	123.75
Average time period for a batch release	7.68	35.75	10.43
Minimum time period for a batch release	0.52	0.18	0.50
January - December			
Number of batch releases	41	66	63
Total time period for batch releases	275.72	1867.82	1689.23
Maximum time period for a batch release	103.80	168.00	216.00
Average time period for a batch release	6.72	28.30	26.81
Minimum time period for a batch release	0.52	0.18	0.10

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	5.87E-02	6.86E-02	7.22E-02	5.02E-02	2.50E-01	3.54E+01
2. Average release rate for period	µCi/sec	7.55E-03	8.73E-03	9.08E-03	6.32E-03	7.93E-03	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
B. Iodine 131							
1. Total Iodine 131	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	3.32E+01
2. Average release rate for period	µCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	
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	7.35E-07	3.25E-07	<LLD	6.73E-07	1.73E-06	3.43E+01
2. Average release rate for period	µCi/sec	9.45E-08	4.13E-08	<LLD	8.47E-08	5.49E-08	
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	2.03E+01	9.09E+01	2.14E+01	1.98E+02	3.31E+02	3.85E+01
2. Average release rate for period	µCi/sec	2.61E+00	1.16E+01	2.69E+00	2.49E+01	1.05E+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	<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	<LLD	<LLD	<LLD	<LLD
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 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	7.35E-07	<LLD	<LLD	<LLD	7.35E-07
Co-60	Ci	<LLD	3.25E-07	<LLD	6.73E-07	9.98E-07
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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Total	Ci	7.35E-07	3.25E-07	<LLD	6.73E-07	1.73E-06
4.Tritium						
H-3	Ci	2.03E+01	2.90E+01	2.14E+01	2.47E+01	9.54E+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	5.85E-02	6.86E-02	7.22E-02	5.02E-02	2.50E-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	2.15E-04	<LLD	<LLD	<LLD	2.15E-04
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	5.87E-02	6.86E-02	7.22E-02	5.02E-02	2.50E-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 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	<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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
4.Tritium						
H-3	Ci	6.18E-03	6.19E+01	1.76E-02	1.74E+02	2.36E+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	5.85E-02	6.86E-02	7.22E-02	5.02E-02	2.50E-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	2.15E-04	<LLD	<LLD	<LLD	2.15E-04
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	5.87E-02	6.86E-02	7.22E-02	5.02E-02	2.50E-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 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	<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	7.35E-07	<LLD	<LLD	<LLD	7.35E-07
Co-60	Ci	<LLD	3.25E-07	<LLD	6.73E-07	9.98E-07
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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Total	Ci	7.35E-07	3.25E-07	<LLD	6.73E-07	1.73E-06
Total > 8 days	Ci	7.35E-07	3.25E-07	<LLD	6.73E-07	1.73E-06
4.Tritium						
H-3	Ci	2.03E+01	9.09E+01	2.14E+01	1.98E+02	3.31E+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	1.29E-04	1.51E-04	1.59E-04	1.11E-04	5.50E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.58E-03	3.02E-03	3.18E-03	2.21E-03	5.50E-03
Beta Air Dose	mrad	4.55E-05	5.33E-05	5.61E-05	3.90E-05	1.94E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	4.55E-04	5.33E-04	5.61E-04	3.90E-04	9.69E-04
Maximum Organ Dose (excluding skin)	mrem	2.87E-02	3.13E-02	2.87E-02	6.37E-02	1.15E-01
Age		Child	Teen	Child	Teen	Teen
Organ		Bone	Lung	Bone	Lung	Lung
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	3.83E-01	4.17E-01	3.83E-01	8.49E-01	7.69E-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.

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	8.53E-02	9.98E-02	1.12E-01	2.10E+00	2.40E+00	3.54E+01
2. Average release rate for period	µCi/sec	1.10E-02	1.27E-02	1.41E-02	2.65E+00	7.61E-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	<LLD	<LLD	<LLD	2.38E-05	2.38E-05	3.32E+01
2. Average release rate for period	µCi/sec	<LLD	<LLD	<LLD	2.99E-06	7.54E-07	
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	<LLD	<LLD	<LLD	8.97E-04	8.97E-04	3.43E+01
2. Average release rate for period	µCi/sec	<LLD	<LLD	<LLD	1.13E-04	2.84E-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	3.14E+02	1.04E+02	1.76E+02	2.92E+02	8.86E+02	3.85E+01
2. Average release rate for period	µCi/sec	4.04E+01	1.32E+01	2.21E+01	3.67E+01	2.81E+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	<LLD	<LLD	2.96E-01	2.96E-01
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	<LLD	<LLD	2.96E-01	2.96E-01
2. Iodines						
I-131	Ci	<LLD	<LLD	<LLD	2.38E-05	2.38E-05
I-132	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-133	Ci	<LLD	<LLD	<LLD	5.84E-06	5.84E-06
I-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	<LLD	<LLD	2.96E-05	2.96E-05

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	<LLD	<LLD	<LLD	3.34E-05	3.34E-05
Co-60	Ci	<LLD	<LLD	<LLD	2.12E-05	2.12E-05
Cr-51	Ci	<LLD	<LLD	<LLD	7.32E-05	7.32E-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	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	7.84E-06	7.84E-06
Os-191	Ci	<LLD	<LLD	<LLD	3.00E-06	3.00E-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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	<LLD	<LLD	1.39E-04	1.39E-04
4. Tritium						
H-3	Ci	2.34E+01	2.60E+01	2.12E+01	3.55E+01	1.06E+02

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	7.29E-02	8.42E-02	9.39E-02	7.57E-02	3.27E-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	9.77E-04	9.77E-04
Xe-133	Ci	1.24E-02	1.56E-02	1.79E-02	1.73E+00	1.77E+00
Xe-133m	Ci	<LLD	<LLD	<LLD	1.38E-03	1.38E-03
Xe-135	Ci	<LLD	<LLD	9.12E-05	<LLD	9.12E-05
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	8.53E-02	9.98E-02	1.12E-01	1.81E+00	2.10E+00
2. Iodines						
I-131	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-132	Ci	<LLD	<LLD	<LLD	7.30E-05	7.30E-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	<LLD	<LLD	7.30E-05	7.30E-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	<LLD	<LLD	5.90E-05	5.90E-05
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	1.24E-04	1.24E-04
Co-60	Ci	<LLD	<LLD	<LLD	5.32E-05	5.32E-05
Cr-51	Ci	<LLD	<LLD	<LLD	5.42E-04	5.42E-04
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	3.90E-05	3.90E-05
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	8.17E-04	8.17E-04
4. Tritium						
H-3	Ci	2.91E+02	7.82E+01	1.54E+02	2.56E+02	7.80E+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	7.29E-02	8.42E-02	9.39E-02	7.57E-02	3.27E-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	9.77E-04	9.77E-04
Xe-133	Ci	1.24E-02	1.56E-02	1.79E-02	2.02E+00	2.07E+00
Xe-133m	Ci	<LLD	<LLD	<LLD	1.38E-03	1.38E-03
Xe-135	Ci	<LLD	<LLD	9.12E-05	<LLD	9.12E-05
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	8.53E-02	9.98E-02	1.12E-01	2.10E+00	2.40E+00
2. Iodines						
I-131	Ci	<LLD	<LLD	<LLD	2.38E-05	2.38E-05
I-132	Ci	<LLD	<LLD	<LLD	7.30E-05	7.30E-05
I-133	Ci	<LLD	<LLD	<LLD	5.84E-06	5.84E-06
I-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	<LLD	<LLD	1.03E-04	1.03E-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	<LLD	<LLD	5.90E-05	5.90E-05
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	1.58E-04	1.58E-04
Co-60	Ci	<LLD	<LLD	<LLD	7.44E-05	7.44E-05
Cr-51	Ci	<LLD	<LLD	<LLD	6.15E-04	6.15E-04
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	4.69E-05	4.69E-05
Os-191	Ci	<LLD	<LLD	<LLD	3.00E-06	3.00E-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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	<LLD	<LLD	9.56E-04	9.56E-04
Total > 8 days	Ci	<LLD	<LLD	<LLD	8.97E-04	8.97E-04
4. Tritium						
H-3	Ci	3.14E+02	1.04E+02	1.76E+02	2.92E+02	8.86E+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	1.71E-04	1.97E-04	2.20E-04	3.42E-04	9.31E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	3.41E-03	3.95E-03	4.40E-03	6.85E-03	9.31E-03
Beta Air Dose	mrad	6.44E-05	7.49E-05	8.38E-05	8.13E-04	1.04E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	6.44E-04	7.49E-04	8.38E-04	8.13E-03	5.18E-03
Maximum Organ Dose (excluding skin)	mrem	1.04E-01	3.73E-02	6.01E-02	9.73E-02	2.99E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		T. Body	T. Body	T. Body	Lung	Lung
ODCM Req. 4.2 Limit	%	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	1.39E+00	4.97E-01	8.01E-01	1.30E+00	1.99E+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 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	1.02E-01	7.57E-02	3.74E-02	4.77E-02	2.63E-01	3.54E+01
2. Average release rate for period	µCi/sec	1.31E-02	9.62E-03	4.70E-03	6.00E-03	8.33E-03	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
B. Iodine 131							
1. Total Iodine 131	Ci	<LLD	4.89E-05	<LLD	<LLD	4.89E-05	3.32E+01
2. Average release rate for period	µCi/sec	<LLD	6.21E-06	<LLD	<LLD	1.55E-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	<LLD	7.90E-03	1.20E-06	<LLD	7.91E-03	3.43E+01
2. Average release rate for period	µCi/sec	<LLD	1.01E-03	1.51E-07	<LLD	2.51E-04	
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	2.36E+02	4.00E+02	2.41E+01	1.36E+02	7.96E+02	3.85E+01
2. Average release rate for period	µCi/sec	3.04E+01	5.08E+01	3.03E+00	1.71E+01	2.52E+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	<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	<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	<LLD	<LLD	<LLD	<LLD
2. Iodines						
I-131	Ci	<LLD	1.71E-05	<LLD	<LLD	1.71E-05
I-132	Ci	<LLD	1.53E-04	<LLD	<LLD	1.53E-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	<LLD	1.70E-04	<LLD	<LLD	1.70E-04

