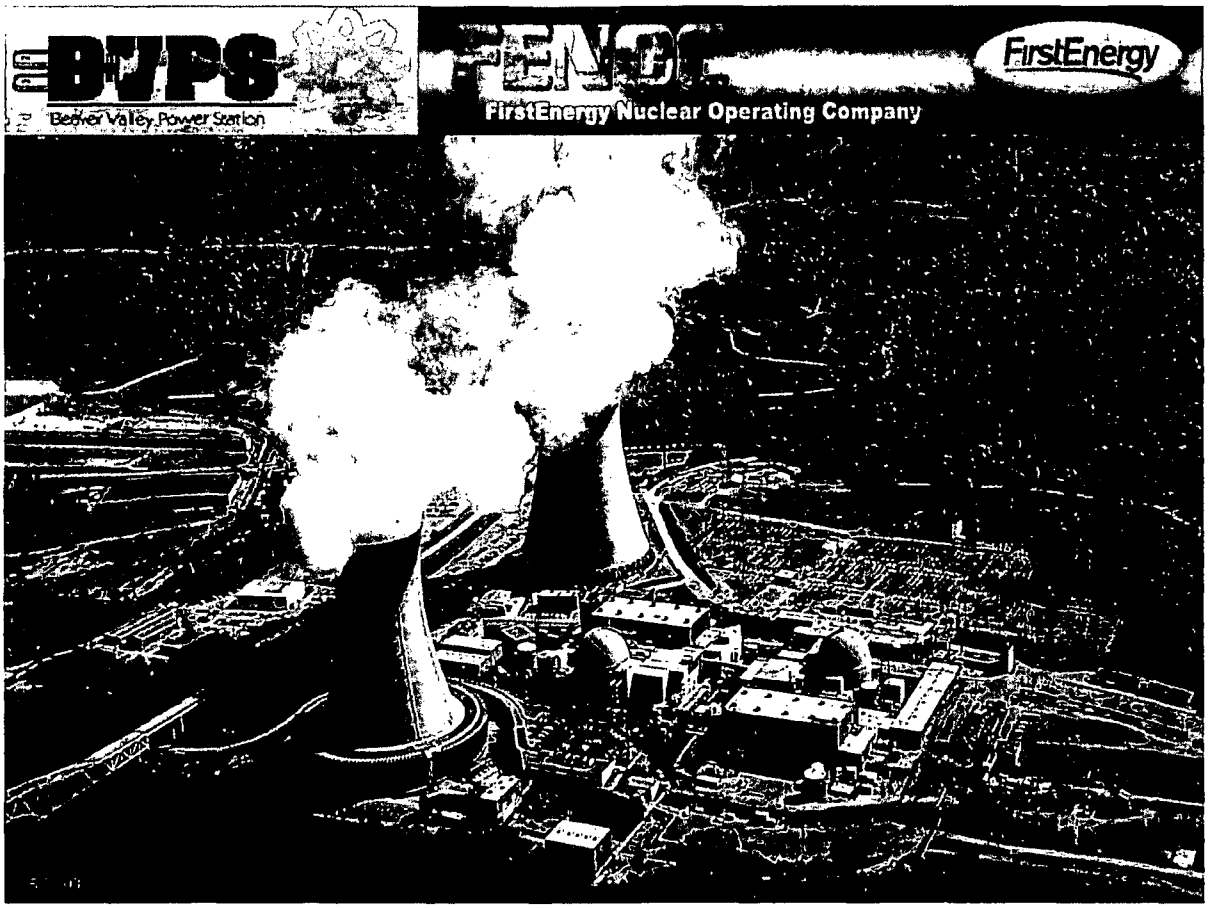
RTL# A9.690E

FIRSTENERGY NUCLEAR OPERATING COMPANY

BEAVER VALLEY POWER STATION



2006 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

AND

2006 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

UNITS NO. 1 AND 2

LICENSES DPR-66 AND NPF-73

BEAVER VALLEY POWER STATION

ENVIRIONMENTAL & CHEMISTRY SECTION

Technical Report Approval:

2006 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

AND

2006 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

UNITS NO. 1 AND 2

LICENSES DPR-66 AND NPF-73

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Subject: **Beaver Valley Power Station, Unit Nos. 1 and 2**
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Annual Radioactive Effluent Release Report for 2006, and
Annual Radiological Environmental Operating Report for 2006

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BVRC - *Keywords: Annual Radioactive Effluent Release Report, Annual Radiological Environmental Operating Report*

I. Overall Summary of BVPS Effluent and Environmental Programs:

Report Submittal: The attached documents represent a combined submittal comprised of the Annual Radioactive Effluent Release Report (ARERR), and the Annual Radiological Environmental Operating Report (AREOR). The ARERR (also referred to as the Annual RETS Report) is provided as Enclosure 2. The AREOR (also referred to as the Annual REMP Report) is provided as Enclosure 3.

This report has been produced in color to provide clarity for the reader. Specifically, items in BLUE are highlighted to indicate changes in information from that provided in previous reports. Also, all graphs provided with this report are shown in color and should not be reproduced (from the report) by methods that provide only black and white results.

This report is comprised of results from the RETS and REMP programs that are described in the BVPS Unit 1 and Unit 2 Offsite Dose Calculation Manual (ODCM) and are summarized as follows:

- **RETS Program and Report Results:** The Controls for the Radiological Effluent Technical Specification (RETS) Program are outlined in ODCM procedure 1/2-ODC-3.03, *Controls for RETS and REMP Programs*. The RETS Controls were followed throughout the report period. Adherence to the RETS Controls (e.g.; sampling, analysis and offsite dose projection requirements), along with adherence to more restrictive Administrative Controls delineated in site implementing procedures, demonstrate the proficiency of radioactive effluent control at BVPS. Also, results of the sample analyses, coupled with the offsite dose projections demonstrate that BVPS operations should not produce any adverse affect on the surrounding environment.

- **REMP Program and Report Results:** The Controls for the Radiological Environmental Monitoring Program (REMP) are outlined in ODCM procedure 1/2-ODC-3.03, *Controls for RETS and REMP Programs*. The REMP Controls were followed throughout the report period. Adherence to the REMP Controls (e.g.; sampling and analysis requirements) demonstrated the proficiency of radiological environmental monitoring. Also, results of the various environmental sample media validate the offsite dose projections made in accordance with the RETS Controls. In summary, the results demonstrate that BVPS operations did not adversely affect the surrounding environment.

II: Detailed Summary of Enclosure 2 - Annual RETS Report (ARERR) for 2006:

Report Submittal and Requirements: The ARERR was prepared and submitted in accordance with the requirements contained in the following documents:

- BVPS Unit 1 Technical Specifications, Administrative Control 6.9.3
- BVPS Unit 2 Technical Specifications, Administrative Control 6.9.3
- NUREG-1301, "*Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors, Generic Letter 89-01, Supplement No.1, April 1991*"
- Regulatory Guide 1.21, "*Measuring Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Material in Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants, Revision 1, June 1974*"
- ODCM procedure 1/2-ODC-3.03, "*Controls for RETS and REMP Programs*", Attachment U, Control 6.9.3
- BVPS procedure 1/2-ENV-01.05, "*Compliance with Regulatory Guide 1.21 and Technical Specifications*"
- **BVPS Condition Report No. CR06-01619 and SAP Order No. 200197646-0120 are associated with an abnormal gas release.**
- **BVPS Condition Report No. CR06-05181 and SAP Order No. 200168331, 200223880 and 200197646-0180 are associated with failure to return an effluent flow rate measurement device to operable status within 30-day.**
- **BVPS Condition Report No. CR06-11975 and SAP Order No. 200197646-0230, are associated with an abnormal gas release.**
- **BVPS Condition Report No. CR07-12513 and SAP Order No. 200197646-0200 are associated with an unavailable liquid waste composite sample.**

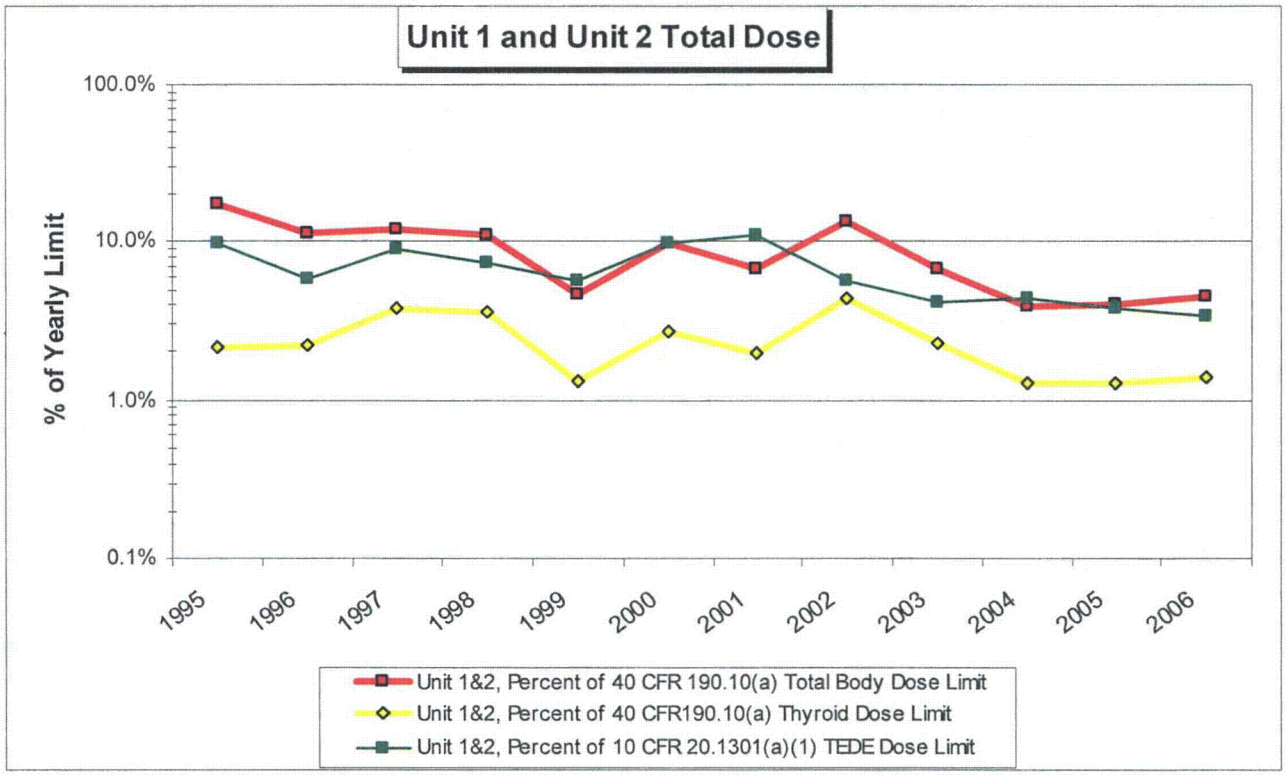
Summary of the BVPS RETS Program for Liquid and Gaseous Effluent Control

- **Trends of Total Dose:** The following graph provides a comparison of the ODCM dose projections from all facility releases and direct radiation exposures to show compliance with Member of the Public dose limits from 10 CFR 20.1302 and 40 CFR Part 190. The graph reflects the results of the efforts to stabilize and reduce offsite dose.

40 CFR 190.10(a)
1.12 mrem = Total Body Dose, or
4.47% of the 25 mrem annual limit

40 CFR 190.10(a)
1.05 mrem = Thyroid Dose, or
1.40% of the 75 mrem annual limit

10 CFR 20.1302
3.44 mrem = Total Effective Dose Equivalent, or
3.44% of the 100 mrem annual limit



- **Trends of Offsite Dose:** The graphs on the following pages provide a comparison of ODCM dose projections for the last several years to show compliance with Members of the Public dose limits from 10 CFR Part 50.

- **Total Population Dose vs Natural Background:** The 0-50 mile total and average population doses were calculated using liquid and gaseous release quantities and real time meteorology. The average population dose is based on 4 million people within 0-50 miles of the BVPS site. The following comparison to natural background radiation demonstrates that BVPS operations did not adversely affect the surrounding environment:

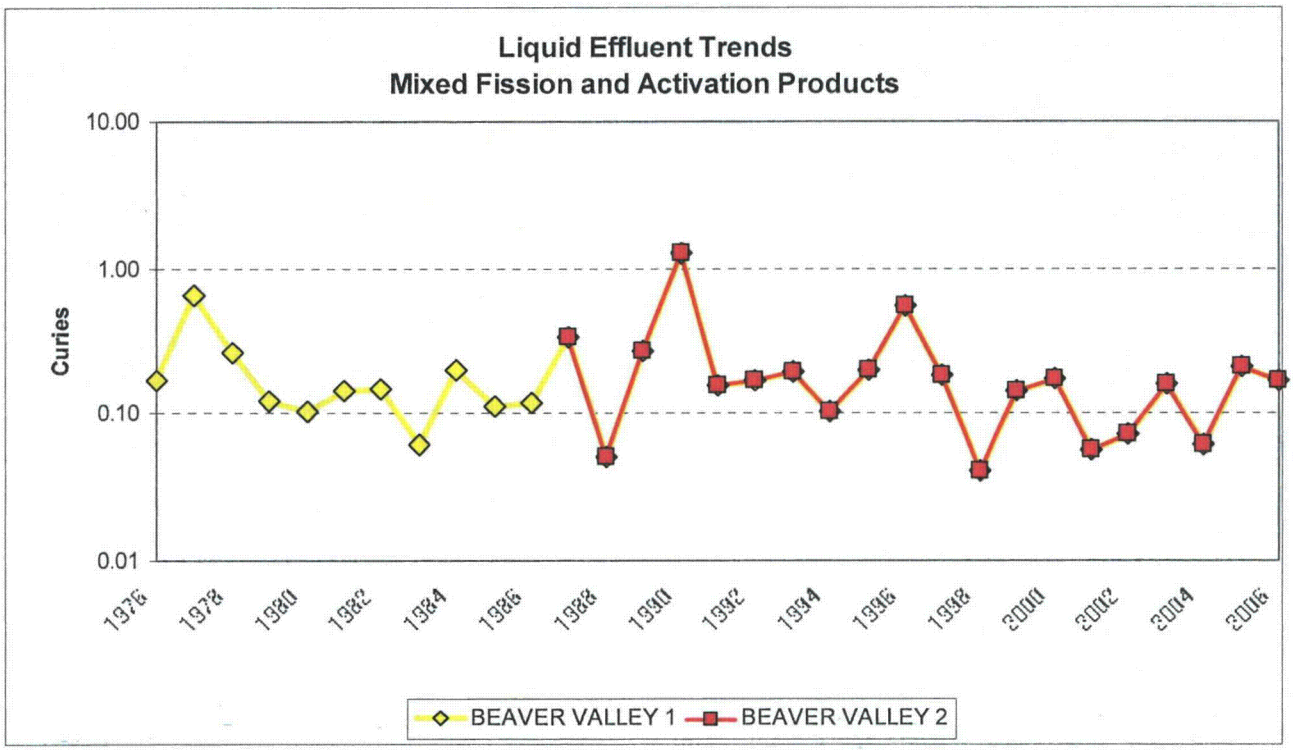
  655 man-mrem =BVPS Total Population Dose for the year

  0.0001638 mrem = BVPS Average Individual Dose for the year

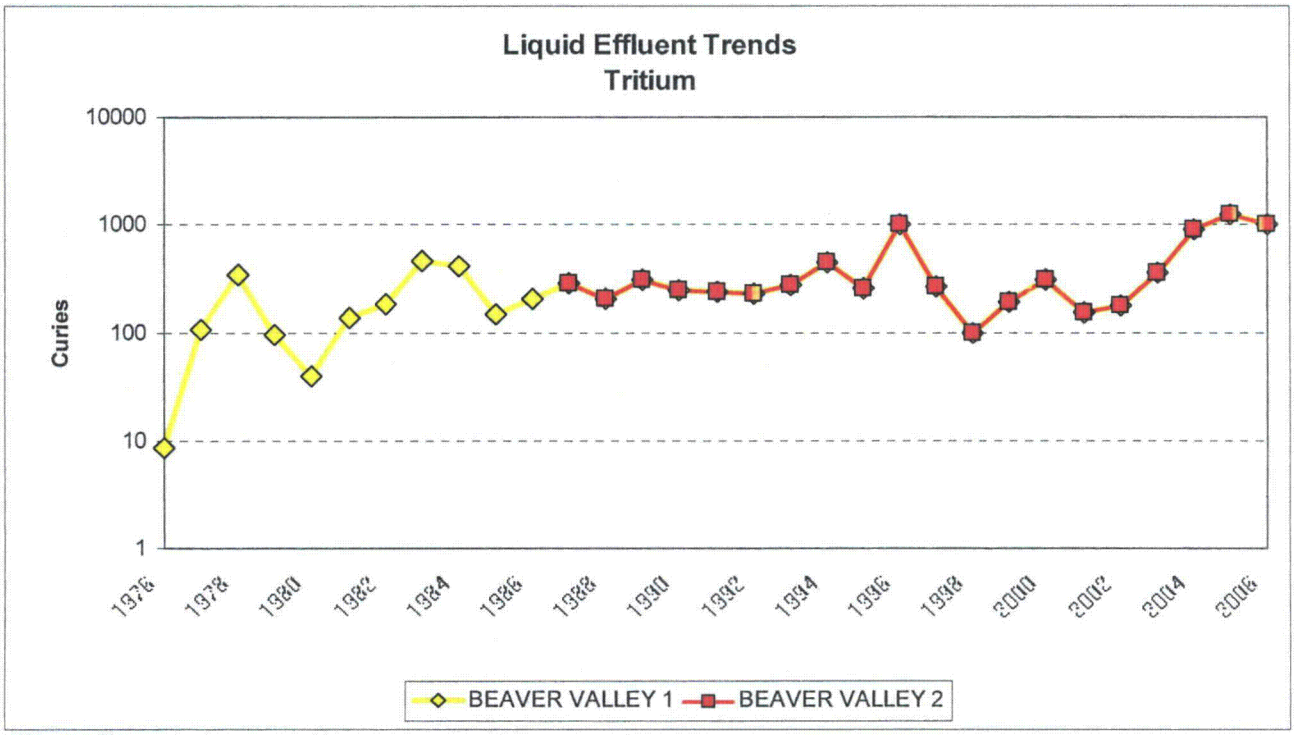
  296 mrem = Natural Background Individual Dose for the year. This dose value is documented as natural background radiation exposure for an individual in a year from the 1990 BEIR V Report.