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	<LLD	5.98E-04	3.12E-07	<LLD	5.98E-04
Co-60	Ci	<LLD	1.02E-04	<LLD	<LLD	1.02E-04
Cr-51	Ci	<LLD	8.82E-04	<LLD	<LLD	8.82E-04
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	4.28E-05	<LLD	<LLD	4.28E-05
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	2.60E-05	<LLD	<LLD	2.60E-05
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	8.07E-05	<LLD	<LLD	8.07E-05
Os-191	Ci	<LLD	2.98E-06	8.92E-07	<LLD	3.87E-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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	1.88E-06	<LLD	<LLD	1.88E-06
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	5.76E-05	<LLD	<LLD	5.76E-05
Total	Ci	<LLD	1.79E-03	1.20E-06	<LLD	1.79E-03
4. Tritium						
H-3	Ci	1.57E+01	3.60E+01	2.41E+01	2.13E+01	9.71E+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	1.02E-01	4.62E-02	3.74E-02	4.77E-02	2.29E-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	4.49E-04	<LLD	<LLD	4.49E-04
Xe-133	Ci	<LLD	3.25E-02	<LLD	<LLD	3.25E-02
Xe-133m	Ci	<LLD	1.26E-04	<LLD	<LLD	1.26E-04
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	1.02E-01	7.57E-02	3.74E-02	4.77E-02	2.63E-01
2. Iodines						
I-131	Ci	<LLD	3.17E-05	<LLD	<LLD	3.17E-05
I-132	Ci	<LLD	4.06E-04	<LLD	<LLD	4.06E-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	<LLD	4.37E-04	<LLD	<LLD	4.37E-04

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	3.70E-05	<LLD	<LLD	3.70E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	7.88E-06	<LLD	<LLD	7.88E-06
Co-58	Ci	<LLD	7.05E-04	<LLD	<LLD	7.05E-04
Co-60	Ci	<LLD	4.08E-04	<LLD	<LLD	4.08E-04
Cr-51	Ci	<LLD	3.50E-03	<LLD	<LLD	3.50E-03
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	1.79E-04	<LLD	<LLD	1.79E-04
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	1.03E-04	<LLD	<LLD	1.03E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	6.10E-04	<LLD	<LLD	6.10E-04
Os-191	Ci	<LLD	1.02E-04	<LLD	<LLD	1.02E-04
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	1.61E-05	<LLD	<LLD	1.61E-05
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	4.79E-04	<LLD	<LLD	4.79E-04
Total	Ci	<LLD	6.15E-03	<LLD	<LLD	6.15E-03
4. Tritium						
H-3	Ci	2.20E+02	3.64E+02	9.79E-02	1.14E+02	6.99E+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	1.02E-01	4.26E-02	3.74E-02	4.77E-02	2.29E-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	4.49E-04	<LLD	<LLD	4.49E-04
Xe-133	Ci	<LLD	3.25E-02	<LLD	<LLD	3.25E-02
Xe-133m	Ci	<LLD	1.26E-04	<LLD	<LLD	1.26E-04
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	1.02E-01	7.57E-02	3.74E-02	4.77E-02	2.63E-01
2. Iodines						
I-131	Ci	<LLD	4.89E-05	<LLD	<LLD	4.89E-05
I-132	Ci	<LLD	5.59E-04	<LLD	<LLD	5.59E-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	<LLD	6.08E-04	<LLD	<LLD	6.08E-04

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	3.70E-05	<LLD	<LLD	3.70E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	7.88E-06	<LLD	<LLD	7.88E-06
Co-58	Ci	<LLD	1.30E-03	3.12E-07	<LLD	1.30E-03
Co-60	Ci	<LLD	5.10E-04	<LLD	<LLD	5.10E-04
Cr-51	Ci	<LLD	4.38E-03	<LLD	<LLD	4.38E-03
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	2.22E-04	<LLD	<LLD	2.22E-04
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	1.29E-04	<LLD	<LLD	1.29E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	6.90E-04	<LLD	<LLD	6.90E-04
Os-191	Ci	<LLD	1.05E-04	8.92E-07	<LLD	1.06E-04
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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	1.80E-05	<LLD	<LLD	1.80E-05
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	5.37E-04	<LLD	<LLD	5.37E-04
Total	Ci	<LLD	7.94E-03	1.20E-06	<LLD	7.94E-03
Total > 8 days	Ci	<LLD	7.90E-03	1.20E-06	<LLD	7.91E-03
4. Tritium						
H-3	Ci	2.36E+02	4.00E+02	2.41E+01	1.36E+02	7.96E+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	2.67E-04	1.15E-04	9.82E-05	1.25E-04	6.06E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	5.35E-03	2.30E-03	1.96E-03	2.51E-03	6.06E-03
Beta Air Dose	mrad	9.43E-05	5.32E-05	3.46E-05	4.42E-05	2.26E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	9.43E-04	5.32E-04	3.46E-04	4.42E-04	1.13E-03
Maximum Organ Dose (excluding skin)	mrem	8.95E-02	1.51E-01	3.42E-02	5.34E-02	3.07E-01
Age		Teen	Teen	Child	Teen	Teen
Organ		T. Body	Lung	Bone	T. Body	Lung
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	1.19E+00	2.01E+00	4.56E-01	7.12E-01	2.05E+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 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	<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	2.96E-01	2.96E-01
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	<LLD	<LLD	2.96E-01	2.96E-01
2. Iodines						
I-131	Ci	<LLD	1.71E-05	<LLD	2.38E-05	4.09E-05
I-132	Ci	<LLD	1.53E-04	<LLD	<LLD	1.53E-04
I-133	Ci	<LLD	<LLD	<LLD	5.84E-06	5.84E-06
I-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	1.70E-04	<LLD	2.96E-05	2.00E-04

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	7.35E-07	5.98E-04	3.12E-07	3.34E-05	6.32E-04
Co-60	Ci	<LLD	1.02E-04	<LLD	2.19E-05	1.24E-04
Cr-51	Ci	<LLD	8.82E-04	<LLD	7.32E-05	9.56E-04
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	4.28E-05	<LLD	<LLD	4.28E-05
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	2.60E-05	<LLD	<LLD	2.60E-05
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	8.07E-05	<LLD	7.84E-06	8.85E-05
Os-191	Ci	<LLD	2.98E-06	8.92E-07	3.00E-06	6.87E-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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	1.88E-06	<LLD	<LLD	1.88E-06
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	5.76E-05	<LLD	<LLD	5.76E-05
Total	Ci	7.35E-07	1.79E-03	1.20E-06	1.39E-04	1.94E-03
4. Tritium						
H-3	Ci	5.94E+01	9.09E+01	6.67E+01	8.16E+01	2.99E+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	2.33E-01	1.95E-01	2.03E-01	1.74E-01	8.06E-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	4.49E-04	<LLD	9.77E-04	1.43E-03
Xe-133	Ci	1.26E-02	4.81E-02	1.79E-02	1.73E+00	1.81E+00
Xe-133m	Ci	<LLD	1.26E-04	<LLD	1.38E-03	1.50E-03
Xe-135	Ci	<LLD	<LLD	9.12E-05	<LLD	9.12E-05
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	2.46E-01	2.44E-01	2.21E-01	1.91E+00	2.62E+00
2. Iodines						
I-131	Ci	<LLD	3.17E-05	<LLD	<LLD	3.17E-05
I-132	Ci	<LLD	4.06E-04	<LLD	7.30E-05	4.79E-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	<LLD	4.37E-04	<LLD	7.30E-05	5.10E-04

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	3.70E-05	<LLD	5.90E-05	9.60E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	7.88E-06	<LLD	<LLD	7.88E-06
Co-58	Ci	<LLD	7.05E-04	<LLD	1.24E-04	8.29E-04
Co-60	Ci	<LLD	4.08E-04	<LLD	5.32E-05	4.62E-04
Cr-51	Ci	<LLD	3.50E-03	<LLD	5.42E-04	4.04E-03
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	1.79E-04	<LLD	<LLD	1.79E-04
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	1.03E-04	<LLD	<LLD	1.03E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	6.10E-04	<LLD	3.90E-05	6.49E-04
Os-191	Ci	<LLD	1.02E-04	<LLD	<LLD	1.02E-04
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	1.61E-05	<LLD	<LLD	1.61E-05
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	4.79E-04	<LLD	<LLD	4.79E-04
Total	Ci	<LLD	6.15E-03	<LLD	8.17E-04	6.97E-03
4. Tritium						
H-3	Ci	5.11E+02	5.04E+02	1.54E+02	5.44E+02	1.71E+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	2.33E-01	1.95E-01	2.03E-01	1.74E-01	8.06E-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	4.49E-04	<LLD	9.77E-04	1.43E-03
Xe-133	Ci	1.26E-02	4.81E-02	1.79E-02	2.02E+00	2.10E+00
Xe-133m	Ci	<LLD	1.26E-04	<LLD	1.38E-03	1.50E-03
Xe-135	Ci	<LLD	<LLD	9.12E-05	<LLD	9.12E-05
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	2.46E-01	2.44E-01	2.21E-01	2.20E+00	2.91E+00
2. Iodines						
I-131	Ci	<LLD	4.89E-05	<LLD	2.38E-05	7.26E-05
I-132	Ci	<LLD	5.59E-04	<LLD	7.30E-05	6.32E-04
I-133	Ci	<LLD	<LLD	<LLD	5.84E-06	5.84E-06
I-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	6.08E-04	<LLD	1.03E-04	7.10E-04

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	3.70E-05	<LLD	5.90E-05	9.60E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	7.88E-06	<LLD	<LLD	7.88E-06
Co-58	Ci	7.35E-07	1.30E-03	3.12E-07	1.58E-04	1.46E-03
Co-60	Ci	<LLD	5.10E-04	<LLD	7.50E-05	5.85E-04
Cr-51	Ci	<LLD	4.38E-03	<LLD	6.15E-04	5.00E-03
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	2.22E-04	<LLD	<LLD	2.22E-04
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	1.29E-04	<LLD	<LLD	1.29E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	6.90E-04	<LLD	4.69E-05	7.37E-04
Os-191	Ci	<LLD	1.05E-04	8.92E-07	3.00E-06	1.09E-04
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	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	1.80E-05	<LLD	<LLD	1.80E-05
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	5.37E-04	<LLD	<LLD	5.37E-04
Total	Ci	7.35E-07	7.94E-03	1.20E-06	9.57E-04	8.90E-03
Total > 8 days	Ci	7.35E-07	7.90E-03	1.20E-06	8.98E-04	8.80E-03
4. Tritium						
H-3	Ci	5.71E+02	5.95E+02	2.21E+02	6.26E+02	2.01E+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	<LLD	<LLD
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	2.96E-01	<LLD	2.96E-01
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-137	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	2.96E-01	<LLD	2.96E-01
2. Iodines					
I-131	Ci	<LLD	2.38E-05	1.71E-05	4.09E-05
I-132	Ci	<LLD	<LLD	1.53E-04	1.53E-04
I-133	Ci	<LLD	5.84E-06	<LLD	5.84E-06
I-134	Ci	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	2.96E-05	1.70E-04	2.00E-04

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	7.35E-07	3.34E-05	5.98E-04	6.32E-04
Co-60	Ci	9.98E-07	2.12E-05	1.02E-04	1.24E-04
Cr-51	Ci	<LLD	7.32E-05	8.82E-04	9.56E-04
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	4.28E-05	4.28E-05
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	2.60E-05	2.60E-05
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	7.84E-06	8.07E-05	8.85E-05
Os-191	Ci	<LLD	3.00E-06	3.87E-06	6.87E-06
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	1.88E-06	1.88E-06
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	5.76E-05	5.76E-05
Total	Ci	1.73E-06	1.39E-04	1.79E-03	1.94E-03
4. Tritium					
H-3	Ci	9.54E+01	1.06E+02	9.71E+01	2.99E+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	2.50E-01	3.27E-01	2.29E-01	8.06E-01
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	9.77E-04	4.49E-04	1.43E-03
Xe-133	Ci	2.15E-04	1.77E+00	3.25E-02	1.81E+00
Xe-133m	Ci	<LLD	1.38E-03	1.26E-04	1.50E-03
Xe-135	Ci	<LLD	9.12E-05	<LLD	9.12E-05
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-137	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	2.50E-01	2.10E+00	2.63E-01	2.62E+00
2. Iodines					
I-131	Ci	<LLD	<LLD	3.17E-05	3.17E-05
I-132	Ci	<LLD	7.30E-05	4.06E-04	4.79E-04
I-133	Ci	<LLD	<LLD	<LLD	<LLD
I-134	Ci	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	7.30E-05	4.37E-04	5.10E-04

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	<LLD	5.90E-05	3.70E-05	9.60E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	7.88E-06	7.88E-06
Co-58	Ci	<LLD	1.24E-04	7.05E-04	8.29E-04
Co-60	Ci	<LLD	5.32E-05	4.08E-04	4.62E-04
Cr-51	Ci	<LLD	5.42E-04	3.50E-03	4.04E-03
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	1.79E-04	1.79E-04
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	1.03E-04	1.03E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	3.90E-05	6.10E-04	6.49E-04
Os-191	Ci	<LLD	<LLD	1.02E-04	1.02E-04
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
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	1.61E-05	1.61E-05
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	4.79E-04	4.79E-04
Total	Ci	<LLD	8.17E-04	6.15E-03	6.97E-03
4. Tritium					
H-3	Ci	2.36E+02	7.80E+02	6.99E+02	1.71E+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	2.50E-01	3.27E-01	2.29E-01	8.06E-01
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	9.77E-04	4.49E-04	1.43E-03
Xe-133	Ci	2.15E-04	2.07E+00	3.25E-02	2.10E+00
Xe-133m	Ci	<LLD	1.38E-03	1.26E-04	1.50E-03
Xe-135	Ci	<LLD	9.12E-05	<LLD	9.12E-05
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-137	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	2.50E-01	2.40E+00	2.63E-01	2.91E+00
2. Iodines					
I-131	Ci	<LLD	2.38E-05	4.89E-05	7.26E-05
I-132	Ci	<LLD	7.30E-05	5.59E-04	6.32E-04
I-133	Ci	<LLD	5.84E-06	<LLD	5.84E-06
I-134	Ci	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	<LLD	1.03E-04	6.08E-04	7.10E-04

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	<LLD	5.90E-05	3.70E-05	9.60E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	7.88E-06	7.88E-06
Co-58	Ci	7.35E-07	1.58E-04	1.30E-03	1.46E-03
Co-60	Ci	9.98E-07	7.44E-05	5.10E-04	5.85E-04
Cr-51	Ci	<LLD	6.15E-04	4.38E-03	5.00E-03
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	2.22E-04	2.22E-04
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	1.29E-04	1.29E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	4.69E-05	6.90E-04	7.37E-04
Os-191	Ci	<LLD	3.00E-06	1.06E-04	1.09E-04
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	1.80E-05	1.80E-05
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	5.37E-04	5.37E-04
Total	Ci	1.73E-06	9.56E-04	7.94E-03	8.90E-03
Total > 8 days	Ci	1.73E-06	8.97E-04	7.91E-03	8.80E-03
4. Tritium					
H-3	Ci	3.31E+02	8.86E+02	7.96E+02	2.01E+03

Table 43:
Doses To Special Locations For 2015

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NA

ENERGY INFORMATION CENTER (EIC) was relocated to an offsite location in 2011

Table 44:
Integrated Population Dose for 2015

January to March

JAN - MAR

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.91E-04
	.00%	.00%	99.91%	.00%	.00%	.00%	.00%	.00%
GROUND	9.50E-08	9.50E-08	9.50E-08	9.50E-08	9.50E-08	9.50E-08	9.50E-08	1.11E-07
	.00%	.00%	.09%	.00%	.00%	.00%	.00%	.00%
INHAL	2.13E+00	2.13E+00	0.00E+00	2.13E+00	2.13E+00	2.13E+00	2.13E+00	2.13E+00
	28.08%	28.08%	.00%	28.08%	28.08%	28.08%	28.08%	28.08%
VEGET	4.64E+00	4.64E+00	0.00E+00	4.64E+00	4.64E+00	4.64E+00	4.64E+00	4.64E+00
	61.19%	61.19%	.00%	61.19%	61.19%	61.19%	61.19%	61.19%
COW MILK	5.91E-01	5.91E-01	0.00E+00	5.91E-01	5.91E-01	5.91E-01	5.91E-01	5.91E-01
	7.79%	7.79%	.00%	7.79%	7.79%	7.79%	7.79%	7.79%
MEAT	2.23E-01	2.23E-01	0.00E+00	2.23E-01	2.23E-01	2.23E-01	2.23E-01	2.23E-01
	2.94%	2.94%	.00%	2.94%	2.94%	2.94%	2.94%	2.94%
TOTAL	7.59E+00	7.59E+00	1.03E-04	7.59E+00	7.59E+00	7.59E+00	7.59E+00	7.59E+00
(1) PER CAPITA DOSE (REM)	3.87E-06	3.87E-06	5.26E-11	3.87E-06	3.87E-06	3.87E-06	3.87E-06	3.87E-06

April through June

APR - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.12E-04	1.12E-04	1.12E-04	1.12E-04	1.12E-04	1.12E-04	1.12E-04	2.23E-04
	.00%	.00%	1.42%	.00%	.00%	.00%	.00%	.00%
GROUND	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	8.99E-03
	.16%	.16%	96.98%	.16%	.16%	.16%	.16%	.19%
INHAL	1.65E+00	1.65E+00	9.21E-05	1.65E+00	1.65E+00	1.65E+00	1.65E+00	1.65E+00
	35.03%	35.02%	1.17%	35.03%	35.03%	35.03%	35.13%	35.02%
VEGET	2.52E+00	2.52E+00	3.25E-05	2.52E+00	2.52E+00	2.52E+00	2.52E+00	2.52E+00
	53.52%	53.53%	.41%	53.52%	53.52%	53.51%	53.43%	53.50%
COW MILK	4.19E-01	4.19E-01	1.21E-06	4.19E-01	4.19E-01	4.19E-01	4.19E-01	4.19E-01
	8.91%	8.90%	.02%	8.91%	8.91%	8.91%	8.89%	8.91%
MEAT	1.12E-01	1.12E-01	8.91E-07	1.12E-01	1.12E-01	1.12E-01	1.12E-01	1.12E-01
	2.38%	2.38%	.01%	2.38%	2.38%	2.38%	2.38%	2.38%
TOTAL	4.70E+00	4.70E+00	7.88E-03	4.70E+00	4.70E+00	4.70E+00	4.71E+00	4.70E+00
(1) PER CAPITA DOSE (REM)	2.40E-06	2.40E-06	4.02E-09	2.40E-06	2.40E-06	2.40E-06	2.40E-06	2.40E-06