- **Liquid Release Volume:** Unit 1 and Unit 2 discharged 7,650,000 liters of liquid waste.

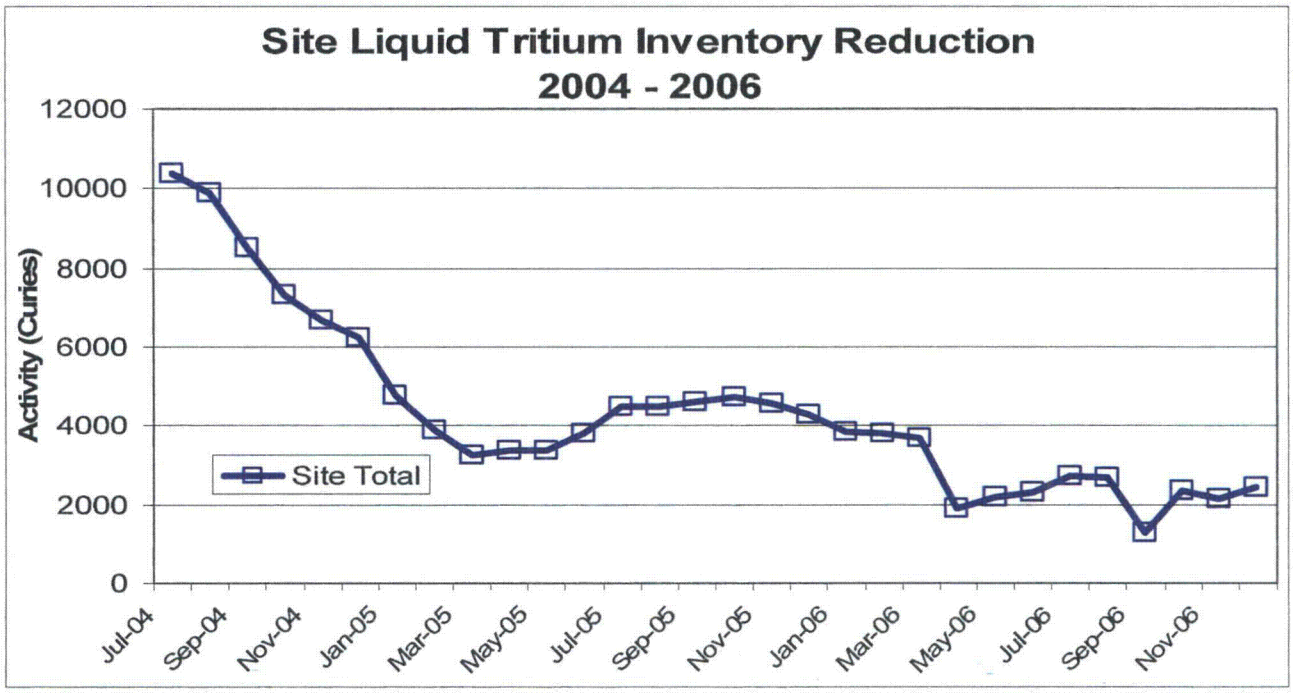
- **Liquid Release Activity (Excluding Tritium):** The total mixed fission and activation product (particulate) radioactivity discharged from the site was 0.343 Curies.



- **Liquid Release Tritium Activity:** The total tritium radioactivity discharged from the site was 2030 Curies.



- **Liquid Tritium Inventory Reduction:** In July 2004, the site initiated an Action Plan to reduce the site liquid tritium inventory. This effort will ensure future offsite dose (due to evaporation of tritiated water from the spent fuel pools) is reduced. The following graph shows progress made toward the reduction of site liquid tritium inventory.



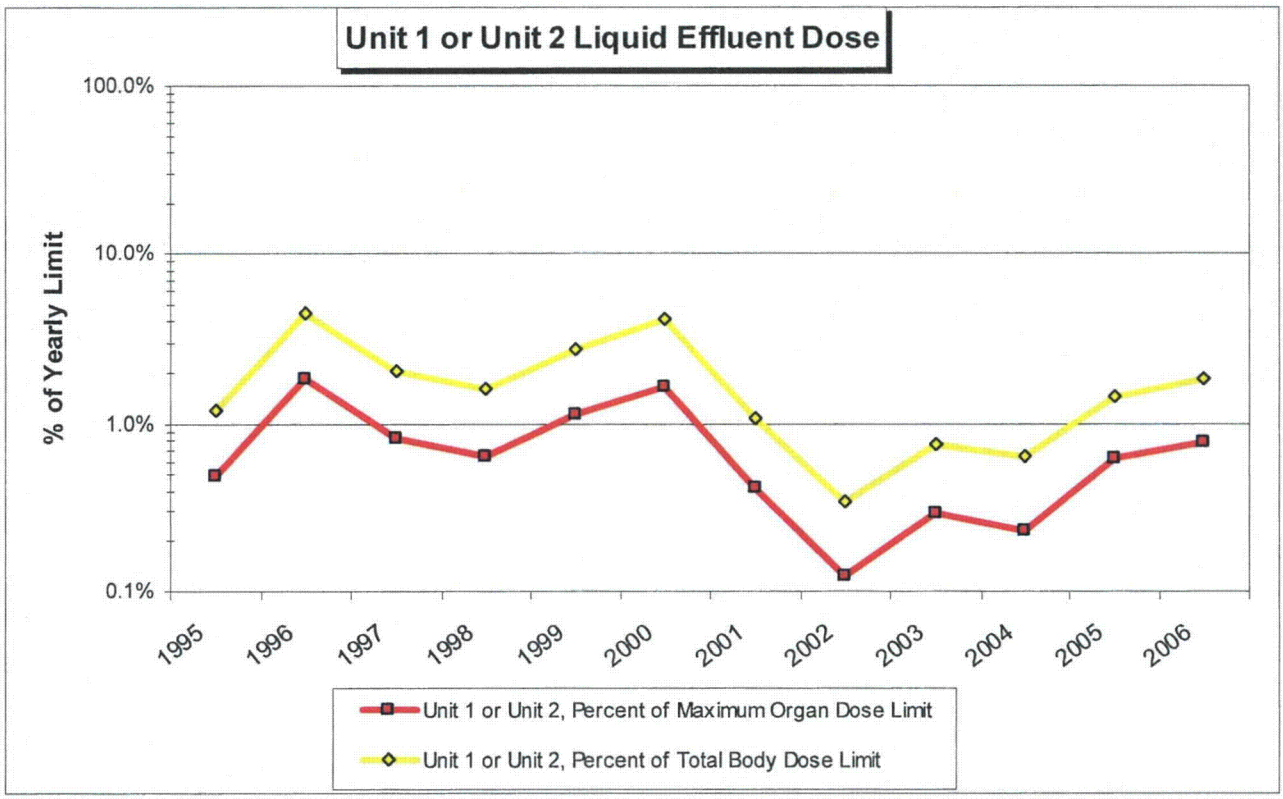
- **Liquid Release Offsite Dose Projections:** The following offsite dose projections were calculated to the maximum individual per 10 CFR 50, Appendix I and the ODCM. The projections use ODCM default flow rates for the receiving water (Ohio River). The projections were performed prior to release authorization, and are summarized as follows:

10 CFR Part 50, Appendix I
0.0547 mrem = Unit 1 Total Body Dose, or
1.823% of the 3 mrem annual limit

10 CFR Part 50, Appendix I
0.0787 mrem = Unit 1 Highest Organ Dose, or
0.787% of the 10 mrem annual limit

10 CFR Part 50, Appendix I
0.0547 mrem = Unit 2 Total Body Dose, or
1.823% of the 3 mrem annual limit

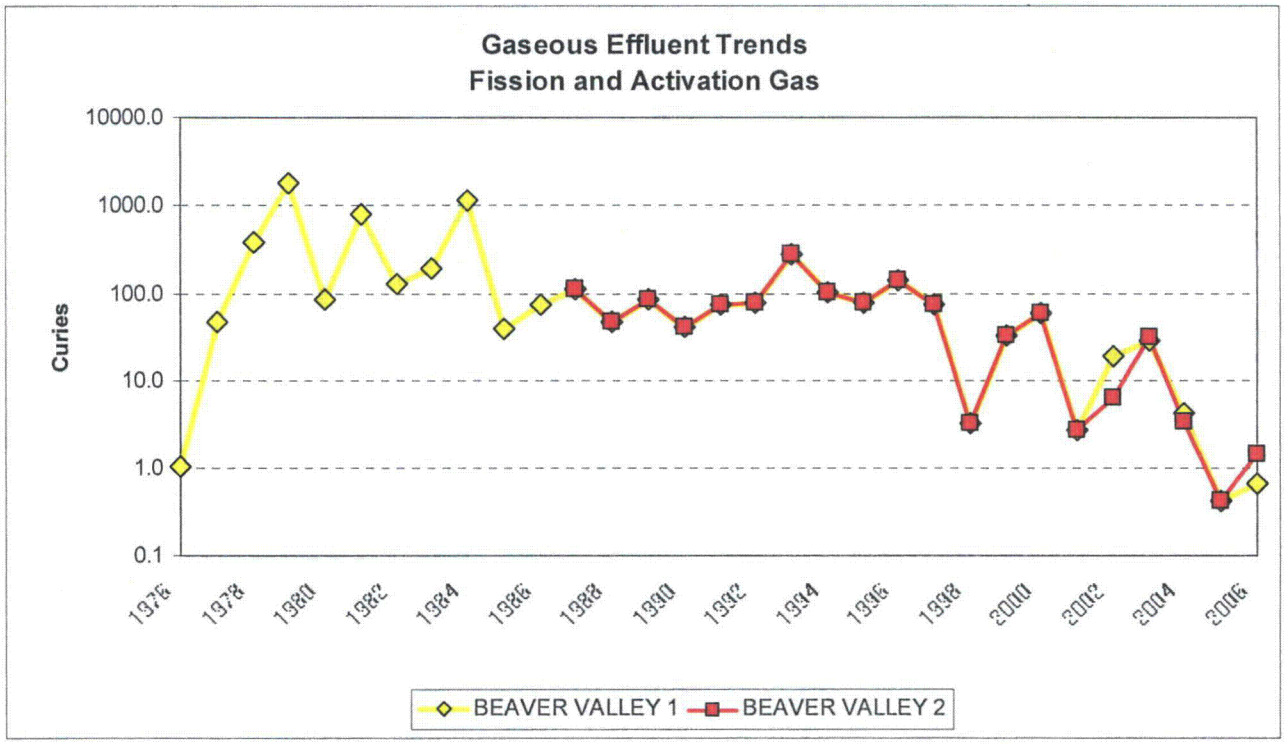
10 CFR Part 50, Appendix I
0.0787 mrem = Unit 2 Highest Organ Dose, or
0.787% of the 10 mrem annual limit

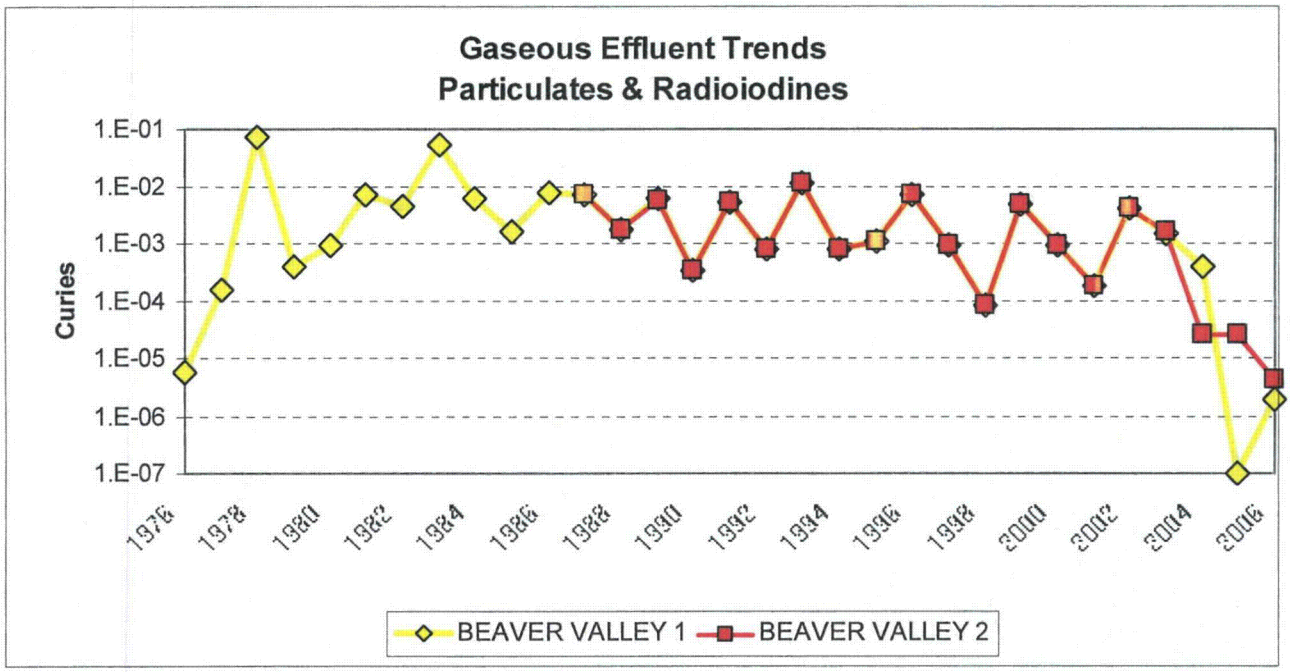


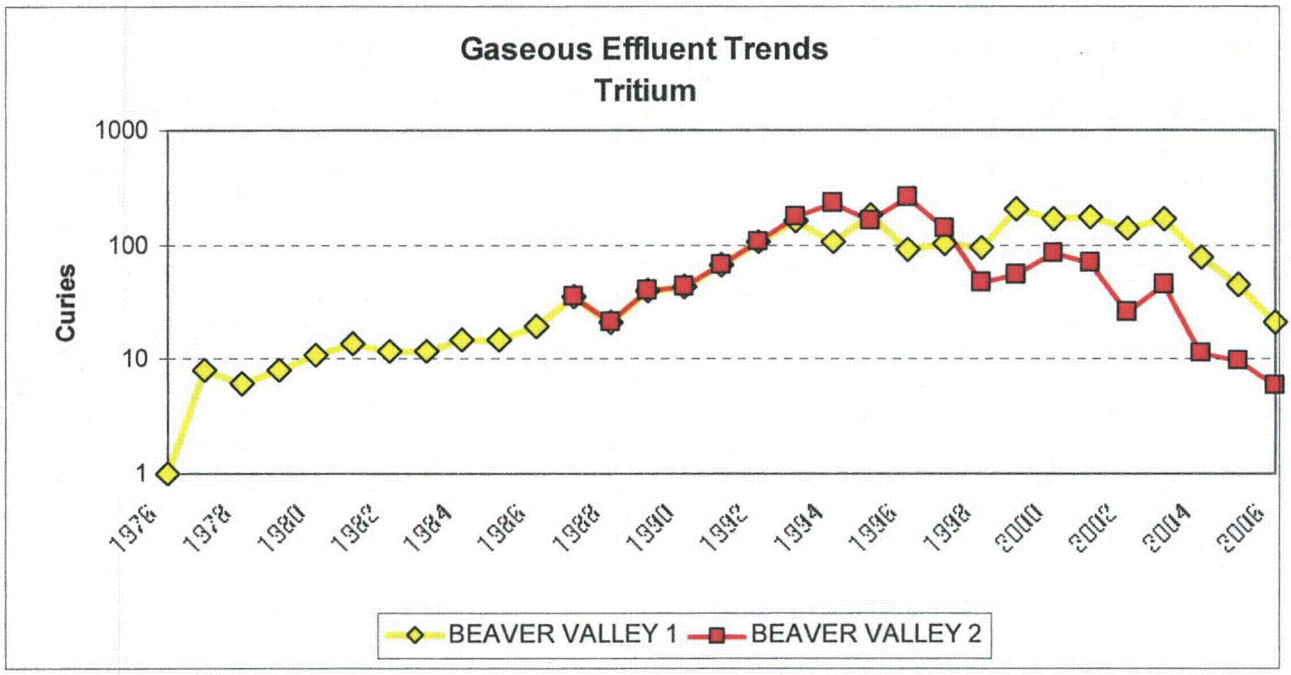
- **Liquid Radwaste Treatment Sytstem:** The BVPS site operates with the concept of a shared Liquid Radwaste Treatment System, even though each Unit has its own system of ion-exchange vessels. Using this concept allowed either Unit to process liquid waste at the Unit of origin, or at the other Unit. Typically, when Unit 1 or Unit 2 high level liquid waste was processed (e.g.; coolant recovery waste) it was performed at Unit 1, because that system has an additional carbon pre-conditioning filter (50 cubic feet).

- **Abnormal Liquid Releases:** There were no abnormal liquid releases during the report period.

- **Gaseous Release Activity:** The total radioactivity discharged from all site gaseous releases was 2.13 Curies of fission and activation gases, 0.00000273 Curies of Iodine-131, 0.00000433 Curies of particulates with half-lives >8 days, no detectable gross alpha, and 27.4 Curies of tritium.







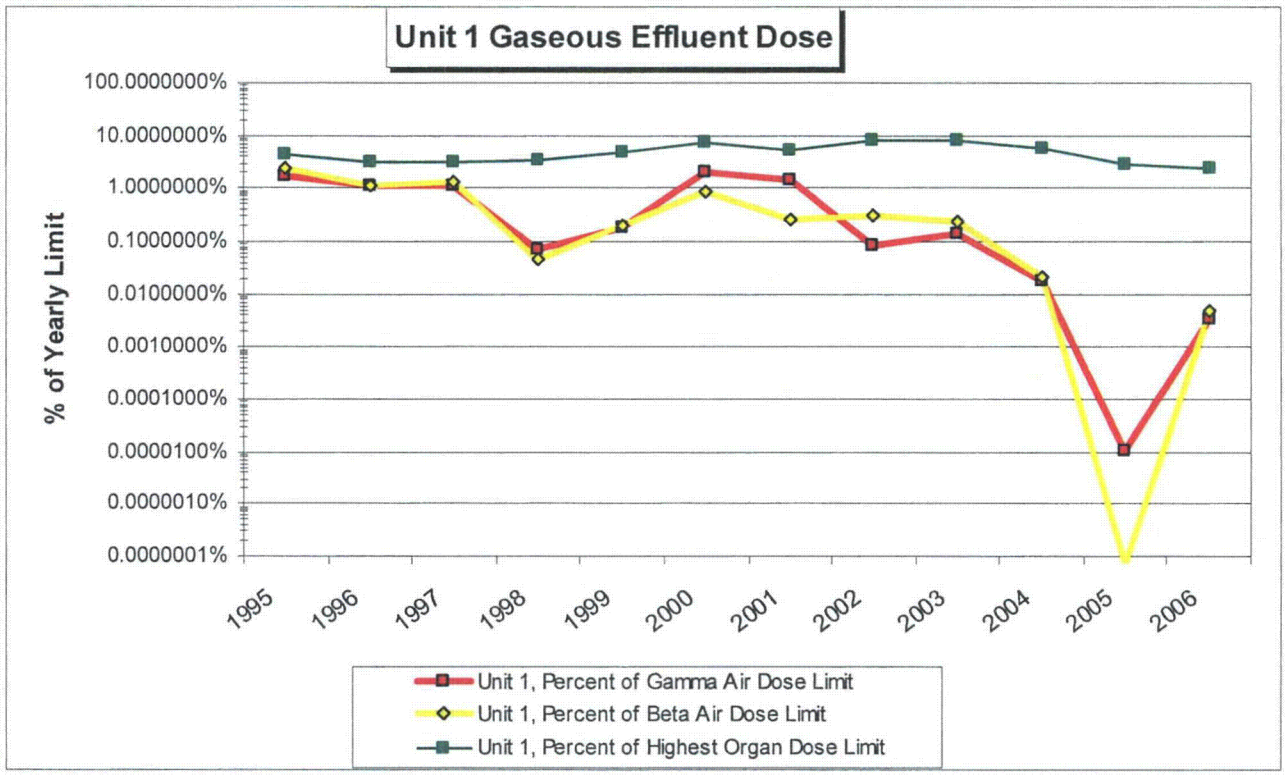
- **<u>Gaseous Radwaste Treatment System:</u>** The BVPS site operates with the concept of a shared Gaseous Radwaste Treatment System, even though each Unit has its own system of charcoal delay beds and storage/decay tanks. Using this concept allowed either Unit to process gaseous waste at the Unit of origin, or at the other Unit. Typically, when Unit 1 or Unit 2 went to a shutdown condition, the gaseous waste was sent for storage and decay at Unit 2 because that system has 4 additional storage tanks.

- **Unit 1 Gaseous Release Offsite Dose Projections:** The following offsite dose projections were calculated to the maximum individual per 10 CFR 50, Appendix I and the ODCM. The projections use ODCM default meteorological parameters for the atmospheric conditions surrounding the plant site. The offsite dose projections during the report period were performed prior to release authorization, and are summarized as follows:

10 CFR Part 50, Appendix I
0.00033 mrad = Unit 1 Gamma Air Dose, or
0.0033% of the 10 mrad annual limit

10 CFR Part 50, Appendix I
0.00099 mrad = Unit 1 Beta Air Dose, or
0.0049% of the 20 mrad annual limit

10 CFR Part 50, Appendix I
0.352 mrem = Unit 1 Highest Organ Dose, or
2.3447% of the 15 mrem annual limit

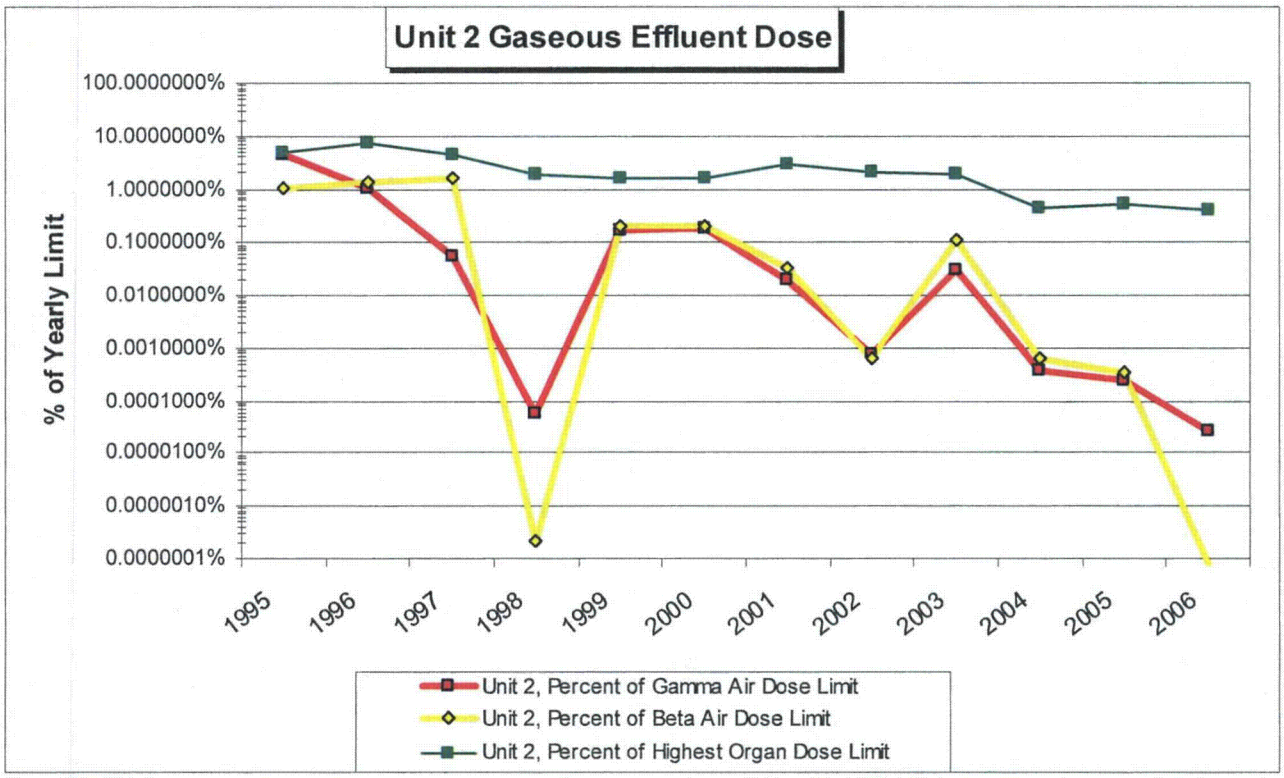


- **Unit 2 Gaseous Release Offsite Dose Projections:** The following offsite dose projections were calculated to the maximum individual per 10 CFR 50, Appendix I and the ODCM. The projections use ODCM default meteorological parameters for the atmospheric conditions surrounding the plant site. The offsite dose projections during the report period were performed prior to release authorization, and are summarized as follows:

10 CFR Part 50, Appendix I
0.0000027 mrad = Unit 2 Gamma Air Dose, or
<0.0001% of the 10 mrad annual limit

10 CFR Part 50, Appendix I
<0.000001 mrad = Unit 2 Beta Air Dose, or
<0.0001% of the 20 mrad annual limit

10 CFR Part 50, Appendix I
0.0611 mrem = Unit 2 Highest Organ Dose, or
0.4070% of the 15 mrem annual limit



- **Abnormal Gaseous Releases:** There were two (2) abnormal gaseous releases during the report period. The 1st release involved loss of 126 cubic feet of gas space over a 21-day period with a release activity of 0.00916 Curies. The 2nd release involved loss of 101 cubic feet of gas space over a 117-day period with a release activity of 0.00023 Curies. Each release was well within the offsite dose rate limits and offsite dose limits specified in the ODCM. The details associated with these releases are described in Enclosure 2, page iii.

- **Effluent Monitoring Channels Inoperable >30 Days:** There was one (1) Effluent Monitoring Instrumentation Channels not returned to Operable status within 30 days during this report period. The details of why the Unit 1 Liquid Waste Contaminated Drain Line Flow Rate Measurement Device [FR-1LW-103] exceeded the 30-day criteria are provided in Enclosure 2, Table 6.

- **ODCM Surveillance Deficiencies:** There was one (1) ODCM Surveillance Deficiency during the report period. The description of a missing liquid waste composite sample is described in Enclosure 2, Table 8. There were no other deficiencies associated ODCM required Surveillances for monitoring, sampling & analysis and offsite dose projection.

- **ODCM Changes:** There were two (2) changes made to the ODCM during the report period. The major reason for the ODCM changes was to support the Technical Specification Amendments that permit uprate of the plant output. The ODCM changes maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also, the ODCM changes will not impact the accuracy or reliability of effluent dose or alarm setpoint calculation. Detailed descriptions of the ODCM changes are provided in Enclosure 2, Table 9.

III. Detailed Summary of Enclosure 3 - Annual REMP Report (AREOR) for 2006:

Report Submittal and Requirements: The AREOR was prepared and submitted in accordance with the requirements contained in the following documents:

- Unit 1 Technical Specifications, Administrative Control 6.9.2
- Unit 2 Technical Specifications, Administrative Control 6.9.2
- NUREG-1301, "*Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors, Generic Letter 89-01, Supplement No.1, April 1991*"
- Regulatory Guide 1.21, "*Measuring Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Material in Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants, Revision 1, June 1974*"
- ODCM procedure 1/2-ODC-3.03, Attachment T, Control 6.9.2, "*Controls for RETS and REMP Programs*"
- BVPS procedure 1/2-ENV-01.05, "*Compliance with Regulatory Guide 1.21 and Technical Specifications*"
- BVPS procedure 1/2-ENV-02.01, "*Description of Overall Radiological Environmental Monitoring Program*"
- BVPS Condition Report No. CR06-9951 and SAP Order No. 200197646-0150 are associated with the loss of automatic water sampling capability.
- BVPS Condition Report No. CR06-09984 and SAP Order No. 200197646-0170 are associated with interruption of doe goat milk sampling.
- BVPS Condition Report No. CR06-01028 and SAP Order No. 200197646-0170 are associated with interruption of doe goat milk sampling.
- BVPS Condition Report No. CR07-12344 and SAP Order No. 200197646-0190 are associated with surface water I-131 analysis above the reporting level.

Summary of the BVPS REMP Program for Determination of Environmental Impact

- **Sample Media and Analyses**: Results for precipitation, ground water, sediment, food, fish, TLDs, feed crop, food crop, air particulate and air radioiodine media remained consistent with previous years' data. Minor increases and decreases were noted. All positive results attributable to the BVPS operation were consistent with station data of authorized radioactive discharges and were within limits permitted by the NRC license and the ODCM. Other radioactivity detected was attributable to naturally occurring radionuclides, previous nuclear weapons tests, other man-made sources, and to the normal statistical fluctuation for activities near the Lower Limit of Detection (LLD). With exception to identification of Cobalt-58, Cobalt-60 and Cesium-137 in the sediment at the outfall facility, the pre-operational values were not exceeded during the report period.

- **Deviations from Normal Milk Sampling & Analysis Schedule**: The Bi-weekly Doe Goat milk sampling was interrupted during the report period. Although the Doe Goats could not be sampled during that period, the minimum sampling and requirements were still met. This condition and Associated Corrective Actions are documented in Condition Report No. CR06-01028-01, CR06-9984 and SAP Order 200197646-0170.

- **Deviations from Normal Drinking Water Sampling and Analysis Schedule:** The automatic drinking water sampling station at Midland, PA was found to have an unusually low volume in the collection vessel on two (2) separate occasions. This condition and associated Corrective Actions are described in Condition Report CR06-9951, and SAP Order 200197646-0160.

- **Population Dose - Liquid Releases:** The calculated 0-50 mile population dose from liquid releases was 552 man-mrem. This population dose compares favorably to the 942 man-mrem dose for the previous year.

- **Population Dose - Gaseous Releases**: The calculated 0-50 mile population dose from gaseous releases was 103 man-mrem. This population dose compares favorably to the 296 man-mrem dose for the previous year.

- **Land Use Census Results:** Highlights from the most recent Land Use Census are documented in letter NPD3NRE:0381, dated September 26, 2006 and are summarized as follows:

  1) The nearest resident has not changed since the previous census. The location is at 211 Ferry Hill Road, Shippingport, PA (0.406 miles NE).

  2) The nearest garden >500 square feet has not changed since the previous census. The location is at 238 State Route 168, Hookstown, PA (0.760 miles SSW).

  3) The nearest dairy cow milked has not changed since the previous census. The location is still at **Searight Dairy**, 948 McCleary Road, RD 1, Hookstown, PA (2.097 miles SSW).

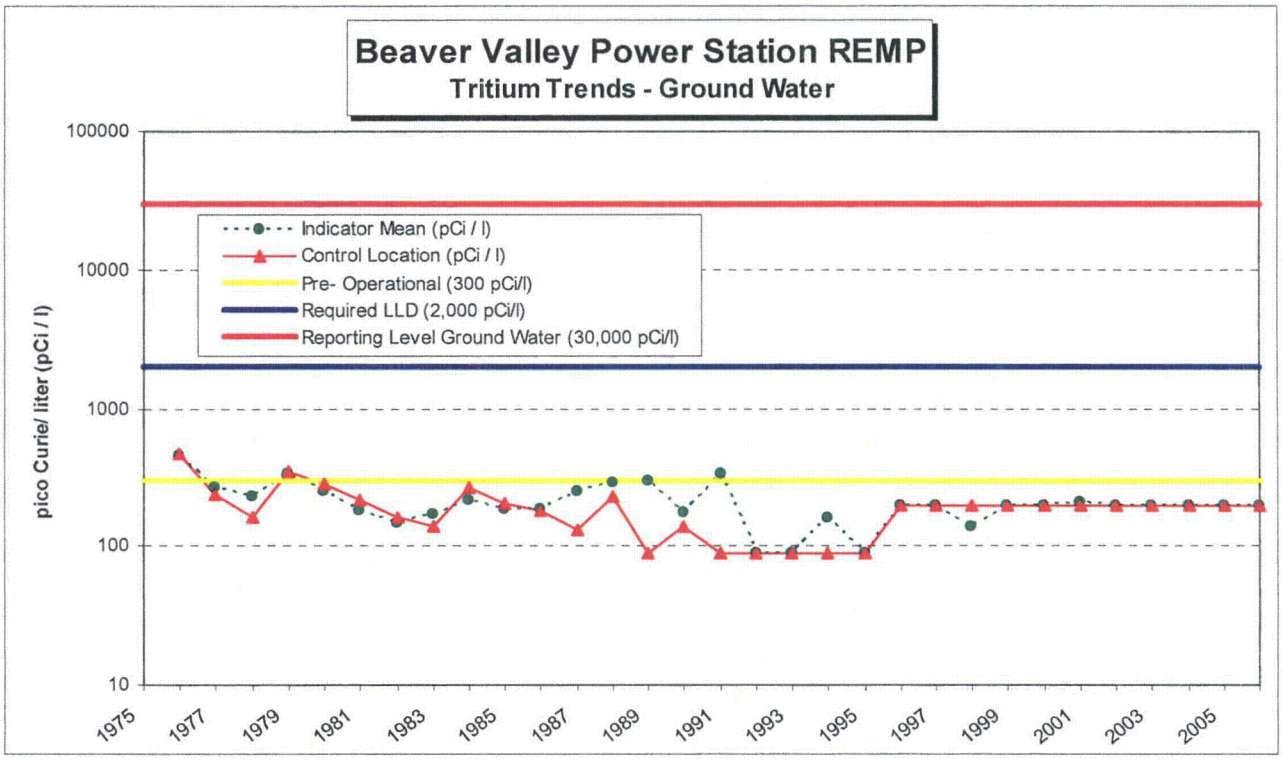
4) The nearest doe goat milked has not changed since the previous census. The location is still at **Moore Farm,** 982 State Route 168, Hookstown, PA (2.120 miles SW). This is not the nearest location, but it is the nearest location providing samples.