Table 44: (continued)
Integrated Population Dose for 2015

January through June

JAN - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.15E-04	2.15E-04	2.15E-04	2.15E-04	2.15E-04	2.15E-04	2.15E-04	4.14E-04
	.00%	.00%	2.69%	.00%	.00%	.00%	.00%	.00%
GROUND	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	8.99E-03
	.06%	.06%	95.73%	.06%	.06%	.06%	.06%	.07%
INHAL	3.78E+00	3.78E+00	9.21E-05	3.78E+00	3.78E+00	3.78E+00	3.78E+00	3.78E+00
	30.74%	30.74%	1.15%	30.74%	30.74%	30.74%	30.78%	30.73%
VEGET	7.16E+00	7.16E+00	3.25E-05	7.16E+00	7.16E+00	7.16E+00	7.16E+00	7.16E+00
	58.26%	58.26%	.41%	58.26%	58.26%	58.25%	58.22%	58.25%
COW MILK	1.01E+00	1.01E+00	1.21E-06	1.01E+00	1.01E+00	1.01E+00	1.01E+00	1.01E+00
	8.22%	8.21%	.02%	8.22%	8.22%	8.22%	8.21%	8.22%
MEAT	3.35E-01	3.35E-01	8.91E-07	3.35E-01	3.35E-01	3.35E-01	3.35E-01	3.35E-01
	2.73%	2.73%	.01%	2.73%	2.73%	2.72%	2.72%	2.72%
TOTAL	1.23E+01	1.23E+01	7.98E-03	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01
(1)								
PER CAPITA DOSE (REM)	6.28E-06	6.28E-06	4.07E-09	6.28E-06	6.28E-06	6.28E-06	6.28E-06	6.28E-06

July through September

JUL - SEP

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	7.28E-05	7.28E-05	7.28E-05	7.28E-05	7.28E-05	7.28E-05	7.28E-05	1.38E-04
	.00%	.00%	99.91%	.00%	.00%	.00%	.00%	.01%
GROUND	6.56E-08	6.56E-08	6.56E-08	6.56E-08	6.56E-08	6.56E-08	6.56E-08	7.69E-08
	.00%	.00%	.09%	.00%	.00%	.00%	.00%	.00%
INHAL	5.96E-01	5.96E-01	0.00E+00	5.96E-01	5.96E-01	5.96E-01	5.96E-01	5.96E-01
	38.60%	38.60%	.00%	38.60%	38.60%	38.60%	38.60%	38.60%
VEGET	7.58E-01	7.58E-01	0.00E+00	7.58E-01	7.58E-01	7.58E-01	7.58E-01	7.58E-01
	49.06%	49.06%	.00%	49.06%	49.06%	49.06%	49.06%	49.05%
COW MILK	1.60E-01	1.60E-01	0.00E+00	1.60E-01	1.60E-01	1.60E-01	1.60E-01	1.60E-01
	10.35%	10.35%	.00%	10.35%	10.35%	10.35%	10.35%	10.35%
MEAT	3.06E-02	3.06E-02	0.00E+00	3.06E-02	3.06E-02	3.06E-02	3.06E-02	3.06E-02
	1.98%	1.98%	.00%	1.98%	1.98%	1.98%	1.98%	1.98%
TOTAL	1.54E+00	1.54E+00	7.29E-05	1.54E+00	1.54E+00	1.54E+00	1.54E+00	1.54E+00
(1)								
PER CAPITA DOSE (REM)	7.86E-07	7.86E-07	3.72E-11	7.86E-07	7.86E-07	7.86E-07	7.86E-07	7.86E-07

Table 44: (continued)
Integrated Population Dose for 2015

October through December

OCT - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	9.51E-04	9.51E-04	9.51E-04	9.51E-04	9.51E-04	9.51E-04	9.51E-04	3.12E-03
	.01%	.01%	59.75%	.01%	.01%	.01%	.01%	.04%
GROUND	6.37E-04	6.37E-04	6.37E-04	6.37E-04	6.37E-04	6.37E-04	6.37E-04	7.50E-04
	.01%	.01%	40.03%	.01%	.01%	.01%	.01%	.01%
INHAL	2.49E+00	2.49E+00	1.85E-06	2.49E+00	2.49E+00	2.49E+00	2.49E+00	2.49E+00
	28.42%	28.42%	.12%	28.42%	28.42%	28.43%	28.43%	28.42%
VEGET	5.40E+00	5.40E+00	1.53E-06	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00
	61.72%	61.72%	.10%	61.72%	61.72%	61.71%	61.71%	61.70%
COW MILK	6.05E-01	6.05E-01	1.74E-07	6.05E-01	6.05E-01	6.06E-01	6.05E-01	6.05E-01
	6.92%	6.92%	.01%	6.92%	6.92%	6.92%	6.92%	6.92%
MEAT	2.55E-01	2.55E-01	4.34E-10	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01
	2.92%	2.92%	.00%	2.92%	2.92%	2.92%	2.92%	2.92%
TOTAL	8.74E+00	8.74E+00	1.59E-03	8.74E+00	8.74E+00	8.75E+00	8.75E+00	8.75E+00
(1)								
PER CAPITA DOSE (REM)	4.46E-06	4.46E-06	8.12E-10	4.46E-06	4.46E-06	4.47E-06	4.47E-06	4.47E-06

July through December

JUL - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	3.25E-03
	.01%	.01%	61.51%	.01%	.01%	.01%	.01%	.03%
GROUND	6.37E-04	6.37E-04	6.37E-04	6.37E-04	6.37E-04	6.37E-04	6.37E-04	7.50E-04
	.01%	.01%	38.28%	.01%	.01%	.01%	.01%	.01%
INHAL	3.08E+00	3.08E+00	1.85E-06	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00
	29.95%	29.95%	.11%	29.95%	29.95%	29.96%	29.96%	29.95%
VEGET	6.15E+00	6.15E+00	1.53E-06	6.15E+00	6.15E+00	6.16E+00	6.15E+00	6.15E+00
	59.82%	59.82%	.09%	59.82%	59.82%	59.81%	59.81%	59.80%
COW MILK	7.65E-01	7.65E-01	1.74E-07	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01
	7.44%	7.44%	.01%	7.44%	7.44%	7.44%	7.44%	7.44%
MEAT	2.86E-01	2.86E-01	4.34E-10	2.86E-01	2.86E-01	2.86E-01	2.86E-01	2.86E-01
	2.78%	2.78%	.00%	2.78%	2.78%	2.78%	2.78%	2.78%
TOTAL	1.03E+01	1.03E+01	1.67E-03	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01
(1)								
PER CAPITA DOSE (REM)	5.26E-06	5.26E-06	8.52E-10	5.26E-06	5.26E-06	5.26E-06	5.26E-06	5.26E-06

Table 44: (continued)
Integrated Population Dose for 2015

January through December

JAN - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.24E-03	1.24E-03	1.24E-03	1.24E-03	1.24E-03	1.24E-03	1.24E-03	3.67E-03
	.01%	.01%	12.84%	.01%	.01%	.01%	.01%	.02%
GROUND	8.28E-03	8.28E-03	8.28E-03	8.28E-03	8.28E-03	8.28E-03	8.28E-03	9.74E-03
	.04%	.04%	85.81%	.04%	.04%	.04%	.04%	.04%
INHAL	6.86E+00	6.86E+00	9.40E-05	6.86E+00	6.86E+00	6.86E+00	6.87E+00	6.86E+00
	30.38%	30.38%	.97%	30.38%	30.38%	30.38%	30.41%	30.37%
VEGET	1.33E+01	1.33E+01	3.41E-05	1.33E+01	1.33E+01	1.33E+01	1.33E+01	1.33E+01
	58.97%	58.97%	.35%	58.97%	58.97%	58.97%	58.95%	58.96%
COW MILK	1.77E+00	1.77E+00	1.39E-06	1.77E+00	1.77E+00	1.78E+00	1.77E+00	1.77E+00
	7.86%	7.86%	.01%	7.86%	7.86%	7.86%	7.86%	7.86%
MEAT	6.20E-01	6.21E-01	8.92E-07	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01
	2.75%	2.75%	.01%	2.75%	2.75%	2.75%	2.75%	2.75%
TOTAL	2.26E+01	2.26E+01	9.65E-03	2.26E+01	2.26E+01	2.26E+01	2.26E+01	2.26E+01
(1)								
PER CAPITA DOSE (REM)	1.15E-05	1.15E-05	4.93E-09	1.15E-05	1.15E-05	1.15E-05	1.15E-05	1.15E-05

Table 45:
Summary of Individual Doses for 2015
Radiation Doses At And Beyond The Site Boundary

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	4.87E-04	1.59E-04	1.28E-04	5.39E-04	1.25E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	9.74E-03	3.18E-03	2.56E-03	1.08E-02	1.25E-02
Beta Air Dose	mrad	1.75E-04	5.94E-05	4.64E-05	6.70E-04	9.29E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	1.75E-03	5.94E-04	4.64E-04	6.70E-03	4.64E-03
Maximum Individual						
Total Body	mrem	3.24E-04	1.05E-04	8.50E-05	3.44E-04	8.16E-04
Skin	mrem	5.20E-04	1.70E-04	1.37E-04	6.80E-04	1.44E-03
Location						
Unit 1	miles	1.27 SE	0.66 NNE	1.40 SSW	1.70 SSE	1.70 SSE
Unit 2	miles	1.31 SE	0.83 NNE	1.14 SSW	1.88 SSE	1.88 SSE
Unit 3	miles	1.40 SE	1.05 NNE	1.00 SSW	1.73 SSE	1.73 SSE
Maximum Organ Dose(1) From All Radionuclides						
	Age	Infant	Child	Child	Child	Child
	Organ	Bone	Bone	Bone	Bone	Bone
	mrem	2.41E+00	2.00E+00	1.36E+00	1.95E+00	6.46E+00
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	3.21E+01	2.67E+01	1.81E+01	2.60E+01	4.31E+01
Location						
Unit 1	miles	3.99 SE	1.93 NE	1.93 NE	1.93 NE	1.93 NE
Unit 2	miles	3.99 SE	2.16 NE	2.16 NE	2.16 NE	2.16 NE
Unit 3	miles	3.93 SE	2.36 NE	2.36 NE	2.36 NE	2.36 NE
Maximum Organ Dose(1) From All Radionuclides Excluding C-14						
	Age	Infant	Child	Child	Infant	Infant
	Organ	Thyroid (2)	GI-Tract	Thyroid (2)	Thyroid (2)	Thyroid (2)
	mrem	3.00E-01	2.06E-01	5.44E-02	2.36E-01	6.35E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	4.00E+00	2.75E+00	7.25E-01	3.15E+00	4.23E+00
Unit 1	miles	3.99 SE	1.93 NE	1.93 NE	3.99 SE	3.99 SE
Unit 2	miles	3.99 SE	2.16 NE	2.16 NE	3.99 SE	3.99 SE
Unit 3	miles	3.93 SE	2.36 NE	2.36 NE	3.93 SE	3.93 SE
Organ Dose from tritium only for Unit 2 location above	mrem	2.53E-02	2.04E-01	5.43E-02	2.84E-02	7.84E-02
Fraction of organ dose from tritum only for Unit 2 location above	%	8.43	99.03	99.82	12.03	12.35
X/Q for Unit 2 location above	sec/m3	2.29E-06	1.77E-06	1.20E-06	1.65E-06	1.25E-06
D/Q for Unit 2 location above	m-2	6.23E-10	5.84E-09	5.07E-09	4.67E-10	3.99E-10

(1) Excluding skin
(2) 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

2016 ARERR Errata

The following permits had the tritium activity removed from the report because the reported tritium activity was the result of interference from a BAC release, which is accounted for on the boric acid concentrator batch permit: 20161073, 20161080, 20161083, 20161087, 20162118, 20163123, 20163128, 20163134, 20163139, and 20163147.