5) The nearest beef cattle location has not changed since the previous census. The location is still at 105 Shippingport Road, Shippingport, PA (1.405 miles ENE).

6) Using the results of the 2006 Land Use Census, the 2007 dairy cow milk sampling locations will remain at the same locations used in 2006. The locations are; **Searight Dairy**, 948 McCleary Road, RD1, Hookstown, PA (2.097 miles SSW), **Halstead Dairy**, 104 Tellish Drive, Hookstown, PA (5.079 miles SSW), **Brunton Dairy**, 3681 Ridge Road, Aliquippa, PA (6.158 miles SE), and **Weindsheimer Dairy**, RD 1 Burgettstown, PA (10.476 miles SSW).

7) Using the results of the 2006 Land Use Census, the 2007 doe goat milk sampling locations will also remain at the same locations used in 2006. The locations are; **Moore Farm**, 982 State Route 168, Hookstown, PA (2.120 miles SW), and **Collins Farm**, 289 Calhoun Road, Aliquippa, PA (3.547 miles, SE).

- **Groundwater Monitoring:** A total of six (6) offsite ground water samples were collected and analyzed for Tritium and by gamma spectrometry during the report period. The samples were collected on a semi-annual basis from three (3) locations within four (4) miles of the site. The locations included one (1) well in Shippingport, PA, one (1) well in Hookstown, PA, and one (1) well in Georgetown, PA. No gamma-emitting radionuclides were detected in the analyses. Also all tritium results were less than LLD. The following graph shows that offsite groundwater tritium is less than the pre-operational value.



- **Split Sample Program (Inter-laboratory Comparison, Part 1 of 2):** BVPS shared split sample data with the Pennsylvania Department of Environmental Protection (PADEP) in support of the nuclear power plant monitoring program. The shared media and number of locations are typically comprised of; milk (1), surface water (3), sediment (1), fish (1), food crops (2), co-located air particulate/air iodine (4), and TLD (24). The split sample program is coordinated by the state, and the results are not provided with this report.

- **Spike Sample Program (Inter-laboratory Comparison, Part 2 of 2):** Spiked samples were provided by an independent laboratory and then analyzed by the REMP contractor laboratory. The samples were provided throughout the report period and included water samples, milk samples, filter paper samples and charcoal cartridge samples. All one-hundred-twelve (112) analyses performed by the contactor laboratory on the spiked samples met the NRC comparison criteria.

Beaver Valley Power Station - Units 1 & 2

2006 Annual Radioactive Effluent Release Report

FirstEnergy Nuclear Operating Company
FENOC

Beaver Valley Power Station - Units 1 & 2
Unit 1 License No. DPR-66
Unit 2 License No. NPF-73

Annual Radioactive Effluent Release Report

Calendar Year - 2006

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Note: The Total Error values (%) listed in this report are documented in Calculation Package No. ERS-ATL-04-002

Annual Radioactive Effluent Release Report

Calendar Year - 2006

Abnormal Release Summary

Abnormal Liquid Release: None

Abnormal Gas Release (1 of 2): On 03/06/06, RWDA-G-1704 was generated to quantify the potential for discharge of 126 cuft of gas space from Unit 2 Gaseous Waste Storage Tanks [2GWS-TK25A thru 25G]. The RWDA-G assumed discharge of 0.00916 Curies of noble gas via an observed 2 psig pressure drop over the 21-day period 02/13/06 (20 psig) thru 03/06/06 (18 psig). All Dose Rate and Dose release limits specified in Offsite Dose Calculation Manual procedure 1/2-ODC-3.03 (ODCM: Controls for RETS & REMP Programs) were met with this release. The undiluted release rate of noble gas during the 21-day period period was only 0.0042 cfm, which entered into the dilution stream of ~1000 cfm. Although this is an insignificant release of Noble Gas, it was determined to be an Abnormal Release for the following reasons:

1) The discharge was not pre-authorized per ODCM, and Regulatory Guide 1.21 requirements.
2) A decay of <21 days does not meet the UFSAR minimum decay period of 30 days.

The details of this release and associated Corrective Actions are documented in BVPS Condition Report No. CR06-01619, and BVPS-SAP Order No. 200197646-120.

Abnormal Gas Release (2 of 2): On 02/13/07, RWDA-G-1730A was generated to quantify the discharge of 101 cuft of gas space from Unit 1 Gaseous waste decay Tank [1GW-TK-1A]. The RWDA-G assumed discharge of 0.00023 Curies via an observed 11.18 psig pressure drop over the period 09/12/06 (45.83 psig) thru 12/30/06 (34.65 psig). All Dose Rate and Dose release limits specified in ODCM procedure 1/2-ODC-3.03 (ODCM: Controls for RETS and REMP Programs were met. In fact, all previous Dose Rate and Dose totals were unaffected by the addition of the 117-days of tank leakage. Although the total Noble Gas release of 0.00023 Curies over the 117-day period is insignificant, it was determined to be an Abnormal Release for the following reasons:

1) The discharge was not pre-authorized per the ODCM, and Regulatory Guide 1.21 requirements.
2) A decay of <21 days does not meet the UFSAR minimum decay period of 30 days.

The details of this release and associated Corrective Actions are documented in BVPS Condition Report No. CR06-11975, and BVPS-SAP Order No. 200197646-230.

Annual Radioactive Effluent Release Report

Calendar Year - 2006

Supplemental Information Page

FACILITY: B.V.P.S. Units 1 and 2 LICENSEE: FENOC

1. Regulatory Limits	
a. Fission and activation gases:	Annual Unit 1 or 2 Dose: 10 mrad from Gamma, & 20 mrad from Beta
b. Iodines & particulates, half-lives > 8 days:	Annual Unit 1 or 2 Dose: 15 mrem to Any Organ
c. Liquid effluents:	Annual Unit 1 or 2 Dose: 3 mrem to Total Body, & 10 mrem to Any Organ

2. Maximum Permissable Concentrations Used In Determining Allowable Release Rates Or Concentrations	
a. Fission and activation gases:	Site Release Rate: 500 mrem/yr to Total Body, & 3000 mrem/yr to the Skin
b. Iodines & particulates, half-lives > 8 days:	Site Release Rate: 1500 mrem/yr to Any Organ
c. Liquid effluents:	Site Release Concentration: 10 times 10 CFR 20 Appendix B, Table 2, EC's

3. Average Energy (Not Applicable To The BVPS ODCM)

4. Measurements and Approximations of Total Radioactivity	
The methods used to measure or approximate the total radioactivity in effluents, and the methods used to determine radionuclide composition are as follows:	
a. Fission and activation gases:	Ge Gamma Spectrometry, Liquid Scintillation Counter
b. Iodines:	Ge Gamma Spectrometry
c. Particulates, half-lives > 8 days:	Ge Gamma Spectrometry, Proportional Counter
d. Liquid effluents:	Ge Gamma Spectrometry, Proportional Counter, Liquid Scintillation

5. Batch & Abnormal Release Information	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year
a. Liquid Batch Releases						
1. Number of batch releases		18	23	51	39	131
2. Total time period for batch releases	minutes	9313	11988	23657	20659	65617
3. Maximum time period for a batch release	minutes	1050	1320	1320	2808	2808
4. Average time period for batch releases	minutes	517	521	464	530	501
5. Minimum time period for a batch release	minutes	255	2	4	82	2
6. Average river flow during release periods	cuft/sec	53133	34000	27067	54567	42192
b. Gaseous Batch Releases						
1. Number of batch releases		14	10	18	16	58
2. Total time period for batch releases	minutes	5975	5525	13403	14083	38986
3. Maximum time period for a batch release	minutes	1980	2712	3195	5844	5844
4. Average time period for batch releases	minutes	427	553	745	880	672
5. Minimum time period for a batch release	minutes	1	29	1	35	1
c. Abnormal Liquid Releases						
1. Number of releases		NONE	NONE	NONE	NONE	NONE
2. Total activity released	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
d. Abnormal Gaseous Releases						
1. Number of releases		1	NONE	NONE	1	2
2. Total activity released	Curies	9.30E-02	0.00E+00	0.00E+00	2.30E-04	9.32E-02

Annual Radioactive Effluent Release Report

Calendar Year - 2006

Table 1A

Gaseous Effluents - Summation Of All Releases

	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year	Total Error, %
A. Fission & Activation Gases							
1. Site Total release	Ci	1.78E-01	3.87E-02	6.64E-01	1.25E+00	2.13E+00	26.5%
1a. Unit 1 Gases	Ci	1.15E-01	1.94E-02	3.42E-01	2.07E-01	6.83E-01	
1b. Unit 2 Gases	Ci	6.30E-02	1.94E-02	3.22E-01	1.05E+00	1.45E+00	
2. Average release rate for period	uCi/sec	2.26E-02	4.91E-03	8.42E-02	1.59E-01	6.77E-02	
3. Percent of applicable limit	%	N/A	N/A	N/A	N/A	N/A	
B. Iodines							
1. Site Total iodine - 131	Ci	0.00E+00	1.62E-07	2.23E-06	3.38E-07	2.73E-06	28.3%
1a. Unit 1 iodine - 131	Ci	0.00E+00	8.10E-08	1.12E-06	1.69E-07	1.37E-06	
1b. Unit 2 iodine - 131	Ci	0.00E+00	8.10E-08	1.12E-06	1.69E-07	1.37E-06	
2. Average release rate for period	uCi/sec	0.00E+00	2.06E-08	2.83E-07	4.29E-08	8.66E-08	
3. Percent of applicable limit	%	N/A	N/A	N/A	N/A	N/A	
C. Particulates							
1. Particulates with half-lives > 8 days	Ci	1.92E-16	0.00E+00	0.00E+00	4.33E-06	4.33E-06	30.0%
1a. Unit 1 Particulates	Ci	1.92E-16	0.00E+00	0.00E+00	0.00E+00	1.92E-16	
1b. Unit 2 Particulates	Ci	0.00E+00	0.00E+00	0.00E+00	4.33E-06	4.33E-06	
2. Average release rate for period	uCi/sec	2.43E-17	0.00E+00	0.00E+00	5.49E-07	1.37E-07	
3. Percent of applicable limit	%	N/A	N/A	N/A	N/A	N/A	
D. Gross Alpha							
1. Site Gross alpha radioactivity	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	30.0%
1a. Unit 1 Gross alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1b. Unit 2 Gross alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of applicable limit	%	N/A	N/A	N/A	N/A	N/A	
E. Tritium							
1. Site Total release	Ci	9.85E+00	6.44E+00	5.72E+00	5.35E+00	2.74E+01	32.9%
1a. Unit 1 Tritium	Ci	6.70E+00	5.13E+00	5.35E+00	4.24E+00	2.14E+01	
1b. Unit 2 Tritium	Ci	3.15E+00	1.31E+00	3.72E-01	1.11E+00	5.94E+00	
2. Average release rate for period	uCi/sec	1.25E+00	8.17E-01	7.26E-01	6.79E-01	8.68E-01	
3. Percent of applicable limit	%	N/A	N/A	N/A	N/A	N/A	

N/A = Not Applicable

The amount of time (in seconds) used to calculate the release rates specified in A.2, B.2, C.2, D.2 and E.2 is the average amount of seconds per calendar quarter (7.88E+06 seconds).

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 1B-EB
Gaseous Effluents - Elevated Batch Releases

Nuclides released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year
1. Fission gases						
argon-41	Ci	1.66E-05	LLD	1.03E-03	1.37E-03	2.41E-03
krypton-85	Ci	7.30E-03	3.87E-02	3.94E-02	6.52E-03	9.19E-02
krypton-85m	Ci	2.14E-05	LLD	1.08E-04	2.88E-05	1.59E-04
krypton-87	Ci	LLD	LLD	LLD	LLD	LLD
krypton-88	Ci	LLD	LLD	LLD	LLD	LLD
xenon-131m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133	Ci	8.93E-02	LLD	5.63E-02	2.34E-03	1.48E-01
xenon-133m	Ci	1.64E-03	LLD	1.18E-03	LLD	2.83E-03
xenon-135	Ci	8.34E-03	LLD	1.31E-02	1.17E-03	2.26E-02
xenon-135m	Ci	3.86E-04	LLD	2.82E-04	9.08E-05	7.58E-04
xenon-138	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	1.07E-01	3.87E-02	1.11E-01	1.15E-02	2.69E-01
2. Iodines						
iodine-131	Ci	LLD	LLD	LLD	LLD	LLD
iodine-133	Ci	LLD	LLD	LLD	LLD	LLD
iodine-135	Ci	LLD	LLD	LLD	LLD	LLD
Total for period	Ci	ND	ND	ND	ND	ND
3. Particulates						
chromium-51	Ci	LLD	LLD	LLD	LLD	LLD
manganese-54	Ci	LLD	LLD	LLD	LLD	LLD
iron-59	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-57	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-58	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-60	Ci	LLD	LLD	LLD	LLD	LLD
zinc-65	Ci	LLD	LLD	LLD	LLD	LLD
strontium-89	Ci	LLD	LLD	LLD	LLD	LLD
strontium-90	Ci	LLD	LLD	LLD	LLD	LLD
molybdenum-99	Ci	LLD	LLD	LLD	LLD	LLD
cesium-134	Ci	LLD	LLD	LLD	LLD	LLD
cesium-137	Ci	LLD	LLD	LLD	LLD	LLD
barium/lanthanum-140	Ci	LLD	LLD	LLD	LLD	LLD
cerium-141	Ci	LLD	LLD	LLD	LLD	LLD
cerium-144	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	ND	ND	ND	ND	ND

LLD = Below the Lower Limit of Detectability, in uCi/cc (Table 4).

ND = None Detected

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 1B-EC
Gaseous Effluents - Elevated Continuous Releases

Nuclides released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year
1. Fission gases						
argon-41	Ci	LLD	LLD	LLD	LLD	LLD
krypton-85	Ci	LLD	LLD	LLD	LLD	LLD
krypton-85m	Ci	LLD	LLD	LLD	LLD	LLD
krypton-87	Ci	LLD	LLD	LLD	LLD	LLD
krypton-88	Ci	LLD	LLD	LLD	LLD	LLD
xenon-131m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133	Ci	1.90E-02	LLD	5.33E-01	LLD	5.52E-01
xenon-133m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-138	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	1.90E-02	ND	5.33E-01	ND	5.52E-01
2. Iodines						
iodine-131	Ci	LLD	1.62E-07	2.23E-06	3.38E-07	2.73E-06
iodine-133	Ci	LLD	LLD	LLD	LLD	LLD
iodine-135	Ci	LLD	LLD	LLD	LLD	LLD
Total for period	Ci	ND	1.62E-07	2.23E-06	3.38E-07	2.73E-06
3. Particulates						
chromium-51	Ci	LLD	LLD	LLD	LLD	LLD
manganese-54	Ci	LLD	LLD	LLD	LLD	LLD
iron-59	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-57	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-58	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-60	Ci	LLD	LLD	LLD	LLD	LLD
zinc-65	Ci	LLD	LLD	LLD	LLD	LLD
strontium-89	Ci	LLD	LLD	LLD	LLD	LLD
strontium-90	Ci	LLD	LLD	LLD	LLD	LLD
molybdenum-99	Ci	LLD	LLD	LLD	LLD	LLD
cesium-134	Ci	LLD	LLD	LLD	LLD	LLD
cesium-137	Ci	LLD	LLD	LLD	LLD	LLD
barium/lanthanum-140	Ci	LLD	LLD	LLD	LLD	LLD
cerium-141	Ci	LLD	LLD	LLD	LLD	LLD
cerium-144	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	ND	ND	ND	ND	ND

LLD = Below the Lower Limit of Detectability, in uCi/cc (Table 4).

ND = None Detected

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 1C-GB1
Gaseous Effluents - Ground Level Batch Releases (Unit 1)

Nuclides released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year
1. Fission gases						
argon-41	Ci	LLD	LLD	LLD	LLD	LLD
krypton-85	Ci	LLD	LLD	LLD	LLD	LLD
krypton-85m	Ci	LLD	LLD	LLD	LLD	LLD
krypton-87	Ci	LLD	LLD	LLD	LLD	LLD
krypton-88	Ci	LLD	LLD	LLD	LLD	LLD
xenon-131m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133	Ci	5.21E-02	LLD	1.95E-02	LLD	7.15E-02
xenon-133m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-138	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	5.21E-02	ND	1.95E-02	ND	7.15E-02
2. Iodines						
iodine-131	Ci	LLD	LLD	LLD	LLD	LLD
iodine-133	Ci	LLD	LLD	LLD	LLD	LLD
iodine-135	Ci	LLD	LLD	LLD	LLD	LLD
Total for period	Ci	ND	ND	ND	ND	ND
3. Particulates						
chromium-51	Ci	LLD	LLD	LLD	LLD	LLD
manganese-54	Ci	LLD	LLD	LLD	LLD	LLD
iron-59	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-57	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-58	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-60	Ci	LLD	LLD	LLD	LLD	LLD
zinc-65	Ci	LLD	LLD	LLD	LLD	LLD
strontium-89	Ci	LLD	LLD	LLD	LLD	LLD
strontium-90	Ci	LLD	LLD	LLD	LLD	LLD
molybdenum-99	Ci	LLD	LLD	LLD	LLD	LLD
cesium-134	Ci	LLD	LLD	LLD	LLD	LLD
cesium-137	Ci	LLD	LLD	LLD	LLD	LLD
barium/lanthanum-140	Ci	LLD	LLD	LLD	LLD	LLD
cerium-141	Ci	LLD	LLD	LLD	LLD	LLD
cerium-144	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	ND	ND	ND	ND	ND

LLD = Below the Lower Limit of Detectability, in uCi/cc (Table 4).

ND = None Detected

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 1C-GC1
Gaseous Effluents - Ground Level Continuous Releases (Unit 1)

Nuclides released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year
1. Fission gases						
argon-41	Ci	LLD	LLD	LLD	LLD	LLD
krypton-85	Ci	LLD	LLD	LLD	LLD	LLD
krypton-85m	Ci	LLD	LLD	LLD	LLD	LLD
krypton-87	Ci	LLD	LLD	LLD	LLD	LLD
krypton-88	Ci	LLD	LLD	LLD	LLD	LLD
xenon-131m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135	Ci	LLD	LLD	LLD	2.01E-01	2.01E-01
xenon-135m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-138	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	ND	ND	ND	2.01E-01	2.01E-01
2. Iodines						
iodine-131	Ci	LLD	LLD	LLD	LLD	LLD
iodine-133	Ci	LLD	LLD	LLD	LLD	LLD
iodine-135	Ci	LLD	LLD	LLD	LLD	LLD
Total for period	Ci	ND	ND	ND	ND	ND
3. Particulates						
chromium-51	Ci	LLD	LLD	LLD	LLD	LLD
manganese-54	Ci	LLD	LLD	LLD	LLD	LLD
iron-59	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-57	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-58	Ci	6.33E-17	LLD	LLD	LLD	6.33E-17
cobalt-60	Ci	3.83E-17	LLD	LLD	LLD	3.83E-17
zinc-65	Ci	4.17E-17	LLD	LLD	LLD	4.17E-17
zirconium/niobium-95	Ci	4.45E-17	LLD	LLD	LLD	4.45E-17
zirconium/niobium-97	Ci	LLD	LLD	LLD	LLD	LLD
molybdenum-99	Ci	LLD	LLD	LLD	LLD	LLD
cesium-134	Ci	LLD	LLD	LLD	LLD	LLD
cesium-137	Ci	3.97E-18	LLD	LLD	LLD	3.97E-18
barium/lanthanum-140	Ci	LLD	LLD	LLD	LLD	LLD
cerium-141	Ci	LLD	LLD	LLD	LLD	LLD
cerium-144	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	1.92E-16	ND	ND	ND	1.92E-16

LLD = Below the Lower Limit of Detectability, in uCi/cc (Table 4).

ND = None Detected

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 1C-GB2
Gaseous Effluents - Ground Level Batch Releases (Unit 2)

Nuclides released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year
1. Fission gases						
argon-41	Ci	LLD	LLD	LLD	LLD	LLD
krypton-85	Ci	LLD	LLD	LLD	LLD	LLD
krypton-85m	Ci	LLD	LLD	LLD	LLD	LLD
krypton-87	Ci	LLD	LLD	LLD	LLD	LLD
krypton-88	Ci	LLD	LLD	LLD	LLD	LLD
xenon-131m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-138	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	ND	ND	ND	ND	ND
2. Iodines						
iodine-131	Ci	LLD	LLD	LLD	LLD	LLD
iodine-133	Ci	LLD	LLD	LLD	LLD	LLD
iodine-135	Ci	LLD	LLD	LLD	LLD	LLD
Total for period	Ci	ND	ND	ND	ND	ND
3. Particulates						
beryllium-7	Ci	LLD	LLD	LLD	LLD	LLD
chromium-51	Ci	LLD	LLD	LLD	LLD	LLD
manganese-54	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-57	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-58	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-60	Ci	LLD	LLD	LLD	LLD	LLD
zinc-65	Ci	LLD	LLD	LLD	LLD	LLD
strontium-89	Ci	LLD	LLD	LLD	LLD	LLD
strontium-90	Ci	LLD	LLD	LLD	LLD	LLD
zirconium/niobium-97	Ci	LLD	LLD	LLD	LLD	LLD
cesium-134	Ci	LLD	LLD	LLD	LLD	LLD
cesium-137	Ci	LLD	LLD	LLD	LLD	LLD
barium/lanthanum-140	Ci	LLD	LLD	LLD	LLD	LLD
cerium-141	Ci	LLD	LLD	LLD	LLD	LLD
cerium-144	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	ND	ND	ND	ND	ND

LLD = Below the Lower Limit of Detectability, in uCi/cc (Table 4).

ND = None Detected

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 1C-GC2
Gaseous Effluents - Ground Level Continuous Releases (Unit 2)

Nuclides released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year
1. Fission gases						
argon-41	Ci	LLD	LLD	LLD	1.04E+00	1.04E+00
krypton-85	Ci	LLD	LLD	LLD	LLD	LLD
krypton-85m	Ci	LLD	LLD	LLD	LLD	LLD
krypton-87	Ci	LLD	LLD	LLD	LLD	LLD
krypton-88	Ci	LLD	LLD	LLD	LLD	LLD
xenon-131m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-138	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	ND	ND	ND	1.04E+00	1.04E+00
2. Iodines						
iodine-131	Ci	LLD	LLD	LLD	LLD	LLD
iodine-133	Ci	LLD	LLD	LLD	LLD	LLD
iodine-135	Ci	LLD	LLD	LLD	LLD	LLD
Total for period	Ci	ND	ND	ND	ND	ND
3. Particulates						
chromium-51	Ci	LLD	LLD	LLD	LLD	LLD
manganese-54	Ci	LLD	LLD	LLD	LLD	LLD
iron-59	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-57	Ci	LLD	LLD	LLD	LLD	LLD
cobalt-58	Ci	LLD	LLD	LLD	4.33E-06	4.33E-06
cobalt-60	Ci	LLD	LLD	LLD	LLD	LLD
zinc-65	Ci	LLD	LLD	LLD	LLD	LLD
strontium-89	Ci	LLD	LLD	LLD	LLD	LLD
strontium-90	Ci	LLD	LLD	LLD	LLD	LLD
zirconium/niobium-95	Ci	LLD	LLD	LLD	LLD	LLD
cesium-134	Ci	LLD	LLD	LLD	LLD	LLD
cesium-137	Ci	LLD	LLD	LLD	LLD	LLD
barium/lanthanum-140	Ci	LLD	LLD	LLD	LLD	LLD
cerium-141	Ci	LLD	LLD	LLD	LLD	LLD
cerium-144	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	ND	ND	ND	4.33E-06	4.33E-06

LLD = Below the Lower Limit of Detectability, in uCi/cc (Table 4).

ND = None Detected

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Table 2A

Liquid Effluents - Summation Of All Releases

	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year	Total Error, %
A. Fission & activation products							
1. Total release (excl. H-3, gas & alpha)	Ci	5.25E-02	7.34E-02	1.02E-01	1.15E-01	3.43E-01	26.1%
2. Average diluted concentration	uCi/ml	8.76E-08	7.15E-08	3.93E-08	7.90E-08	6.04E-08	
3. Percent of applicable limit	%	2.10E+00	2.94E+00	4.08E+00	4.61E+00	3.43E+00	
B. Tritium							
1. Total release	Ci	6.09E+02	3.74E+02	5.98E+02	4.53E+02	2.03E+03	25.0%
2. Average diluted concentration	uCi/ml	1.02E-03	3.64E-04	2.31E-04	3.10E-04	3.58E-04	
3. Percent of applicable limit	%	1.02E+01	3.64E+00	2.31E+00	3.10E+00	3.58E+00	
C. Dissolved and entrained gases							
1. Total release	Ci	2.22E-04	ND	ND	ND	2.22E-04	27.0%
2. Average diluted concentration	uCi/ml	3.71E-10				3.91E-11	
3. Percent of applicable limit	%	1.85E-04				1.95E-05	
D. Gross alpha radioactivity (total release)	Ci	LLD	LLD	LLD	LLD	LLD	28.9%
E. Volume of waste released (prior to dilution)	liters	1.09E+06	1.41E+06	2.74E+06	2.41E+06	7.65E+06	11.2%
F. Volume of dilution water used	liters	5.98E+08	1.03E+09	2.59E+09	1.46E+09	5.67E+09	22.9%

LLD = Below the Lower Limit of Detectability, in uCi/ml (Table 4)

A.3 is based on a historical PA-DEP guide of 10 Ci/yr

B.3 is based on a ODCM limit of 1.00E-2 uCi/ml

C.3 is based on a ODCM limit of 2.00E-04 uCi/ml

The values listed at F. are the volumes during actual liquid waste discharge periods. The total dilution volume for a continuous calendar quarter is approximately 1E+10 liters for BVPS-1 & 2 (ie.; ~ 22,800 gpm is the total dilution flowrate from the site)

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Table 2B-B

Liquid Effluents - Batch Releases

Nuclides released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year
1. Fission and activation products						
beryllium-7	Ci	LLD	LLD	LLD	LLD	LLD
sodium-24	Ci	LLD	LLD	LLD	LLD	LLD
chromium-51	Ci	LLD	1.70E-03	LLD	4.10E-03	5.80E-03
manganese-54	Ci	3.65E-04	1.44E-04	2.44E-04	4.57E-04	1.21E-03
iron-55	Ci	8.26E-03	1.47E-02	3.42E-02	2.42E-02	8.13E-02
iron-59	Ci	4.47E-04	2.69E-04	1.82E-04	3.92E-04	1.29E-03
cobalt-57	Ci	2.99E-05	LLD	9.47E-05	2.79E-04	4.03E-04
cobalt-58	Ci	7.18E-03	1.20E-02	3.40E-03	2.73E-02	4.99E-02
cobalt-60	Ci	8.02E-03	4.95E-03	1.07E-02	7.04E-03	3.07E-02
zinc-65	Ci	3.10E-03	2.93E-03	3.29E-03	7.52E-04	1.01E-02
strontium-89	Ci	LLD	LLD	LLD	LLD	LLD
strontium-90	Ci	LLD	LLD	LLD	LLD	LLD
zirconium/niobium-95	Ci	2.24E-05	6.32E-05	1.86E-04	1.67E-04	4.38E-04
zirconium/niobium-97	Ci	5.55E-05	4.58E-05	5.38E-04	2.46E-05	6.64E-04
molybdenum-99/technetium-99m	Ci	LLD	LLD	LLD	LLD	LLD
tin-113	Ci	LLD	LLD	LLD	LLD	LLD
silver-110m	Ci	1.03E-02	2.90E-03	1.00E-02	4.69E-03	2.79E-02
antimony-122	Ci	LLD	LLD	LLD	LLD	LLD
antimony-124	Ci	1.76E-03	5.56E-03	2.23E-03	3.67E-03	1.32E-02
antimony-125	Ci	1.26E-02	2.81E-02	3.55E-02	4.22E-02	1.18E-01
iodine-131	Ci	LLD	LLD	LLD	LLD	LLD
cesium-134	Ci	3.61E-05	1.21E-05	1.56E-04	1.90E-07	2.04E-04
cesium-137	Ci	2.85E-04	5.61E-05	1.40E-03	2.04E-06	1.74E-03
barium/lanthanum-140	Ci	LLD	LLD	LLD	LLD	LLD
cerium-141	Ci	LLD	LLD	LLD	LLD	LLD
cerium-144	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	5.25E-02	7.34E-02	1.02E-01	1.15E-01	3.43E-01
2. Dissolved and entrained gases						
krypton-85	Ci	LLD	LLD	LLD	LLD	LLD
xenon-133	Ci	2.22E-04	LLD	LLD	LLD	2.22E-04
xenon-133m	Ci	LLD	LLD	LLD	LLD	LLD
xenon-135	Ci	LLD	LLD	LLD	LLD	LLD
unidentified	Ci	NONE	NONE	NONE	NONE	NONE
Total for period	Ci	2.22E-04	ND	ND	ND	2.22E-04

LLD = Below the Lower Limit of Detectability, in uCi/ml (Table 4)

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Table 2B-C

Liquid Effluents - Continuous Releases

Nuclides released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Calendar Year
1. Fission and activation products						
beryllium-7	Ci	N/A	N/A	N/A	N/A	N/A
sodium-24	Ci	N/A	N/A	N/A	N/A	N/A
chromium-51	Ci	N/A	N/A	N/A	N/A	N/A
manganese-54	Ci	N/A	N/A	N/A	N/A	N/A
iron-55	Ci	N/A	N/A	N/A	N/A	N/A
iron-59	Ci	N/A	N/A	N/A	N/A	N/A
cobalt-57	Ci	N/A	N/A	N/A	N/A	N/A
cobalt-58	Ci	N/A	N/A	N/A	N/A	N/A
cobalt-60	Ci	N/A	N/A	N/A	N/A	N/A
zinc-65	Ci	N/A	N/A	N/A	N/A	N/A
strontium-89	Ci	N/A	N/A	N/A	N/A	N/A
strontium-90	Ci	N/A	N/A	N/A	N/A	N/A
zirconium/niobium-95	Ci	N/A	N/A	N/A	N/A	N/A
zirconium/niobium-97	Ci	N/A	N/A	N/A	N/A	N/A
molybdenum-99	Ci	N/A	N/A	N/A	N/A	N/A
technetium-99m	Ci	N/A	N/A	N/A	N/A	N/A
ruthenium-103	Ci	N/A	N/A	N/A	N/A	N/A
silver-110m	Ci	N/A	N/A	N/A	N/A	N/A
antimony-124	Ci	N/A	N/A	N/A	N/A	N/A
antimony-125	Ci	N/A	N/A	N/A	N/A	N/A
iodine-131	Ci	N/A	N/A	N/A	N/A	N/A
iodine-133	Ci	N/A	N/A	N/A	N/A	N/A
cesium-134	Ci	N/A	N/A	N/A	N/A	N/A
cesium-137	Ci	N/A	N/A	N/A	N/A	N/A
barium/lanthanum-140	Ci	N/A	N/A	N/A	N/A	N/A
cerium-141	Ci	N/A	N/A	N/A	N/A	N/A
cerium-144	Ci	N/A	N/A	N/A	N/A	N/A
unidentified	Ci	N/A	N/A	N/A	N/A	N/A
Total for period	Ci	N/A	N/A	N/A	N/A	N/A
2. Dissolved and entrained gases						
argon-41	Ci	N/A	N/A	N/A	N/A	N/A
xenon-133	Ci	N/A	N/A	N/A	N/A	N/A
xenon-133m	Ci	N/A	N/A	N/A	N/A	N/A
xenon-135	Ci	N/A	N/A	N/A	N/A	N/A
unidentified	Ci	N/A	N/A	N/A	N/A	N/A
Total for period	Ci	N/A	N/A	N/A	N/A	N/A

N/A = Not Applicable (liquids not discharged in a continuous mode during this period)

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Table 3A

Solid Waste And Irradiated Fuel Shipments (Part 1 of 3)

A. Solid Waste Shipped Offsite For Burial Or Disposal (Not irradiated fuel)				
1. Type of Waste (Spent resins, Filter Sludges, Evaporator Bottoms, Oil)		1st Half	2nd Half	Estimated Total Error
a. Volume Shipped		1.95E+01 m3	1.83E+01 m3	0.0% (1)
b. Volume Buried		0.00E+00 m3	0.00E+00 m3	0.0% (1)
c. Total Activity		2.56E+00 Ci	7.59E+01 Ci	30.0%
2. Estimate of Major Nuclide Composition by Type of Waste On This Table (2)		Percent (%)	Percent (%)	
H-3		1.03 %	0.16 %	
Be-7		0.00 %	6.33 %	
C-14		0.42 %	0.51 %	
Cr-51		1.19 %	0.75 %	
Mn-54		1.27 %	3.54 %	
Fe-55		30.50 %	17.60 %	
Co-57		0.19 %	0.54 %	
Co-58		19.50 %	25.50 %	
Fe-59		0.00 %	0.09 %	
Ni-59		0.05 %	0.16 %	
Co-60		10.90 %	15.70 %	
Ni-63		9.36 %	22.00 %	
Zn-65		5.93 %	2.86 %	
Nb-95		1.77 %	1.20 %	
Zr-95		0.84 %	0.80 %	
Ru-106		2.56 %	0.02 %	
Ag-110m		12.10 %	0.18 %	
Sn-113		0.00 %	0.24 %	
Sn-117m		0.01 %	0.01 %	
Sb-124		0.00 %	0.02 %	
Sb-125		1.09 %	0.15 %	
I-131		0.00 %	0.04 %	
Cs-134		0.02 %	0.35 %	
Cs-137		0.59 %	1.02 %	
Ce-144/Pr-144		0.68 %	0.03 %	
Pu-241		0.02 %	0.09 %	
3. Number of Shipments		6	9	
a. Type of Container Used	LSA	6	9	
	Type A	0	0	
	Type B	0	0	
	Large Quantity	0	0	
b. Solidification Agent Used	Cement	0	0	
	Urea Formaldehyde	0	0	
	None	6	9	
c. Mode of Transport	Truck	6	9	
	Rail	0	0	
d. Final Destination	Erwin, TN	1	3	
	Oak Ridge, TN	5	6	
e. Waste Class per 10 CFR Part 61	Class A	6	4	
	Class B	0	1	
	Class C	0	1	
	> Class C	0	3	

(1) Since container volumes are provided by the burial site, a calculational error of zero is assumed.
(2) Percent values for any nuclide that are <0.01 % are not shown on this table. Data is available upon request.