The following permits had the tritium removed from the report because the reported activity was the result of refueling activities and the tritium activity was already accounted for on Refueling Purge batch permits: 20161059, 20161065, and 20161068.

The tritium activity on Permit 20162119 was adjusted in the report to account for the small steam leak (1 to 1.5 inch steam plume) from a stream trap. The assumptions used to develop the release rate were considered overly conservative; therefore, the vapor release rate was changed from 6.16E+03 lbm/hr to 50 lbm/hr to more accurately model the release.

Permits having a release duration greater than 216 hours were accounted for as a continuous release.

Table 1: Evaporation Pond Data was revised to correct an error when calculating the Average Tritium Concentration.

Site Boundary inhalation doses were calculated with unit specific X/Q and the entire estimated C-14 released.

The following pages contain the corrections to the 2016 ARERR.

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: NCRPReport No. 160, Table 1.1.

The PVNGS calculated production of carbon-14 is 18.5 Curies per operating cycle (500 days) or 13.5 curies per year. The 13.5 curies will be divided equally between each quarter (3.38 curies per reactor). The estimated C-14 activity is included in all of the inhalation and ingestion dose calculations

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 Dose Summary

Dose for 2016 was primarily due to the release of tritium. Tritium production is estimated to be 1000 curies per Reactor Unit per year. In order to control plant tritium concentrations, tritium releases should match tritium production. For 2016, PVNGS released a total of 2260 curies of tritium (see Table 39).

Table 1: Evaporation Pond Data					
Evaporation Pond 1(1A, 1B, 1C)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	3.22E+11	8.85E+11	8.85E+11	3.22E+11	
Tritium Concentration (uCi/cc)	1.06E-06	1.27E-06	8.81E-07	8.81E-07	
Tritium Curies	342E-01	1.13E+00	7.80E-01	2.84E-01	2.53E+00
Evaporation Pond 2 (2A and 2B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.52E+11	6.92E+11	6.92E+11	2.52E+11	
Tritium Concentration (uCi/cc)	6.93E-07	6.71E-07	8.76E-07	1.47E-06	
Tritium curies	1.74E-01	4.64E-01	6.06E-01	3.69E-01	1.61E+00
Evaporation Pond 3 (3A and 3B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.20E+11	6.04E+11	6.04E+11	2.20E+11	
Tritium Concentration (uCi/cc)	7.42E-07	7.53E-07	1.44E-06	1.13E-06	
Tritium curies	1.63E-01	4.55E-01	8.69E-01	2.49E-01	1.74E+00
Dose (mRem)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Pond 1	4.75E-03	1.56E-02	1.08E-03	3.93E-03	3.51E-02
Pond 2	2.42E-03	6.44E-03	8.41E-03	5.12E-03	2.24E-02
Pond 3	2.26E-03	6.31E-03	1.20E-02	3.45E-03	2.41E-02
Total	9.43E-03	2.84E-02	3.13E-02	1.25E-02	8.16E-02

Table 2: Batch Release Data			
All times are in hours	Unit 1	Unit 2	Unit 3
January - June			
Number of batch releases	44	20	16
Total time period for batch releases	1901.21	58.82	76.17
Maximum time period for a batch release	168.00	35.27	53.70
Average time period for a batch release	43.21	2.94	4.76
Minimum time period for a batch release	0.10	0.31	0.60
July - December			
Number of batch releases	23	24	47
Total time period for batch releases	322.13	140.15	1908.40
Maximum time period for a batch release	100.85	53.50	168.00
Average time period for a batch release	14.01	5.84	40.60
Minimum time period for a batch release	0.57	0.57	0.02
January - December			
Number of batch releases	67	44	63
Total time period for batch releases	2223.34	198.97	1984.57
Maximum time period for a batch release	168.00	53.50	168.00
Average time period for a batch release	33.18	4.52	31.50
Minimum time period for a batch release	0.10	0.31	0.02

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	1.14E-01	4.67E-01	6.17E-02	5.42E-02	6.97E-01	3.54E+01
2. Average release rate for period	µCi/sec	1.45E-02	5.94E-02	7.76E-03	6.82E-03	2.20E-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	< LLD	1.72E-05	< LLD	< LLD	1.72E-05	3.32E+01
2. Average release rate for period	µCi/sec	< LLD	2.18E-06	< LLD	< LLD	5.43E-07	
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	1.33E-06	8.47E-03	1.52E-06	< LLD	8.47E-03	3.43E+01
2. Average release rate for period	µCi/sec	1.70E-07	1.08E-03	1.91E-07	< LLD	2.68E-04	
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	4.95E+02	3.41E+02	1.08E+02	1.03E+02	1.05E+03	3.85E+01
2. Average release rate for period	µCi/sec	6.29E+01	4.34E+01	1.36E+01	1.30E+01	3.31E+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 11 for percent of ODCM Requirement limits.							

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	4.88E-06	< LLD	< LLD	4.88E-06
Co-58	Ci	< LLD	1.59E-03	1.52E-06	< LLD	1.59E-03
Co-60	Ci	1.33E-06	5.21E-04	< LLD	< LLD	5.22E-04
Cr-51	Ci	< LLD	5.72E-03	< LLD	< LLD	5.72E-03
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	9.54E-05	< LLD	< LLD	9.54E-05
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	1.31E-04	< LLD	< LLD	1.31E-04
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	1.98E-04	< LLD	< LLD	1.98E-04
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	7.86E-05	< LLD	< LLD	7.86E-05
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	< LLD	< LLD	< LLD	< LLD	< LLD
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	1.32E-04	< LLD	< LLD	1.32E-04
Total	Ci	1.33E-06	8.47E-03	1.52E-06	< LLD	8.47E-03
4.Tritium						
H-3	Ci	2.58E+01	2.95E+01	3.86E+01	2.28E+01	1.17E+02

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	1.53E-05	<LLD	<LLD	1.53E-05
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	4.01E-04	<LLD	<LLD	4.01E-04
Co-60	Ci	<LLD	1.52E-04	<LLD	<LLD	1.52E-04
Cr-51	Ci	<LLD	1.15E-03	<LLD	<LLD	1.15E-03
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	8.86E-06	<LLD	<LLD	8.86E-06
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	3.44E-05	<LLD	<LLD	3.44E-05
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	5.04E-05	<LLD	<LLD	5.04E-05
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	5.29E-06	<LLD	<LLD	5.29E-06
Total	Ci	<LLD	1.81E-03	<LLD	<LLD	1.81E-03
4.Tritium						
H-3	Ci	4.69E+02	3.11E+02	6.96E+01	8.06E+01	9.31E+02
Note 1 - Not required for batch releases						

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	2.51E-04	5.45E-04	1.35E-04	1.19E-04	1.05E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	5.01E-03	1.09E-02	2.71E-03	2.39E-03	1.05E-02
Beta Air Dose	mrad	8.85E-05	2.64E-04	4.78E-05	4.21E-05	4.43E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	8.85E-04	2.64E-03	4.78E-04	4.21E-04	2.21E-03
Maximum Organ Dose (excluding skin)	mrem	1.53E-01	1.09E-01	3.65E-02	3.51E-02	3.34E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Lung	Lung	Lung	T. Body	Lung
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	2.04E+00	1.46E+00	4.87E-01	4.68E-01	2.23E+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	8.56E-02	7.08E-02	9.60E-02	8.95E-02	3.42E-01	3.54E+01
2. Average release rate for period	µCi/sec	1.09E-02	9.01E-03	1.21E-02	1.13E-02	1.08E-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	< LLD	< LLD	< LLD	< LLD	< LLD	3.32E+01
2. Average release rate for period	µCi/sec	< LLD	< LLD	< LLD	< LLD	< LLD	
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	< LLD	< LLD	< LLD	< LLD	< LLD	3.43E+01
2. Average release rate for period	µCi/sec	< LLD	< LLD	< LLD	< LLD	< LLD	
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	4.52E+01	2.93E+01	7.81E+01	9.52E+01	2.48E+02	3.85E+01
2. Average release rate for period	µCi/sec	5.74E+00	3.73E+00	9.83E+01	1.20E+01	7.84E+00	
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 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	< 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	< LLD	< LLD	< LLD	< LLD	< LLD
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	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
4. Tritium						
H-3	Ci	3.01E+01	2.93E+01	2.12E+01	1.83E+01	9.89E+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	7.12E-02	5.87E-02	7.50E-02	7.21E-02	2.77E-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	1.43E-02	1.21E-02	2.09E-02	1.74E-02	6.47E-02
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	1.33E-04	5.78E-05	1.91E-04
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	8.56E-02	7.08E-02	9.60E-02	8.95E-02	3.42E-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 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	< 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	1.50E+01	2.42E-02	5.69E+01	7.69E+01	1.49E+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	7.12E-02	5.87E-02	7.50E-02	7.21E-02	2.77E-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	1.43E-02	1.21E-02	2.09E-02	1.74E-02	6.47E-02
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	1.33E-04	5.78E-05	1.91E-04
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	8.56E-02	7.08E-02	9.60E-02	8.95E-02	3.42E-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 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	< 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	< LLD	< LLD	< LLD	< LLD	< LLD
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	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total > 8 days	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
4. Tritium						
H-3	Ci	4.52E+01	2.93E+01	7.81E+01	9.52E+01	2.48E+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	1.67E-04	1.38E-04	1.76E-04	1.69E-04	6.51E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	3.34E-03	2.76E-03	3.53E-03	3.39E-03	6.51E-03
Beta Air Dose	mrad	6.38E-05	5.27E-05	6.93E-05	6.57E-05	2.52E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	6.38E-04	5.27E-04	6.93E-04	6.57E-04	1.26E-03
Maximum Organ Dose (excluding skin)	mrem	3.04E-02	3.04E-02	3.04E-02	3.45E-02	1.22E-01
Age		Child	Child	Child	Teen	Child
Organ		Bone	Bone	Bone	T. Body	Bone
ODCM Req. 4.2 Limit	%	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	4.05E-01	4.05E-01	4.05E-01	4.60E-01	8.10E-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.