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Table 3B
Solid Waste And Irradiated Fuel Shipments (Part 2 of 3)

A. Solid Waste Shipped Offsite For Burial Or Disposal (Not irradiated fuel)				
1. Type of Waste (Dry Compressible Waste, Contaminated Equipment, etc.)		1st Half	2nd Half	Estimated Total Error
a. Volume Shipped		2.29E+03 m3	8.68E+02 m3	0.0% (1)
b. Volume Buried		8.07E+01 m3	2.08E+02 m3	0.0% (1)
c. Total Activity		5.99E+00 Ci	5.27E-01 Ci	30.0%
2. Estimate of Major Nuclide Composition by Type of Waste On This Table (2)		Percent (%)	Percent (%)	
H-3		0.55 %	0.90 %	
C-14		0.31 %	0.44 %	
Cr-51		0.52 %	8.64 %	
Mn-54		1.62 %	0.68 %	
Fe-55		41.10 %	13.30 %	
Co-57		0.07 %	0.02 %	
Co-58		7.66 %	26.50 %	
Fe-59		0.27 %	6.51 %	
Co-60		16.20 %	10.30 %	
Ni-59		0.17 %	0.16 %	
Ni-63		10.20 %	9.67 %	
Zn-65		10.80 %	2.72 %	
Sr-90		0.02 %	0.05 %	
Nb-95		1.20 %	2.86 %	
Zr-95		1.77 %	1.64 %	
Tc-99		0.03 %	0.04 %	
Ru-103		0.01 %	0.00 %	
Ag-110m		0.02 %	0.00 %	
Sn-113		0.14 %	0.00 %	
Sb-124		0.01 %	0.15 %	
Sb-125		0.81 %	0.68 %	
I-129		0.01 %	0.03 %	
Cs-134		1.15 %	2.37 %	
Cs-137		5.27 %	12.10 %	
Ce-144/Pr-144		0.07 %	0.00 %	
Pu-241		0.11 %	0.16 %	
3. Number of Shipments		46	18	
a. Type of Container Used	LSA	46	18	
	Type A	0	0	
	Type B	0	0	
	Large Quantity	0	0	
b. Solidification Agent Used	Cement	0	0	
	Urea Formaldehyde	0	0	
	None	46	18	
c. Mode of Transport	Truck	46	18	
	Rail	0	0	
	Other	0	0	
d. Final Destination	Oak Ridge, TN	46	18	
	Wampum, PA	0	0	
e. Waste Class per 10 CFR Part 61	Class A	46	18	
	Class B	0	0	
	Class C	0	0	
	> Class C	0	0	

(1) Since container volumes are provided by the burial site, a calculational error of zero is assumed.
(2) Percent values for any nuclide that are <0.01 % are not shown on this table. Data is available upon request.

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Table 3C
Solid Waste And Irradiated Fuel Shipments (Part 3 of 3)

A. Solid Waste Shipped Offsite For Burial Or Disposal (Not irradiated fuel)				
1. Type of Waste (Irradiated components, Control Rods, etc)		1st Half	2nd Half	Estimated Total Error
a. Volume Shipped		0.00E+00 m3	6.37E-01 m3	0.0% (1)
b. Volume Buried		0.00E+00 m3	0.00E+00 m3	0.0% (1)
c. Total Activity		0.00E+00 Ci	1.20E-02 Ci	30.0%
2. Estimate of Major Nuclide Composition by Type of Waste On This Table (2)		Percent (%)	Percent (%)	
H-3		0.00 %	1.54 %	
C-14		0.00 %	0.88 %	
Mn-54		0.00 %	1.05 %	
Fe-55		0.00 %	18.90 %	
Co-58		0.00 %	41.40 %	
Ni-59		0.00 %	0.20 %	
Co-60		0.00 %	13.10 %	
Ni-63		0.00 %	9.99 %	
Zn-65		0.00 %	0.40 %	
Sr-90		0.00 %	0.03 %	
Tc-99		0.00 %	0.03 %	
I-129		0.00 %	0.06 %	
Cs-134		0.00 %	2.97 %	
Cs-137		0.00 %	9.33 %	
Pu-241		0.00 %	0.18 %	
3. Number of Shipments		0	1	
a. Type of Container Used	LSA	0	1	
	Type A	0	0	
	Type B	0	0	
	Large Quantity	0	0	
b. Solidification Agent Used	Cement	0	0	
	Urea Formaldehyde	0	0	
	None	0	1	
c. Mode of Transport	Truck	0	1	
	Rail	0	0	
	Other	0	0	
d. Final Destination	Barnwell, SC	0	0	
	Oak Ridge, TN	0	1	
e. Waste Class per 10 CFR Part 61	Class A	0	1	
	Class B	0	0	
	Class C	0	0	
	> Class C	0	0	
B. No Irradiated Fuel Shipments				

(1) Since container volumes are provided by the burial site, a calculational error of zero is assumed.
(2) Percent values for any nuclide that are <0.01 % are not shown on this table. Data is available upon request.

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Table 4
Lower Limits Of Detectability (LLD)

	RWDA-G 1000 cc Gas Grab Sample		RWDA-L 1000 ml Liquid Grab Sample		Filter Paper / Charcoal Continuous Effluent Sample	
Nuclide	(3) Calculated LLD (uCi/cc)	ODCM Required LLD (uCi/cc)	(3) Calculated LLD (uCi/ml)	ODCM Required LLD (uCi/ml)	(3) Calculated (2) LLD (uCi/cc)	ODCM Required LLD (uCi/cc)
H-3	(4) 1.00E-06	1E-06	1.00E-06	1E-05	-------	-----
Na-24	9.77E-08	1E-04	2.21E-08	5E-07	1.71E-13	1E-11
Ar-41	6.61E-08	1E-04	1.50E-08	5E-07	-------	-----
Cr-51	4.99E-07	1E-04	1.28E-07	5E-07	8.01E-13	1E-11
Mn-54	1.32E-07	1E-04	3.02E-08	5E-07	7.51E-14	1E-11
Fe-55	-------	-----	(1) 1.00E-06	1E-06	-------	-----
Fe-59	1.00E-07	1E-04	2.28E-08	5E-07	1.73E-13	1E-11
Co-57	3.42E-08	1E-04	1.07E-08	5E-07	4.02E-14	1E-11
Co-58	8.61E-08	1E-04	1.97E-08	5E-07	7.34E-14	1E-11
Co-60	8.48E-08	1E-04	1.93E-08	5E-07	1.47E-13	1E-11
Zn-65	1.99E-07	1E-04	4.55E-08	5E-07	5.46E-14	1E-11
Kr-85	2.06E-05	1E-04	4.89E-06	1E-05	-------	-----
Kr-85m	4.33E-08	1E-04	1.30E-08	1E-05	-------	-----
Kr-87	1.08E-07	1E-04	2.67E-08	1E-05	-------	-----
Kr-88	1.43E-07	1E-04	4.07E-08	1E-05	-------	-----
Sr-89	-------	-----	(1) 5.00E-08	5E-08	(1) 1.00E-13	1E-11
Sr-90	-------	-----	(1) 5.00E-08	5E-08	(1) 1.00E-14	1E-11
Sr-92	2.45E-08	1E-04	5.54E-09	5E-07	4.29E-14	1E-11
Nb-95	8.11E-08	1E-04	1.86E-08	5E-07	2.18E-14	1E-11
Nb-97	1.12E-08	1E-04	2.60E-09	5E-07	8.49E-14	1E-11
Zr-95	1.25E-07	1E-04	2.88E-08	5E-07	3.89E-14	1E-11
Mo-99	3.84E-08	1E-04	1.17E-08	5E-07	3.79E-14	1E-11
Tc-99m	3.74E-08	1E-04	1.14E-08	5E-07	3.70E-14	1E-11
Ag-110m	1.17E-08	1E-04	2.70E-09	5E-07	8.82E-14	1E-11
Sb-124	8.59E-08	1E-04	2.00E-08	5E-07	5.48E-14	1E-11
Sb-125	1.96E-07	1E-04	4.78E-08	5E-07	3.54E-13	1E-11
I-131	5.44E-08	1E-04	1.37E-08	1E-06	3.99E-14	1E-12
I-133	7.17E-08	1E-04	1.69E-08	5E-07	8.19E-14	1E-10
I-135	3.17E-07	1E-04	7.19E-08	5E-07	4.21E-13	1E-11
Xe-131m	1.70E-06	1E-04	5.02E-07	1E-05	-------	-----
Xe-133	1.06E-07	1E-04	3.71E-08	1E-05	-------	-----
Xe-133m	4.51E-07	1E-04	1.24E-07	1E-05	-------	-----
Xe-135	3.70E-08	1E-04	1.00E-08	1E-05	-------	-----
Xe-135m	8.31E-08	1E-04	1.96E-08	1E-05	-------	-----
Xe-137	1.84E-07	1E-04	4.45E-08	1E-05	-------	-----
Xe-138	1.23E-07	1E-04	3.30E-08	1E-05	-------	-----
Cs-134	7.31E-08	1E-04	1.70E-08	5E-07	5.52E-14	1E-11
Cs-137	9.20E-08	1E-04	2.13E-08	5E-07	9.84E-14	1E-11
Ba-139	1.92E-07	1E-04	5.64E-08	5E-07	2.64E-13	1E-11
Ba-140	1.95E-07	1E-04	4.59E-08	5E-07	1.90E-13	1E-11
La-140	8.43E-08	1E-04	1.87E-08	5E-07	4.65E-14	1E-11
Ce-141	6.79E-08	1E-04	2.05E-08	5E-07	9.91E-14	1E-11
Ce-144	3.62E-07	1E-04	1.11E-07	5E-07	2.45E-13	1E-11
Gross Alpha	-------	-----	(1) 1.00E-07	1E-07	(1) 3.51E-15	1E-11

(1) Sample analyses performed by a contractor laboratory.

(2) These LLD calculations contain a default weekly continuous sample volume of 2.85E+8 cc. Therefore, grab sample LLD values reflect a different volume (ie; 10 cuft or 2.83E+5 cc).

(3) The calculated LLD's, except those denoted by (1), are from a counter/detector calibration on 07/17/06. These values are typical for other counter/detectors used for effluent counting at BVPS.

(4) Based on counting 50 ml of the water that was bubbled through a 20 liter air sample.

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 5A
Assessment Of Radiation Doses

		Unit 1 Liquid Effluents									
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Calendar Year	
	Batch Releases	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit
	Bone	8.23E-03	0.1646	3.35E-03	0.0670	1.72E-02	0.3430	1.41E-03	0.0282	3.01E-02	0.3014
O	Liver	2.31E-02	0.4618	1.32E-02	0.2630	3.29E-02	0.6570	9.64E-03	0.1927	7.87E-02	0.7873
R	Total Body	1.55E-02	1.0333	8.84E-03	0.5893	2.24E-02	1.4933	7.94E-03	0.5293	5.47E-02	1.8227
G	Thyroid	6.00E-03	0.1200	4.56E-03	0.0912	4.74E-03	0.0948	6.18E-03	0.1236	2.15E-02	0.2148
A	Kidney	1.48E-02	0.2960	9.73E-03	0.1946	1.62E-02	0.3240	7.98E-03	0.1596	4.87E-02	0.4871
N	Lung	6.93E-03	0.1386	4.82E-03	0.0964	1.07E-02	0.2140	6.42E-03	0.1284	2.89E-02	0.2887
(1)	GI-LLI	1.49E-02	0.2970	1.11E-02	0.2220	1.11E-02	0.2220	1.26E-02	0.2510	4.96E-02	0.4960

		Unit 1 Gaseous Effluents									
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Calendar Year	
	Batch & Continuous Releases	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit
(2)	Gamma Air	6.03E-05	0.0012	1.44E-09	0.0000	2.32E-06	0.0000	2.71E-04	0.0054	3.34E-04	0.0033
(2)	Beta Air	1.78E-04	0.0018	8.36E-10	0.0000	1.23E-08	0.0000	8.07E-04	0.0081	9.85E-04	0.0049
	Bone	0.00E+00	0.0000	1.42E-04	0.0019	2.82E-09	0.0000	1.14E-09	0.0000	1.42E-04	0.0009
O	Liver	1.09E-01	1.4533	1.52E-01	2.0267	5.74E-02	0.7653	3.33E-02	0.4440	3.52E-01	2.3447
R	Total Body	1.09E-01	1.4533	1.48E-01	1.9733	5.74E-02	0.7653	3.33E-02	0.4440	3.48E-01	2.3180
G	Thyroid	1.09E-01	1.4533	1.48E-01	1.9733	5.74E-02	0.7653	3.33E-02	0.4440	3.48E-01	2.3180
A	Kidney	1.09E-01	1.4533	1.48E-01	1.9733	5.74E-02	0.7653	3.33E-02	0.4440	3.48E-01	2.3180
N	Lung	1.09E-01	1.4533	1.48E-01	1.9733	5.74E-02	0.7653	3.33E-02	0.4440	3.48E-01	2.3180
(3)	GI-LLI	1.09E-01	1.4533	1.48E-01	1.9733	5.74E-02	0.7653	3.33E-02	0.4440	3.48E-01	2.3180

(1) These doses are listed in mrem; they are calculated for the maximum individual for all batch liquid effluents

(2) These doses are listed in mrad; they are calculated at the site boundary for batch & continuous gaseous effluents (0.4 miles NW)

(3) These doses are listed in mrem; they are calculated for the most likely exposed real individual (child) via all real pathways at 0.89 miles NW.

Limits used for calculation of percent (%) are from ODCM procedure 1/2-ODC-3.03, Attachment H Control 3.11.1.2, Attachment L Control 3.11.2.2, and Attachment M Control 3.11.2.3 (considered to be the design objectives).

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 5B
Assessment Of Radiation Doses

		Unit 2 Liquid Effluents									
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Calendar Year	
	Batch Releases	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit
	Bone	8.23E-03	0.1646	3.35E-03	0.0670	1.72E-02	0.3430	1.41E-03	0.0282	3.01E-02	0.3014
O	Liver	2.31E-02	0.4618	1.32E-02	0.2630	3.29E-02	0.6570	9.64E-03	0.1927	7.87E-02	0.7873
R	Total Body	1.55E-02	1.0333	8.84E-03	0.5893	2.24E-02	1.4933	7.94E-03	0.5293	5.47E-02	1.8227
G	Thyroid	6.00E-03	0.1200	4.56E-03	0.0912	4.74E-03	0.0948	6.18E-03	0.1236	2.15E-02	0.2148
A	Kidney	1.48E-02	0.2960	9.73E-03	0.1946	1.62E-02	0.3240	7.98E-03	0.1596	4.87E-02	0.4871
N	Lung	6.93E-03	0.1386	4.82E-03	0.0964	1.07E-02	0.2140	6.42E-03	0.1284	2.89E-02	0.2887
(1)	GI-LLI	1.49E-02	0.2970	1.11E-02	0.2220	1.11E-02	0.2220	1.26E-02	0.2510	4.96E-02	0.4960

		Unit 2 Gaseous Effluents									
		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Calendar Year	
	Batch & Continuous Releases	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit
(2)	Gamma Air	3.21E-07	0.0000	1.44E-09	0.0000	2.32E-06	0.0000	4.39E-08	0.0000	2.69E-06	0.0000
(2)	Beta Air	1.78E-09	0.0000	8.36E-10	0.0000	1.23E-08	0.0000	2.52E-10	0.0000	1.52E-08	0.0000
	Bone	0.00E+00	0.0000	0.00E+00	0.0000	2.82E-09	0.0000	9.75E-07	0.0000	9.78E-07	0.0000
O	Liver	1.60E-02	0.2133	2.54E-02	0.3393	9.51E-03	0.1268	1.01E-02	0.1347	6.11E-02	0.4070
R	Total Body	1.60E-02	0.2133	2.54E-02	0.3393	9.51E-03	0.1268	1.01E-02	0.1347	6.11E-02	0.4070
G	Thyroid	1.60E-02	0.2133	2.54E-02	0.3393	9.52E-03	0.1269	1.01E-02	0.1347	6.11E-02	0.4071
A	Kidney	1.60E-02	0.2133	2.54E-02	0.3393	9.51E-03	0.1268	1.01E-02	0.1347	6.11E-02	0.4070
N	Lung	1.60E-02	0.2133	2.54E-02	0.3393	9.51E-03	0.1268	1.01E-02	0.1347	6.11E-02	0.4070
(3)	GI-LLI	1.60E-02	0.2133	2.54E-02	0.3393	9.51E-03	0.1268	1.01E-02	0.1347	6.11E-02	0.4070

(1) These doses are listed in mrem; they are calculated for the maximum individual for all batch liquid effluents

(2) These doses are listed in mrad; they are calculated at the site boundary for batch & continuous gaseous effluents (0.4 miles NW)

(3) These doses are listed in mrem; they are calculated for the most likely exposed real individual (child) via all real pathways at 0.89 miles NW.

Limits used for calculation of percent (%) are from ODCM procedure 1/2-ODC-3.03, Attachment H Control 3.11.1.2, Attachment L Control 3.11.2.2, and Attachment M Control 3.11.2.3 (considered to be the design objectives).

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 6

Effluent Monitoring Instrumentation Channels Not Returned To Operable Status Within 30 Days
[FR-1LW-103] - Unit 1 Liquid Waste Contaminated Drain Line Flow Rate Measurement Device During performance of the eighteen (18) month calibration of this monitor on August 29, 2006, the output of the transmitter did not meet the Acceptance Criteria of surveillance procedure 1MSP-17.05. Further work on the transmitter was not successful, and it was determined that transmitter needed replaced with an upgraded model. The thirty (30) day criteria was exceeded due to availability of an upgraded model from the vendor. The upgraded transmitter was installed, calibrated and returned to Operable status on October 16, 2006. This condition and associated Corrective Actions are detailed in BVPS Condition Report No. CR06-05181, and BVPS-SAP Order Numbers 200168331, 200223880, and 200197646-0180. As required by ODCM procedure 1/2-ODC-3.03, "Controls for RETS and REMP Programs", (as referenced in procedure Attachment E, Control 3.3.3.9, Table 3.3-12, Action 25), the flow rate shall be estimated every four (4) hours during batch liquid effluent releases through this pathway. However, SINCE there were no liquid effluent releases through the Liquid Waste Contaminated Drain Line (during the affected period), THEN there was no applicability to estimate discharge flowrate.

Annual Radioactive Effluent Release Report

Calendar Year - 2006

Table 7

Total Dose Commitments, Total Effective Dose Equivalents and Population Doses

Total Dose Commitment From All Facility Releases To Members of the Public 40 CFR 190.10(a) Environmental Doses				
Organ	(1) Effluent Dose (mrem)	(2) Direct Radiation Dose (mrem)	Total Dose (mrem)	% of ODCM or 40 CFR 190 Limit
Bone	6.05E-02	6.00E-01	6.61E-01	2.64%
Liver	5.70E-01	6.00E-01	1.17E+00	4.68%
Total Body	5.18E-01	6.00E-01	1.12E+00	4.47%
Thyroid	4.52E-01	6.00E-01	1.05E+00	1.40%
Kidney	5.06E-01	6.00E-01	1.11E+00	4.42%
Lung	4.66E-01	6.00E-01	1.07E+00	4.26%
GI-LLI	5.08E-01	6.00E-01	1.11E+00	4.43%

(1) The cumulative dose contributions from liquid and gaseous effluents were determined in accordance with the applicable CONTROLS & SURVEILLANCE REQUIREMENTS listed in ODCM procedure 1/2-ODC-3.03. The dose commitment limits for 40 CFR 190 MEMBERS OF THE PUBLIC (ODCM 1/2-ODC-3.03 Control 3.11.4.1) are as follows:
a) < or = 25 mrem / calendar year (for the total body, or any organ except the thyroid)
b) < or = 75 mrem / calendar year (for the thyroid)

(2) The dose contribution listed for the total body is for Direct Radiation. This was calculated by comparing offsite TLD exposure at the ODCM controlling location (0.8 miles NW; Midland, PA) to TLD exposure at the REMP control location (16.5 miles SSW; Weirton, WV).

Compliance to 100 mrem Limit of 10 CFR 20.1301 For Total Effective Dose Equivalent

Pursuant to 10 CFR 20.1301(a)(1), the Total Effective Dose Equivalent from licensed operation to the maximum individual during the report period, is 3.44 mrem. This is a summation of Direct Radiation Exposure (calculated by comparing the maximum of all perimeter TLD exposures to TLD exposure at the REMP control location) plus Effluent Doses (calculated per the ODCM).

Members of the Public Doses Due To Their Activities Inside The Site Boundary

The radiation doses for MEMBER(S) OF THE PUBLIC due to their activities inside the site boundary are not greater than the doses listed in this table to show compliance with 40 CFR Part 190 or 10 CFR 20.1301. Evaluations have shown that exposure time for individuals not occupationally associated with the plant site is minimal in comparison to the exposure time considered for the dose calculation at or beyond the site boundary. Therefore, a separate assessment of radiation doses from radioactive effluents to MEMBER(S) OF THE PUBLIC, due to their activities inside the site boundary, is not necessary for this report period.

0-50 Mile Population Doses From Liquid and Gaseous Effluents

0-50 mile Total Population Dose from liquid and gaseous effluents =	655	man-mrem (Total Body)
0-50 mile Average Population Dose from liquid and gaseous effluents =	0.0001638	man-mrem (Total Body)

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Table 8

Offsite Dose Calculation Manual Surveillance Deficiencies

Missing Liquid Waste Composite Sample

The following information is provided to describe a surveillance deficiency of ODCM procedure 1/2-ODC-3.03, "Controls for RETS and REMP Programs", (as referenced in procedure Attachment G, Surveillance Requirement 4.11.1.1.1, Table 4.11-1):

The Liquid Waste sample from RWDA-L-5184 (i.e.; Unit 2 Steam Generator Test Tank [2SGC-TK23B]) that was discharged on December 6, 2006), was not available for addition to the Monthly and Quarterly composite sample volumes, because the sample bottle for RWDA-L-5183 was not correctly re-labeled to denote that it was actually used for generation of RWDA-L-5184. In summary, the sample volume was discarded, because it was assumed to be for a "Voided" RWDA-L.

In an effort to quantify the missing sample, a composite of RWDA-L-5184 was generated using one-half (1/2) of the composite volume from the previous [2SGC-TK23A/23B] discharge, along with one-half (1/2) of the composite volume from the following [2SGC-TK23A/23B] discharge. Specifically, SINCE the discharge volume from RWDA-L-5184 (14,089 gallons) required an aliquot (composite volume) of 141 ml, THEN an aliquot volume of 70.5 ml was obtained from the RWDA-L-5181 sample, and an aliquot volume of 70.5 ml was obtained from the RWDA-L-5186 sample. This method (as used to quantify the missing sample) was appropriate because the total particulate concentration of the three (3) RWDA-L's were similar.

Reporting of ODCM Surveillance Deficiencies in the Annual RETS Report is required by ODCM procedure 1/2-ODC-3.03, "Controls for RETS and REMP Programs", (as referenced in procedure Attachment U, Control 6.9.3). This condition and associated Corrective Actions are documented in BVPS Condition Repot No. CR07-12513, and BVPS-SAP Order No. 200197646-200.

Annual Radioactive Effluent Release Report

Calendar Year - 2006

Table 9

Unit 1 and 2 Offsite Dose Calculation Manual Changes (Description)

There were two changes made to ODCM during the report period. See ODCM procedure 1/2-ODC-1.01, "Index, Matrix and History of ODCM Changes" for a complete description of the changes, and the change justifications. A brief description of the changes are as follows:

Change (22) to the ODCM (Effective August 2006)

1) Procedure 1/2-ODC-1.01, "ODCM: Index, Matrix and History of ODCM Changes"
Updated the History of ODCM Changes to include this change.

2) Procedure 1/2-ODC-2.01, "ODCM: Liquid Effluents"
Incorporated revised references for the upgrade to "Standard Technical Specifications". Revised the alarm setpoints for [RM-1RW-100] and [RM-1DA-100] to reflect the Extended Power Uprate at Unit 1 per Technical Specification Amendment 275. Updated the Figure of Liquid Effluent Release Points.

3) Procedure 1/2-ODC-2.02, "ODCM: Gaseous Effluents"
Revised the alarm setpoints for the low range noble gas effluent monitors to include a "less than or equal to" designation to reflect the Extended Power Uprate at Unit 1 per Technical Specification Amendment 275. Incorporated editorial changes with regards to owner of RETS Program.

4) Procedure 1/2-ODC-3.03, "ODCM: Controls for RETS and REMP Programs"
Revised the alarm setpoints for the mid range and high range noble gas effluent monitors to reflect the Extended Power Uprate at Unit 1 per Technical Specification Amendment 275.

Change (23) to the ODCM (Effective December 2006)

1) Procedure 1/2-ODC-1.01, "ODCM: Index, Matrix and History of ODCM Changes"
Incorporated revised references for the upgrade to "Standard Technical Specifications". Updated the "ODCM procedure Matrix" for performance of Channel Functional Tests. Incorporated editorial changes. Updated the "History of ODCM Changes" to include this change.

2) Procedure 1/2-ODC-2.01, "ODCM: Liquid Effluents"
Revised the alarm setpoints for [2SWS-RQ101] to reflect the Extended Power Uprate at Unit 2 per Technical Specification Amendment 156.

3) Procedure 1/2-ODC-2.03, "ODCM: Radiological Environmental Monitoring Program"
Updated the existing REMP sampling locations with the most recent survey results using a Global Positioning Satellite System. Incorporated editorial changes with regards to owner of REMP Program.

4) Procedure 1/2-ODC-2.04, "ODCM: Information Related to 40 CFR 190"
Incorporated editorial changes with regards to owner of RETS Program.

5) Procedure 1/2-ODC-3.01, "ODCM: Dispersion Calculation Procedure and Source Term Inputs"
Incorporated editorial changes with regards to owner of RETS Program.

6) Procedure 1/2-ODC-3.02, "ODCM: Bases for ODCM Controls"
Incorporated editorial changes with regards to owner of RETS and REMP Programs.

Beaver Valley Power Station - Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Attachment 1
Joint Frequency Distribution Tables

Attachment 1
An annual summary of hourly meteorological data, in the form of joint frequency distribution, is provided for the calendar year as specified in the ODCM. In summary, the joint frequency distribution data is similar to previous years. There has been a minor shift from unstable conditions toward neutral conditions during 2006. This is most likely due to the larger than normal number of rainy days during 2006.

Attachment 1 Clarification
Hourly meteorological data is not provided for specific periods of Abnormal Gaseous Release during the calendar quarters (as indicated in Regulatory Guide 1.21), for the following reasons: 1) All Gaseous Releases (i.e.; Routine and Abnormal) for the calendar year were determined to be within design objectives, where as, the ODCM Dose and Dose Rate Limits are considered to be the design objectives. 2) Although there was one (1) Abnormal Gaseous Releases during the calendar year, the release activity (0.93 Curies of noble gas) was insignificant in regards to total noble gas release activity, and offsite dose contribution. For a copy of the hourly meteorological data during the calendar quarters, contact Mr. Anthony T. Lonnett at 724-682-7523.

Beaver Valley Power Station – Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year – 2006
Attachment 1

Part 1: Joint Frequency Distribution Tables (35ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP35P **Direction:** DI35P **Lapse:** DT150-35
Stability Class A Delta Temperature Extremely Unstable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	4	16	0	0	0	0	20
NNE	9	21	0	0	0	0	30
NE	10	10	0	0	0	0	20
ENE	12	28	0	0	0	0	40
E	4	13	0	0	0	0	17
ESE	6	15	0	0	0	0	21
SE	6	11	0	0	0	0	17
SSE	6	4	0	0	0	0	10
S	1	8	0	0	0	0	9
SSW	1	10	0	0	0	0	11
SW	2	20	7	1	0	0	30
WSW	1	11	7	2	0	0	21
W	1	37	10	0	0	0	48
WNW	4	17	10	0	0	0	31
NW	5	15	3	0	0	0	23
NNW	7	18	0	0	0	0	25
Total	79	254	37	3	0	0	373

Number of Calm Hours for this Table	19
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	373
Total Hours for the Period	8760

Beaver Valley Power Station – Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year – 2006
Attachment 1

Part 1: Joint Frequency Distribution Tables (35ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP35P **Direction:** DI35P **Lapse:** DT150-35
Stability Class B Delta Temperature Moderately Unstable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	2	6	0	0	0	0	8
NNE	2	5	0	0	0	0	7
NE	3	4	0	0	0	0	7
ENE	4	2	0	0	0	0	6
E	1	2	0	0	0	0	3
ESE	0	0	0	0	0	0	0
SE	1	0	0	0	0	0	1
SSE	1	5	0	0	0	0	6
S	2	7	0	0	0	0	9
SSW	2	3	0	0	0	0	5
SW	0	6	2	0	0	0	8
WSW	1	7	6	0	0	0	14
W	1	18	6	0	0	0	25
WNW	1	14	3	0	0	0	18
NW	1	8	2	0	0	0	11
NNW	2	6	0	0	0	0	8
Total	24	93	19	0	0	0	136

Number of Calm Hours for this Table	19
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	136
Total Hours for the Period	8760

Beaver Valley Power Station – Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year – 2006
Attachment 1

Part 1: Joint Frequency Distribution Tables (35ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP35P **Direction:** DI35P **Lapse:** DT150-35
Stability Class C Delta Temperature Slightly Unstable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	3	8	0	0	0	0	11
NNE	3	4	0	0	0	0	7
NE	4	1	0	0	0	0	5
ENE	3	3	0	0	0	0	6
E	4	1	0	0	0	0	5
ESE	1	0	0	0	0	0	1
SE	2	0	0	0	0	0	2
SSE	1	1	0	0	0	0	2
S	0	4	0	0	0	0	4
SSW	0	5	2	0	0	0	7
SW	0	8	7	0	0	0	15
WSW	1	19	5	1	0	0	26
W	3	29	7	0	0	0	39
WNW	3	25	3	0	0	0	31
NW	3	11	0	0	0	0	14
NNW	4	3	0	0	0	0	7
Total	35	122	24	1	0	0	182

Number of Calm Hours for this Table	19
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	182
Total Hours for the Period	8760

Beaver Valley Power Station – Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year – 2006
Attachment 1

Part 1: Joint Frequency Distribution Tables (35ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP35P **Direction:** DI35P **Lapse:** DT150-35
Stability Class D Delta Temperature Neutral

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	60	77	0	0	0	0	137
NNE	64	20	0	0	0	0	84
NE	70	5	0	0	0	0	75
ENE	70	24	0	0	0	0	94
E	16	12	0	0	0	0	28
ESE	19	3	0	0	0	0	22
SE	27	2	0	0	0	0	29
SSE	27	16	0	0	0	0	43
S	21	44	3	0	0	0	68
SSW	40	87	23	0	0	0	150
SW	67	152	118	8	0	0	345
WSW	86	270	158	21	0	0	535
W	108	434	104	4	0	0	650
WNW	112	216	18	0	0	0	346
NW	85	186	19	0	0	0	290
NNW	61	128	11	0	0	0	200
Total	933	1676	454	33	0	0	3096

Number of Calm Hours for this Table	19
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	3096
Total Hours for the Period	8760

Beaver Valley Power Station – Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year – 2006
Attachment 1

Part 1: Joint Frequency Distribution Tables (35ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP35P **Direction:** DI35P **Lapse:** DT150-35
Stability Class E Delta Temperature Slightly Stable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	117	20	0	0	0	0	137
NNE	121	12	0	0	0	0	133
NE	162	8	0	0	0	0	172
ENE	158	29	0	0	0	0	188
E	139	19	0	0	0	0	158
ESE	111	10	0	0	0	0	121
SE	107	6	0	0	0	0	113
SSE	134	5	0	0	0	0	139
S	220	49	4	0	0	0	274
SSW	190	110	13	0	0	0	314
SW	147	127	50	3	0	0	328
WSW	130	88	61	6	0	0	285
W	120	59	24	2	0	0	205
WNW	126	32	7	0	0	0	165
NW	128	46	1	0	0	0	175
NNW	105	32	0	0	0	0	137
Total	2215	652	160	11	0	0	3044

Number of Calm Hours for this Table	19
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	3038
Total Hours for the Period	8760

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Part 1: Joint Frequency Distribution Tables (35ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP35P **Direction:** DI35P **Lapse:** DT150-35
Stability Class F Delta Temperature Moderately Stable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	21	0	0	0	0	0	21
NNE	25	3	0	0	0	0	28
NE	34	0	0	0	0	0	34
ENE	46	0	0	0	0	0	46
E	65	0	0	0	0	0	65
ESE	144	0	0	0	0	0	146
SE	202	0	0	0	0	0	205
SSE	218	0	0	0	0	0	220
S	195	10	0	0	0	0	206
SSW	129	26	0	0	0	0	156
SW	47	7	0	0	0	0	55
WSW	18	4	3	0	0	0	25
W	12	0	0	0	0	0	12
WNW	10	0	0	0	0	0	10
NW	16	0	0	0	0	0	16
NNW	17	0	0	0	0	0	17
Total	1199	50	3	0	0	0	1262

Number of Calm Hours for this Table	19
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	1252
Total Hours for the Period	8760

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Part 1: Joint Frequency Distribution Tables (35ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP35P **Direction:** DI35P **Lapse:** DT150-35
Stability Class G Delta Temperature Extremely Stable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	5	1	0	0	0	0	6
NNE	18	0	0	0	0	0	18
NE	30	1	0	0	0	0	31
ENE	27	0	0	0	0	0	27
E	38	0	0	0	0	0	38
ESE	72	0	0	0	0	0	73
SE	153	0	0	0	0	0	153
SSE	116	0	0	0	0	0	118
S	77	2	0	0	0	0	79
SSW	61	2	0	0	0	0	63
SW	28	1	0	0	0	0	29
WSW	9	0	1	0	0	0	10
W	4	0	0	0	0	0	4
WNW	5	0	0	0	0	0	5
NW	9	0	0	0	0	0	9
NNW	4	0	0	0	0	0	4
Total	656	7	1	0	0	0	667

Number of Calm Hours for this Table	19
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	664
Total Hours for the Period	8760

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Part 1: Joint Frequency Distribution Tables (35ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP35P **Direction:** DI35P **Lapse:** DT150-35
Summary of All Stability Classes Delta Temperature