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	4.38E-02	4.81E-02	8.04E-02	1.03E-01	2.76E-01	3.54E+01
2. Average release rate for period	µCi/sec	5.57E-03	6.12E-03	1.01E-02	1.30E-02	8.72E-03	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
B. Iodine 131							
1. Total Iodine 131	Ci	< LLD	< LLD	< LLD	2.35E-05	2.35E-05	3.32E+01
2. Average release rate for period	µCi/sec	< LLD	< LLD	< LLD	2.96E-06	7.43E-07	
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	<LLD	<LLD	<LLD	1.40E-04	1.40E-04	3.43E+01
2. Average release rate for period	µCi/sec	<LLD	<LLD	<LLD	1.76E-05	4.41E-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	6.92E+01	2.73E+01	5.81E+02	2.88E+02	9.66E+02	3.85E+01
2. Average release rate for period	µCi/sec	8.80E+00	3.48E+00	7.31E+01	3.62E+01	3.05E+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 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	< LLD	< LLD	< LLD	2.19E-05	2.19E-05
Co-60	Ci	< LLD	< LLD	< LLD	7.52E-06	7.52E-06
Cr-51	Ci	< LLD	< LLD	< LLD	4.49E-06	4.49E-06
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	1.38E-06	1.38E-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	< LLD	< LLD	< LLD	< LLD	< LLD
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	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	3.53E-05	3.53E-05
4. Tritium						
H-3	Ci	2.92E+01	2.73E+01	2.43E+01	2.57E+01	1.06E+02

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	3.07E-06	3.07E-06
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	3.33E-05	3.33E-05
Co-60	Ci	<LLD	<LLD	<LLD	2.27E-05	2.27E-05
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	1.34E-07	1.34E-07
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	2.72E-05	2.72E-05
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	2.09E-05	2.09E-05
Total	Ci	<LLD	<LLD	<LLD	1.07E-04	1.07E-04
4. Tritium						
H-3	Ci	4.00E+01	2.48E-02	5.57E+02	2.62E+02	8.59E+02
Note 1 - Not required for batch releases						

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	3.07E-06	3.07E-06
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	5.52E-05	5.52E-05
Co-60	Ci	<LLD	<LLD	<LLD	3.02E-05	3.02E-05
Cr-51	Ci	<LLD	<LLD	<LLD	4.49E-06	4.49E-06
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	1.34E-07	1.34E-07
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	2.72E-05	2.72E-05
Os-191	Ci	<LLD	<LLD	<LLD	1.38E-06	1.38E-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	<LLD	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	2.09E-05	2.09E-05
Total	Ci	<LLD	<LLD	<LLD	1.43E-04	1.43E-04
Total > 8 days	Ci	<LLD	<LLD	<LLD	1.40E-04	1.40E-04
4. Tritium						
H-3	Ci	6.92E+01	2.73E+01	5.81E+02	2.88E+02	9.66E+03

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	1.15E-04	1.26E-04	2.11E-04	1.39E-04	5.91E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.30E-03	2.53E-03	4.22E-03	2.78E-03	5.91E-03
Beta Air Dose	mrad	4.06E-05	4.46E-05	7.45E-05	6.91E-05	2.29E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	4.06E-04	4.46E-04	7.45E-04	6.91E-04	1.14E-03
Maximum Organ Dose (excluding skin)	mrem	3.43E-02	3.43E-02	2.14E-01	1.08E-01	3.66E-01
Age		Child	Child	Teen	Teen	Teen
Organ		Bone	Bone	T. Body	Lung	Lung
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	4.57E-01	4.57E-01	2.85E+00	1.45E+00	2.44E+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 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	4.88E-06	<LLD	<LLD	4.88E-06
Co-58	Ci	<LLD	1.59E-03	1.52E-06	2.19E-05	1.62E-03
Co-60	Ci	1.33E-06	5.21E-04	<LLD	7.52E-06	5.29E-04
Cr-51	Ci	<LLD	5.72E-03	<LLD	4.49E-06	5.72E-03
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	9.54E-05	<LLD	<LLD	9.54E-05
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	1.31E-04	<LLD	<LLD	1.31E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	1.98E-04	<LLD	<LLD	1.98E-04
Os-191	Ci	<LLD	<LLD	<LLD	1.38E-06	1.38E-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	7.86E-05	<LLD	<LLD	7.86E-05
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	<LLD	<LLD	<LLD	<LLD	<LLD
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	1.32E-04	<LLD	<LLD	1.32E-04
Total	Ci	1.33E-06	8.47E-03	1.52E-06	3.53E-05	8.51E-03
4. Tritium						
H-3	Ci	8.51E+01	8.61E+01	8.41E+01	6.68E+01	3.22E+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	2.29E-01	3.45E-01	2.17E-01	1.77E-01	9.68E-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	1.24E-03	< LLD	< LLD	1.24E-03
Xe-133	Ci	1.47E-02	1.73E-01	2.11E-02	6.97E-02	2.79E-01
Xe-133m	Ci	< LLD	1.02E-03	< LLD	< LLD	1.02E-03
Xe-135	Ci	< LLD	3.33E-03	1.33E-04	5.78E-05	3.52E-03
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	2.44E-01	5.24E-01	2.38E-01	2.47E-01	1.25E+00
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 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	1.53E-05	<LLD	3.07E-06	1.84E-05
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	4.01E-04	<LLD	3.33E-05	4.34E-04
Co-60	Ci	<LLD	1.52E-04	<LLD	2.27E-05	1.75E-04
Cr-51	Ci	<LLD	1.15E-03	<LLD	<LLD	1.15E-03
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	8.86E-06	<LLD	<LLD	8.86E-06
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	3.44E-05	<LLD	1.34E-07	3.46E-05
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	5.04E-05	<LLD	2.72E-05	7.76E-05
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	5.29E-06	<LLD	2.09E-05	2.62E-05
Total	Ci	<LLD	1.81E-03	<LLD	1.07E-04	1.92E-03
4. Tritium						
H-3	Ci	5.24E+02	3.11E+02	6.84E+02	4.20E+02	1.94E+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	2.29E-01	3.45E-01	2.17E-01	1.77E-01	9.68E-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	1.24E-03	< LLD	< LLD	1.24E-03
Xe-133	Ci	1.47E-02	2.35E-01	2.11E-02	6.97E-02	3.41E-01
Xe-133m	Ci	< LLD	1.02E-03	< LLD	< LLD	1.02E-03
Xe-135	Ci	< LLD	3.33E-03	1.33E-04	5.78E-05	3.52E-03
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	2.44E-01	5.86E-01	2.38E-01	2.47E-01	1.31E+00
2. Iodines						
I-131	Ci	< LLD	1.72E-05	< LLD	2.35E-05	4.07E-05
I-132	Ci	< LLD	2.73E-04	< LLD	< LLD	2.73E-04
I-133	Ci	< LLD	< LLD	< LLD	9.27E-06	9.27E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	2.90E-04	< LLD	3.28E-05	3.23E-04

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	1.53E-05	<LLD	3.07E-06	1.84E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	4.88E-06	<LLD	<LLD	4.88E-06
Co-58	Ci	<LLD	1.99E-03	1.52E-06	5.52E-05	2.05E-03
Co-60	Ci	1.33E-06	6.73E-04	<LLD	3.02E-05	7.04E-04
Cr-51	Ci	<LLD	6.86E-03	<LLD	4.49E-06	6.87E-03
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	1.04E-04	<LLD	<LLD	1.04E-04
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	1.65E-04	<LLD	1.34E-07	1.65E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	2.48E-04	<LLD	2.72E-05	2.75E-04
Os-191	Ci	<LLD	<LLD	<LLD	1.38E-06	1.38E-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	7.86E-05	<LLD	<LLD	7.86E-05
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	<LLD	<LLD	<LLD	<LLD	<LLD
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	1.37E-04	<LLD	2.09E-05	1.58E-04
Total	Ci	1.33E-06	1.03E-02	1.52E-06	1.43E-04	1.04E-02
Total > 8 days	Ci	1.33E-06	1.03E-02	1.52E-06	1.40E-04	1.04E-02
4. Tritium						
H-3	Ci	6.09E+02	3.98E+02	7.68E+02	4.87E+02	2.26E+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	4.88E-06	<LLD	<LLD	4.88E-06
Co-58	Ci	1.59E-03	<LLD	2.19E-05	1.62E-03
Co-60	Ci	5.22E-04	<LLD	7.52E-06	5.29E-04
Cr-51	Ci	5.72E-03	<LLD	4.49E-06	5.72E-03
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	9.54E-05	<LLD	<LLD	9.54E-05
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	1.31E-04	<LLD	<LLD	1.31E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	1.98E-04	<LLD	<LLD	1.98E-04
Os-191	Ci	<LLD	<LLD	1.38E-06	1.38E-06
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
Ru-103	Ci	<LLD	<LLD	<LLD	<LLD
Ru-106	Ci	<LLD	<LLD	<LLD	<LLD
Sb-122	Ci	<LLD	<LLD	<LLD	<LLD
Sb-124	Ci	7.86E-05	<LLD	<LLD	7.86E-05
Sb-125	Ci	<LLD	<LLD	<LLD	<LLD
Se-75	Ci	<LLD	<LLD	<LLD	<LLD
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	1.32E-04	<LLD	<LLD	1.32E-04
Total	Ci	8.47E-03	<LLD	3.53E-05	8.51E-03
4. Tritium					
H-3	Ci	1.17E+02	9.89E+01	1.06E+02	3.22E+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	4.68E-01	2.77E-01	2.23E-01	9.68E+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	1.24E-03	< LLD	< LLD	1.24E-03
Xe-133	Ci	1.62E-01	6.47E-02	5.23E-02	2.79E-01
Xe-133m	Ci	1.02E-03	< LLD	< LLD	1.02E-03
Xe-135	Ci	3.33E-03	1.90E-04	< LLD	3.52E-03
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.35E-01	3.42E-01	2.76E-01	1.25E+00
2. Iodines					
I-131	Ci	< LLD	< LLD	< LLD	< LLD
I-132	Ci	< LLD	< LLD	< LLD	< LLD
I-133	Ci	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	< LLD