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	212	128	0	0	0	0	340
NNE	242	65	0	0	0	0	307
NE	313	29	0	0	0	0	344
ENE	320	86	0	0	0	0	407
E	267	47	0	0	0	0	314
ESE	353	28	0	0	0	0	384
SE	498	19	0	0	0	0	520
SSE	503	31	0	0	0	0	538
S	516	124	7	0	0	0	649
SSW	423	243	38	0	0	0	706
SW	291	321	184	12	0	0	810
WSW	246	399	241	30	0	0	916
W	249	577	151	6	0	0	983
WNW	261	304	41	0	0	0	606
NW	247	266	25	0	0	0	538
NNW	200	187	11	0	0	0	398
Total	5141	2854	698	48	0	0	8760

Number of Calm Hours for this Table	19
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	8741
Total Hours for the Period	8760

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Part 2: Joint Frequency Distribution Tables (150ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP150P **Direction:** DI150P **Lapse:** DT150-35
Summary of All Stability Classes Delta Temperature

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	175	158	98	3	0	0	434
NNE	285	178	48	7	0	0	518
NE	309	236	11	1	0	0	557
ENE	192	277	107	9	0	0	585
E	112	110	51	0	0	0	273
ESE	65	68	33	5	0	0	171
SE	52	85	40	2	0	0	179
SSE	59	110	50	0	0	0	219
S	112	169	139	9	0	0	429
SSW	216	244	136	23	1	0	620
SW	298	246	272	48	3	0	867
WSW	187	312	266	114	21	2	902
W	140	363	465	208	54	5	1235
WNW	114	405	275	119	7	0	920
NW	113	220	144	28	1	0	506
NNW	108	158	73	6	0	0	345
Total	2537	3339	2208	582	87	7	8760

Number of Calm Hours for this Table	0
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	8760
Total Hours for the Period	8760

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Part 2: Joint Frequency Distribution Tables (150ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP150P **Direction:** DI150P **Lapse:** DT150-35
Stability Class G Delta Temperature Extremely Stable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	25	5	0	0	0	0	30
NNE	42	23	0	0	0	0	65
NE	65	35	0	0	0	0	100
ENE	34	17	2	0	0	0	53
E	17	9	1	0	0	0	27
ESE	6	5	0	0	0	0	11
SE	7	4	0	0	0	0	11
SSE	5	7	1	0	0	0	13
S	20	32	3	0	0	0	55
SSW	46	44	3	0	0	0	93
SW	64	23	1	0	0	0	88
WSW	27	22	1	0	0	0	50
W	14	6	0	1	0	0	21
WNW	17	4	0	0	0	0	21
NW	16	1	0	0	0	0	17
NNW	12	0	0	0	0	0	12
Total	417	237	12	1	0	0	667

Number of Calm Hours for this Table	0
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	667
Total Hours for the Period	8760

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Part 2: Joint Frequency Distribution Tables (150ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP150P **Direction:** DI150P **Lapse:** DT150-35
Stability Class F Delta Temperature Moderately Stable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	64	6	1	0	0	0	71
NNE	130	26	0	0	0	0	156
NE	109	55	2	0	0	0	166
ENE	60	29	2	0	0	0	91
E	32	9	2	0	0	0	43
ESE	22	4	0	0	0	0	26
SE	15	5	0	0	0	0	20
SSE	17	10	0	0	0	0	27
S	38	26	14	0	0	0	78
SSW	79	55	6	0	0	0	140
SW	119	67	20	0	0	0	206
WSW	48	47	2	0	0	0	97
W	25	18	3	2	0	0	48
WNW	14	9	0	0	0	0	23
NW	23	8	0	0	0	0	31
NNW	29	10	0	0	0	0	39
Total	824	384	52	2	0	0	1262

Number of Calm Hours for this Table	0
Number of Variable Direction Hours forthis Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	1262
Total Hours for the Period	8760

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Part 2: Joint Frequency Distribution Tables (150ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP150P **Direction:** DI150P **Lapse:** DT150-35
Stability Class E Delta Temperature Slightly Stable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	62	57	13	0	0	0	132
NNE	91	56	11	3	0	0	161
NE	108	90	4	0	0	0	202
ENE	82	154	50	4	0	0	290
E	53	48	21	0	0	0	122
ESE	32	34	14	0	0	0	80
SE	26	41	16	0	0	0	83
SSE	33	45	12	0	0	0	90
S	46	67	73	3	0	0	189
SSW	76	94	53	9	0	0	232
SW	97	97	119	7	1	0	321
WSW	87	122	69	30	6	1	315
W	72	114	62	43	12	2	305
WNW	48	159	38	14	1	0	260
NW	47	85	18	1	0	0	151
NNW	48	54	9	0	0	0	111
Total	1008	1317	582	114	20	3	3044

Number of Calm Hours for this Table	0
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	3044
Total Hours for the Period	8760

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Part 2: Joint Frequency Distribution Tables (150ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP150P **Direction:** DI150P **Lapse:** DT150-35
Stability Class D Delta Temperature Neutral

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	22	62	63	1	0	0	148
NNE	21	57	16	2	0	0	96
NE	26	41	2	0	0	0	69
ENE	16	53	21	1	0	0	91
E	10	31	16	0	0	0	57
ESE	4	11	6	2	0	0	23
SE	4	23	8	0	0	0	35
SSE	4	38	21	0	0	0	63
S	8	37	38	3	0	0	86
SSW	15	42	65	12	1	0	135
SW	16	53	114	37	2	0	222
WSW	24	113	167	80	13	1	398
W	27	207	329	135	40	3	741
WNW	34	211	189	76	3	0	513
NW	27	112	110	23	0	0	272
NNW	18	76	47	6	0	0	147
Total	276	1167	1212	378	59	4	3096

Number of Calm Hours for this Table	0
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	3096
Total Hours for the Period	8760

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Part 2: Joint Frequency Distribution Tables (150ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP150P **Direction:** DI150P **Lapse:** DT150-35
Stability Class C Delta Temperature Slightly Unstable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	1	6	5	1	0	0	13
NNE	1	5	5	0	0	0	11
NE	0	2	0	0	0	0	2
ENE	0	3	3	1	0	0	7
E	0	2	1	0	0	0	3
ESE	0	3	0	0	0	0	3
SE	0	1	0	0	0	0	1
SSE	0	2	2	0	0	0	4
S	0	2	3	1	0	0	6
SSW	0	3	1	1	0	0	5
SW	0	2	6	1	0	0	9
WSW	1	3	10	1	0	0	15
W	0	7	28	10	1	0	46
WNW	1	14	18	9	1	0	43
NW	0	4	5	1	0	0	10
NNW	0	2	2	0	0	0	4
Total	4	61	89	26	2	0	182

Number of Calm Hours for this Table	0
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	182
Total Hours for the Period	8760

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Part 2: Joint Frequency Distribution Tables (150ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP150P **Direction:** DI150P **Lapse:** DT150-35
Stability Class B Delta Temperature Moderately Unstable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	0	5	3	1	0	0	9
NNE	0	6	2	1	0	0	9
NE	0	2	0	0	0	0	2
ENE	0	5	1	0	0	0	6
E	0	3	1	0	0	0	4
ESE	0	3	1	0	0	0	4
SE	0	0	3	0	0	0	3
SSE	0	3	7	0	0	0	10
S	0	3	3	1	0	0	7
SSW	0	0	0	0	0	0	0
SW	1	2	4	2	0	0	9
WSW	0	0	4	2	0	0	6
W	0	8	16	8	0	0	32
WNW	0	4	9	3	2	0	18
NW	0	3	2	0	1	0	6
NNW	0	6	5	0	0	0	11
Total	1	53	61	18	3	0	136

Number of Calm Hours for this Table	0
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	136
Total Hours for the Period	8760

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Part 2: Joint Frequency Distribution Tables (150ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP150P **Direction:** DI150P **Lapse:** DT150-35
Stability Class A Delta Temperature Extremely Unstable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	1	17	13	0	0	0	31
NNE	0	5	14	1	0	0	20
NE	1	11	3	1	0	0	16
ENE	0	16	28	3	0	0	47
E	0	8	9	0	0	0	17
ESE	1	8	12	3	0	0	24
SE	0	11	13	2	0	0	26
SSE	0	5	7	0	0	0	12
S	0	2	5	1	0	0	8
SSW	0	6	8	1	0	0	15
SW	1	2	8	1	0	0	12
WSW	0	5	13	1	2	0	21
W	2	3	27	9	1	0	42
WNW	0	4	21	17	0	0	42
NW	0	7	9	3	0	0	19
NNW	1	10	10	0	0	0	21
Total	7	120	200	43	3	0	373

Number of Calm Hours for this Table	0
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	0
Number of Valid Hours for this Table	373
Total Hours for the Period	8760

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Part 3: Joint Frequency Distribution Tables (500ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP500P **Direction:** DI500P **Lapse:** DT500-35
Stability Class A Delta Temperature Extremely Unstable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	0	0	1	0	0	0	1
NNE	0	0	1	0	0	0	1
NE	0	0	2	1	0	0	3
ENE	0	1	4	1	0	0	6
E	0	0	2	1	0	0	3
ESE	0	1	3	2	0	0	6
SE	0	0	2	3	0	0	5
SSE	0	0	2	0	0	0	2
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	1	0	0	0	1
Total	0	2	18	8	0	0	28

Number of Calm Hours for this Table	3
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	153
Number of Valid Hours for this Table	28
Total Hours for the Period	8760

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Part 3: Joint Frequency Distribution Tables (500ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP500P **Direction:** DI500P **Lapse:** DT500-35
Stability Class B Delta Temperature Moderately Unstable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	0	1	4	0	0	0	5
NNE	0	0	2	1	0	0	3
NE	0	0	3	1	0	0	4
ENE	0	1	7	3	0	0	11
E	0	0	4	1	0	0	5
ESE	0	1	4	1	0	0	6
SE	0	0	8	4	0	0	12
SSE	0	1	2	0	0	0	3
S	0	1	2	0	0	0	3
SSW	0	0	1	1	0	0	2
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	1	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	2	0	0	0	2
Total	0	5	39	12	1	0	57

Number of Calm Hours for this Table	3
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	153
Number of Valid Hours for this Table	57
Total Hours for the Period	8760

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Part 3: Joint Frequency Distribution Tables (500ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP500P **Direction:** DI500P **Lapse:** DT500-35
Stability Class C Delta Temperature Slightly Unstable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	0	4	10	8	0	0	22
NNE	0	2	3	1	0	0	6
NE	0	1	3	1	0	0	5
ENE	0	4	5	2	1	0	12
E	0	1	3	0	0	0	4
ESE	0	3	5	1	0	0	9
SE	0	4	4	3	0	0	11
SSE	0	2	8	0	0	0	10
S	0	2	2	1	0	0	5
SSW	0	1	2	3	0	0	6
SW	0	2	1	3	0	0	6
WSW	0	0	3	0	0	0	3
W	0	0	1	2	1	0	4
WNW	0	2	7	7	9	0	25
NW	0	0	5	6	0	0	11
NNW	0	2	5	0	0	0	7
Total	0	30	67	38	11	0	146

Number of Calm Hours for this Table	3
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	153
Number of Valid Hours for this Table	146
Total Hours for the Period	8760

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Part 3: Joint Frequency Distribution Tables (500ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP500P **Direction:** DI500P **Lapse:** DT500-35
Stability Class D Delta Temperature Neutral

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	14	64	134	56	0	0	268
NNE	18	38	34	24	1	0	115
NE	29	41	27	2	0	0	99
ENE	19	54	47	35	0	0	155
E	19	54	53	18	0	0	144
ESE	14	50	39	12	2	0	117
SE	11	28	29	36	11	0	115
SSE	15	29	37	32	2	0	115
S	8	36	86	46	2	0	178
SSW	13	33	87	102	19	5	259
SW	16	45	112	221	74	6	474
WSW	14	89	182	159	82	22	548
W	17	85	263	276	123	51	816
WNW	15	93	295	197	64	26	690
NW	24	76	185	108	7	2	402
NNW	19	63	155	47	12	2	298
Total	265	878	1765	1371	399	114	4793

Number of Calm Hours for this Table	3
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	153
Number of Valid Hours for this Table	4792
Total Hours for the Period	8760

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Part 3: Joint Frequency Distribution Tables (500ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP500P **Direction:** DI500P **Lapse:** DT500-35
Stability Class E Delta Temperature Slightly Stable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	14	24	36	16	2	0	92
NNE	16	15	17	11	2	1	62
NE	34	34	14	6	0	0	88
ENE	37	50	37	9	1	0	134
E	30	55	37	5	0	0	127
ESE	25	76	42	14	2	0	159
SE	35	46	32	17	7	0	137
SSE	24	43	35	16	9	0	127
S	17	19	52	71	8	0	167
SSW	24	30	46	90	15	2	207
SW	40	31	68	98	63	4	305
WSW	43	65	51	18	11	2	190
W	48	115	103	20	10	3	300
WNW	32	59	55	5	1	0	152
NW	20	36	46	10	3	0	115
NNW	14	31	36	8	2	0	91
Total	453	729	707	414	136	12	2453

Number of Calm Hours for this Table	3
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	153
Number of Valid Hours for this Table	2451
Total Hours for the Period	8760

Beaver Valley Power Station – Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year – 2006
Attachment 1

Part 3: Joint Frequency Distribution Tables (500ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP500P **Direction:** DI500P **Lapse:** DT500-35
Stability Class F Delta Temperature Moderately Stable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	6	21	6	1	0	0	34
NNE	9	9	1	0	0	0	19
NE	13	19	3	1	0	0	36
ENE	17	19	20	2	0	0	58
E	26	20	4	1	0	0	51
ESE	21	28	9	2	0	0	60
SE	19	29	12	3	1	0	64
SSE	22	32	18	6	0	0	78
S	20	45	45	20	0	0	130
SSW	20	25	23	19	1	0	88
SW	24	19	21	18	5	0	87
WSW	26	40	10	0	0	0	76
W	27	33	13	3	0	0	76
WNW	23	31	7	0	0	0	61
NW	11	16	5	0	0	0	32
NNW	5	8	6	2	0	0	21
Total	289	394	203	78	7	0	971

Number of Calm Hours for this Table	3
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	153
Number of Valid Hours for this Table	971
Total Hours for the Period	8760

Beaver Valley Power Station – Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year – 2006
Attachment 1

Part 3: Joint Frequency Distribution Tables (500ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP500P **Direction:** DI500P **Lapse:** DT500-35
Stability Class G Delta Temperature Extremely Stable

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	0	1	0	0	0	0	1
NNE	0	1	1	0	0	0	2
NE	3	3	2	0	0	0	8
ENE	0	2	1	0	0	0	3
E	2	1	0	0	0	0	3
ESE	1	8	1	0	0	0	10
SE	2	9	0	1	0	0	12
SSE	8	19	7	3	0	0	37
S	3	11	15	9	1	0	39
SSW	1	5	6	16	0	0	28
SW	3	1	2	4	4	0	14
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	1	0	0	0	0	0	1
NW	0	0	1	0	0	0	1
NNW	0	0	0	0	0	0	0
Total	24	61	36	33	5	0	159

Number of Calm Hours for this Table	3
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	153
Number of Valid Hours for this Table	159
Total Hours for the Period	8760

Beaver Valley Power Station – Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year – 2006
Attachment 1

Part 3: Joint Frequency Distribution Tables (500ft)

Hours at Each Wind Speed and Direction

Period of Record = 01/01/06 00:00 through 12/31/06 23:00

Elevation: **Speed:** SP500P **Direction:** DI500P **Lapse:** DT500-35
Summary of All Stability Classes Delta Temperature

	Wind Speed (mph)						
Wind Direction	**1 - 4**	**4 - 8**	**8 - 13**	**13 - 19**	**19 - 25**	**≥ 25**	**Total**
N	34	115	191	81	2	0	423
NNE	43	65	59	37	3	1	208
NE	79	98	54	12	0	0	243
ENE	73	131	121	52	2	0	379
E	77	131	103	26	0	0	337
ESE	61	167	103	32	4	0	367
SE	67	116	87	67	19	0	356
SSE	69	126	109	57	11	0	372
S	48	114	202	147	11	0	522
SSW	58	94	165	231	35	7	590
SW	83	98	204	344	146	10	886
WSW	83	194	246	177	93	24	817
W	92	233	380	301	134	54	1196
WNW	71	185	364	209	75	26	930
NW	55	128	242	124	10	2	561
NNW	38	104	205	57	14	2	420
Total	1031	2099	2835	1954	559	126	8607

Number of Calm Hours for this Table	3
Number of Variable Direction Hours for this Table	0
Number of Invalid Hours	153
Number of Valid Hours for this Table	8604
Total Hours for the Period	8760

Beaver Valley Power Station - Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year - 2006
Attachment 2
Unit 1 and 2 Offsite Dose Calculation Manual Changes

Attachment 2
Attached is a complete copy of the ODCM that includes: Change (22) of the ODCM (Effective: August, 2006) Change (23) of the ODCM (Effective: December, 2006)

Attachment 2 Clarification
A complete copy of the ODCM has been provided to the following offices: United States Nuclear Regulatory Commission Attention: Document Control Desk Washington, DC 20555-0001 United States Nuclear Regulatory Commission Regional Administrator 475 Allendale Road King of Prussia, PA 19406
For a complete copy of the ODCM, contact Mr. Anthony T Lonnett at 724-682-7523.