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	1.53E-05	<LLD	3.07E-06	1.84E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	4.01E-04	<LLD	3.33E-05	4.34E-04
Co-60	Ci	1.52E-04	<LLD	2.27E-05	1.75E-04
Cr-51	Ci	1.15E-03	<LLD	<LLD	1.15E-03
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	8.86E-06	<LLD	<LLD	8.86E-06
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	3.44E-05	<LLD	1.34E-07	3.46E-05
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	5.04E-05	<LLD	2.72E-05	7.76E-05
Os-191	Ci	<LLD	<LLD	<LLD	<LLD
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
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	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	5.29E-06	<LLD	2.09E-05	2.62E-05
Total	Ci	1.81E-03	<LLD	1.07E-04	1.92E-03
4. Tritium					
H-3	Ci	9.31E+02	1.49E+02	8.59E+02	1.94E+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	4.68E-01	2.77E-01	2.23E-01	9.68E-01
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	1.24E-03	< LLD	< LLD	1.24E-03
Xe-133	Ci	2.24E-01	6.47E-02	5.23E-02	3.41E-01
Xe-133m	Ci	1.02E-03	< LLD	< LLD	1.02E-03
Xe-135	Ci	3.33E-03	1.90E-04	< LLD	3.52E-03
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.97E-01	3.42E-01	2.76E-01	1.31E+00
2. Iodines					
I-131	Ci	1.72E-05	< LLD	2.35E-05	4.07E-05
I-132	Ci	2.73E-04	< LLD	< LLD	2.73E-04
I-133	Ci	< LLD	< LLD	9.27E-06	9.27E-06
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
Total	Ci	2.90E-04	< LLD	3.28E-05	3.23E-04

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	1.53E-05	<LLD	3.07E-06	1.84E-05
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	4.88E-06	<LLD	<LLD	4.88E-06
Co-58	Ci	1.99E-03	<LLD	5.52E-05	2.05E-03
Co-60	Ci	6.74E-04	<LLD	3.02E-05	7.04E-04
Cr-51	Ci	6.86E-03	<LLD	4.49E-06	6.87E-03
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Cs-138	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	1.04E-04	<LLD	<LLD	1.04E-04
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	1.65E-04	<LLD	1.34E-07	1.65E-04
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	2.48E-04	<LLD	2.72E-05	2.75E-04
Os-191	Ci	<LLD	<LLD	1.38E-06	1.38E-06
Rb-88	Ci	<LLD	<LLD	<LLD	<LLD
Ru-103	Ci	<LLD	<LLD	<LLD	<LLD
Ru-106	Ci	<LLD	<LLD	<LLD	<LLD
Sb-122	Ci	<LLD	<LLD	<LLD	<LLD
Sb-124	Ci	7.86E-05	<LLD	<LLD	7.86E-05
Sb-125	Ci	<LLD	<LLD	<LLD	<LLD
Se-75	Ci	<LLD	<LLD	<LLD	<LLD
Sn-113m	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	1.37E-04	<LLD	2.09E-05	1.58E-04
Total	Ci	1.03E-02	<LLD	1.43E-04	1.04E-02
Total > 8 days	Ci	1.03E-02	<LLD	1.40E-04	1.04E-02
4. Tritium					
H-3	Ci	1.05E+03	2.48E+02	9.66E+02	2.26E+03

Table 43:
Doses To Special Locations For 2016

NA:
ENERGY INFORMATION CENTER (EIC) was relocated to an offsite location in 2011.

Table 44:
Integrated Population Dose for 2016

January to March

JAN - MAR

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.20E-04	1.20E-04	1.20E-04	1.20E-04	1.20E-04	1.20E-04	1.20E-04	2.23E-04
	.00%	.00%	90.84%	.00%	.00%	.00%	.00%	.00%
GROUND	1.21E-05	1.21E-05	1.21E-05	1.21E-05	1.21E-05	1.21E-05	1.21E-05	1.42E-05
	.00%	.00%	9.16%	.00%	.00%	.00%	.00%	.00%
INHAL	2.15E+00	2.15E+00	0.00E+00	2.15E+00	2.15E+00	2.15E+00	2.15E+00	2.15E+00
	25.83%	25.83%	.00%	25.83%	25.83%	25.83%	25.83%	25.83%
VEGET	5.33E+00	5.33E+00	0.00E+00	5.33E+00	5.33E+00	5.33E+00	5.33E+00	5.33E+00
	64.04%	64.04%	.00%	64.04%	64.04%	64.04%	64.04%	64.04%
COW MILK	5.79E-01	5.79E-01	0.00E+00	5.79E-01	5.79E-01	5.79E-01	5.79E-01	5.79E-01
	6.96%	6.96%	.00%	6.96%	6.96%	6.96%	6.96%	6.96%
MEAT	2.64E-01	2.64E-01	0.00E+00	2.64E-01	2.64E-01	2.64E-01	2.64E-01	2.64E-01
	3.17%	3.17%	.00%	3.17%	3.17%	3.17%	3.17%	3.17%
TOTAL	8.33E+00	8.33E+00	1.32E-04	8.33E+00	8.33E+00	8.33E+00	8.33E+00	8.33E+00
(1)								
PER CAPITA DOSE (REM)	4.25E-06	4.25E-06	6.74E-11	4.25E-06	4.25E-06	4.25E-06	4.25E-06	4.25E-06

April through June

APR - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.91E-04	1.91E-04	1.91E-04	1.91E-04	1.91E-04	1.91E-04	1.91E-04	4.31E-04
	.01%	.01%	2.54%	.01%	.01%	.01%	.01%	.02%
GROUND	7.29E-03	7.29E-03	7.29E-03	7.29E-03	7.29E-03	7.29E-03	7.29E-03	8.57E-03
	.27%	.27%	96.89%	.27%	.27%	.27%	.27%	.32%
INHAL	8.09E-01	8.10E-01	2.14E-05	8.09E-01	8.09E-01	8.10E-01	8.15E-01	8.09E-01
	29.90%	29.89%	.28%	29.90%	29.90%	29.90%	30.05%	29.88%
VEGET	1.63E+00	1.63E+00	2.11E-05	1.63E+00	1.63E+00	1.63E+00	1.63E+00	1.63E+00
	60.04%	60.05%	.28%	60.04%	60.04%	60.03%	59.90%	60.00%
COW MILK	2.05E-01	2.05E-01	5.34E-07	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01
	7.56%	7.56%	.01%	7.56%	7.56%	7.56%	7.54%	7.56%
MEAT	6.03E-02	6.04E-02	3.47E-07	6.03E-02	6.03E-02	6.03E-02	6.03E-02	6.03E-02
	2.23%	2.23%	.00%	2.23%	2.23%	2.23%	2.22%	2.23%
TOTAL	2.71E+00	2.71E+00	7.52E-03	2.71E+00	2.71E+00	2.71E+00	2.71E+00	2.71E+00
(1)								
PER CAPITA DOSE (REM)	1.38E-06	1.38E-06	3.84E-09	1.38E-06	1.38E-06	1.38E-06	1.38E-06	1.38E-06

Table 44: (continued) Integrated Population Dose for 2016

January through June

JAN - JUN

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	3.11E-04	3.11E-04	3.11E-04	3.11E-04	3.11E-04	3.11E-04	3.11E-04	6.54E-04
	.00%	.00%	4.06%	.00%	.00%	.00%	.00%	.01%
GROUND	7.30E-03	7.30E-03	7.30E-03	7.30E-03	7.30E-03	7.30E-03	7.30E-03	8.59E-03
	.07%	.07%	95.37%	.07%	.07%	.07%	.07%	.08%
INHAL	2.96E+00	2.96E+00	2.14E-05	2.96E+00	2.96E+00	2.96E+00	2.97E+00	2.96E+00
	26.83%	26.83%	.28%	26.83%	26.83%	26.83%	26.87%	26.83%
VEGET	6.96E+00	6.96E+00	2.11E-05	6.96E+00	6.96E+00	6.96E+00	6.96E+00	6.96E+00
	63.06%	63.06%	.28%	63.06%	63.06%	63.06%	63.02%	63.05%
COW MILK	7.84E-01	7.84E-01	5.34E-07	7.84E-01	7.84E-01	7.84E-01	7.84E-01	7.84E-01
	7.10%	7.10%	.01%	7.10%	7.10%	7.10%	7.10%	7.10%
MEAT	3.25E-01	3.25E-01	3.47E-07	3.25E-01	3.25E-01	3.25E-01	3.25E-01	3.25E-01
	2.94%	2.94%	.00%	2.94%	2.94%	2.94%	2.94%	2.94%
TOTAL	1.10E+01	1.10E+01	7.66E-03	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01
(1)								
PER CAPITA DOSE (REM)	5.62E-06	5.62E-06	3.91E-09	5.62E-06	5.62E-06	5.62E-06	5.62E-06	5.62E-06

July through September

JUL - SEP

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	6.45E-05	6.45E-05	6.45E-05	6.45E-05	6.45E-05	6.45E-05	6.45E-05	1.19E-04
	.00%	.00%	99.59%	.00%	.00%	.00%	.00%	.00%
GROUND	2.66E-07	2.66E-07	2.66E-07	2.66E-07	2.66E-07	2.66E-07	2.66E-07	3.11E-07
	.00%	.00%	.41%	.00%	.00%	.00%	.00%	.00%
INHAL	8.77E-01	8.77E-01	0.00E+00	8.77E-01	8.77E-01	8.77E-01	8.77E-01	8.77E-01
	29.86%	29.86%	.00%	29.86%	29.86%	29.86%	29.86%	29.86%
VEGET	1.77E+00	1.77E+00	0.00E+00	1.77E+00	1.77E+00	1.77E+00	1.77E+00	1.77E+00
	60.44%	60.44%	.00%	60.44%	60.44%	60.44%	60.44%	60.44%
COW MILK	2.13E-01	2.13E-01	0.00E+00	2.13E-01	2.13E-01	2.13E-01	2.13E-01	2.13E-01
	7.27%	7.27%	.00%	7.27%	7.27%	7.27%	7.27%	7.27%
MEAT	7.16E-02	7.16E-02	0.00E+00	7.16E-02	7.16E-02	7.16E-02	7.16E-02	7.16E-02
	2.44%	2.44%	.00%	2.44%	2.44%	2.44%	2.44%	2.44%
TOTAL	2.94E+00	2.94E+00	6.47E-05	2.94E+00	2.94E+00	2.94E+00	2.94E+00	2.94E+00
(1)								
PER CAPITA DOSE (REM)	1.50E-06	1.50E-06	3.30E-11	1.50E-06	1.50E-06	1.50E-06	1.50E-06	1.50E-06

Table 44: (continued)
Integrated Population Dose for 2016

October through December

OCT - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.11E-04	1.11E-04	1.11E-04	1.11E-04	1.11E-04	1.11E-04	1.11E-04	2.49E-04
	.00%	.00%	31.22%	.00%	.00%	.00%	.00%	.00%
GROUND	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.77E-04
	.00%	.00%	66.34%	.00%	.00%	.00%	.00%	.00%
INHAL	2.06E+00	2.06E+00	6.97E-06	2.06E+00	2.06E+00	2.06E+00	2.06E+00	2.06E+00
	27.37%	27.37%	1.97%	27.37%	27.37%	27.37%	27.37%	27.37%
VEGET	4.68E+00	4.68E+00	1.50E-06	4.68E+00	4.68E+00	4.68E+00	4.68E+00	4.68E+00
	62.11%	62.11%	.42%	62.11%	62.11%	62.10%	62.10%	62.11%
COW MILK	5.73E-01	5.73E-01	1.59E-07	5.73E-01	5.73E-01	5.73E-01	5.73E-01	5.73E-01
	7.61%	7.61%	.04%	7.61%	7.61%	7.61%	7.61%	7.61%
MEAT	2.20E-01	2.20E-01	2.06E-09	2.20E-01	2.20E-01	2.20E-01	2.20E-01	2.20E-01
	2.92%	2.92%	.00%	2.92%	2.92%	2.92%	2.92%	2.92%
TOTAL	7.53E+00	7.53E+00	3.54E-04	7.53E+00	7.53E+00	7.53E+00	7.53E+00	7.53E+00
(1)								
PER CAPITA DOSE (REM)	3.84E-06	3.84E-06	1.81E-10	3.84E-06	3.84E-06	3.84E-06	3.84E-06	3.84E-06

July through December

JUL - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	3.68E-04
	.00%	.00%	41.78%	.00%	.00%	.00%	.00%	.00%
GROUND	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.77E-04
	.00%	.00%	56.16%	.00%	.00%	.00%	.00%	.00%
INHAL	2.94E+00	2.94E+00	6.97E-06	2.94E+00	2.94E+00	2.94E+00	2.94E+00	2.94E+00
	28.06%	28.06%	1.66%	28.06%	28.06%	28.07%	28.07%	28.06%
VEGET	6.45E+00	6.45E+00	1.50E-06	6.45E+00	6.45E+00	6.45E+00	6.45E+00	6.45E+00
	61.64%	61.64%	.36%	61.64%	61.64%	61.64%	61.64%	61.64%
COW MILK	7.86E-01	7.86E-01	1.59E-07	7.86E-01	7.86E-01	7.86E-01	7.86E-01	7.86E-01
	7.51%	7.51%	.04%	7.51%	7.51%	7.51%	7.51%	7.51%
MEAT	2.91E-01	2.91E-01	2.06E-09	2.91E-01	2.91E-01	2.91E-01	2.91E-01	2.91E-01
	2.78%	2.78%	.00%	2.78%	2.78%	2.78%	2.78%	2.78%
TOTAL	1.05E+01	1.05E+01	4.19E-04	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01
(1)								
PER CAPITA DOSE (REM)	5.36E-06	5.36E-06	2.14E-10	5.36E-06	5.36E-06	5.36E-06	5.36E-06	5.36E-06

Table 44: (continued)
Integrated Population Dose for 2016

January through December

JAN - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	4.86E-04	4.86E-04	4.86E-04	4.86E-04	4.86E-04	4.86E-04	4.86E-04	1.02E-03
	.00%	.00%	6.02%	.00%	.00%	.00%	.00%	.00%
GROUND	7.54E-03	7.54E-03	7.54E-03	7.54E-03	7.54E-03	7.54E-03	7.54E-03	8.86E-03
	.04%	.04%	93.34%	.04%	.04%	.04%	.04%	.04%
INHAL	5.90E+00	5.90E+00	2.84E-05	5.90E+00	5.90E+00	5.90E+00	5.91E+00	5.90E+00
	27.43%	27.43%	.35%	27.43%	27.43%	27.43%	27.45%	27.43%
VEGET	1.34E+01	1.34E+01	2.26E-05	1.34E+01	1.34E+01	1.34E+01	1.34E+01	1.34E+01
	62.37%	62.37%	.28%	62.37%	62.37%	62.36%	62.35%	62.36%
COW MILK	1.57E+00	1.57E+00	6.93E-07	1.57E+00	1.57E+00	1.57E+00	1.57E+00	1.57E+00
	7.30%	7.30%	.01%	7.30%	7.30%	7.30%	7.30%	7.30%
MEAT	6.16E-01	6.16E-01	3.49E-07	6.16E-01	6.16E-01	6.16E-01	6.16E-01	6.16E-01
	2.86%	2.86%	.00%	2.86%	2.86%	2.86%	2.86%	2.86%
TOTAL	2.15E+01	2.15E+01	8.08E-03	2.15E+01	2.15E+01	2.15E+01	2.15E+01	2.15E+01
(1)								
PER CAPITA DOSE (REM)	1.10E-05	1.10E-05	4.12E-09	1.10E-05	1.10E-05	1.10E-05	1.10E-05	1.10E-05

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

Table 45: Summary of Individual Doses for 2016 Radiation Doses At And Beyond The Site Boundary						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	5.07E-04	3.39E-04	1.23E-04	3.72E-04	1.18E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	1.01E-02	6.78E-03	2.46E-03	7.44E-03	1.18E-02
Beta Air Dose	mrad	1.82E-04	1.45E-04	4.46E-05	1.49E-04	4.55E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	1.82E-03	1.45E-03	4.46E-04	1.49E-03	2.28E-03
Maximum Individual						
Total Body	mrem	3.37E-04	2.24E-04	8.14E-05	2.47E-04	7.81E-04
Skin	mrem	5.41E-04	3.67E-04	1.31E-04	3.99E-04	1.26E-03
Location						
Unit 1	miles	1.70 SSE	0.78 NW	1.40 SSW	1.70 SSE	1.70 SSE
Unit 2	miles	1.88 SSE	0.74 NW	1.14 SSW	1.88 SSE	1.88 SSE
Unit 3	miles	1.73 SSE	0.65 NW	1.00 SSW	1.73 SSE	1.73 SSE
Maximum Organ Dose(1) From All Radionuclides						
	Age	Infant	Child	Child	Child	Child
	Organ	Bone	Bone	Bone	Bone	Bone
	mrem	9.18E-01	7.14E-01	5.33E-01	8.69E-01	2.97E+00
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	1.22E+01	9.52E+00	7.11E+00	1.16E+01	1.98E+01
Location						
Unit 1	miles	1.70 SSE	0.78 NW	1.40 SSW	1.70 SSE	1.70 SSE
Unit 2	miles	1.88 SSE	0.74 NW	1.14 SSW	1.88 SSE	1.88 SSE
Unit 3	miles	1.73 SSE	0.65 NW	1.00 SSW	1.73 SSE	1.73 SSE
Maximum Organ Dose(1) From All Radionuclides Excluding C-14						
	Age	Teen	Child	Teen	Teen	Teen
	Organ	Thyroid (2)	Lung	Thyroid (2)	Thyroid (2)	Lung
	mrem	1.74E-01	5.71E-02	7.38E-02	1.61E-01	4.56E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit(2)	%	2.32E+00	7.61E-01	9.84E-01	2.15E+00	3.04E+00
Organ Dose from tritium only for Unit 2 location above	mrem	1.74E-01	5.63E-02	7.37E-02	1.61E-01	4.54E-01
Fraction of organ dose from tritum only for Unit 2 location above	%	1.00E+02	9.86E+01	9.99E+01	1.00E+02	9.96E+01
X/Q for U2 Location Above	sec/m3	7.45E-06	6.51E-07	2.26E-06	7.96E-06	5.16E-06
D/Q for Unit 2 location above	m-2	2.58E-09	9.64E-10	1.19E-09	2.58E-09	1.86E-09
(1) Excluding skin (2) ODCM Requirement 5.1 has higher limits than ODCM Requirement 4.2; therefore the percent of limits						