

RTL A9.690E

Enclosure 2

Annual Radioactive Effluent Release Report (Annual RETS 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 - 2003

Beaver Valley Power Station - Units 1 & 2

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Supplemental Information Page

FACILITY: B.V.P.S. Units 1 and 2	LICENSEE: FENOC
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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 Permissible 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)	
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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	24	28	19	89
2. Total time period for batch releases	minutes	4669	6620	8979	7974	28242
3. Maximum time period for a batch release	minutes	960	1052	1020	1140	1140
4. Average time period for batch releases	minutes	259	276	321	420	317
5. Minimum time period for a batch release	minutes	77	75	85	52	52
6. Average river flow during release periods	cuft/sec	58867	57400	43367	63533	55792
b. Gaseous Batch Releases						
1. Number of batch releases		14	9	11	10	44
2. Total time period for batch releases	minutes	19346	7706	7402	8756	43210
3. Maximum time period for a batch release	minutes	9010	5397	5002	6480	9010
4. Average time period for batch releases	minutes	1382	856	673	876	982
5. Minimum time period for a batch release	minutes	1	77	1	31	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		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

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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	2.97E+01	8.19E+00	2.15E+01	2.01E+00	6.14E+01	2.65E+01
1a. Unit 1 Gases	CI	2.03E+01	4.01E+00	4.20E+00	9.91E-01	2.95E+01	
1b. Unit 2 Gases	CI	9.32E+00	4.17E+00	1.73E+01	1.02E+00	3.18E+01	
2. Average release rate for period	uCi/sec	3.76E+00	1.04E+00	2.73E+00	2.55E-01	1.95E+00	
3. Percent of applicable limit	%	N/A	N/A	N/A	N/A	N/A	
B. Iodines							
1. Site Total Iodine - 131	CI	7.46E-04	3.99E-05	5.52E-04	7.98E-05	1.42E-03	2.83E+01
1a. Unit 1 Iodine - 131	CI	7.31E-04	3.91E-05	9.60E-06	2.93E-06	7.82E-04	
1b. Unit 2 Iodine - 131	CI	1.48E-05	8.10E-07	5.43E-04	7.68E-05	6.35E-04	
2. Average release rate for period	uCi/sec	9.46E-05	5.07E-06	7.01E-05	1.01E-05	4.50E-05	
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	2.68E-05	1.10E-04	1.47E-03	7.25E-05	1.68E-03	3.00E+01
1a. Unit 1 Particulates	CI	2.68E-05	1.10E-04	5.42E-04	0.00E+00	6.79E-04	
1b. Unit 2 Particulates	CI	0.00E+00	0.00E+00	9.26E-04	7.25E-05	9.98E-04	
2. Average release rate for period	uCi/sec	3.40E-06	1.40E-05	1.86E-04	9.19E-06	5.32E-05	
3. Percent of applicable limit	%	N/A	N/A	N/A	N/A	N/A	
D. Gross Alpha							
1. Site Gross alpha radioactivity	CI	1.41E-06	4.90E-07	7.94E-07	8.86E-07	3.58E-06	3.00E+01
1a. Unit 1 Gross alpha	CI	9.23E-07	3.35E-07	7.94E-07	6.20E-07	2.67E-06	
1b. Unit 2 Gross alpha	CI	4.89E-07	1.55E-07	0.00E+00	2.66E-07	9.10E-07	
2. Average release rate for period	uCi/sec	1.79E-07	6.22E-08	1.01E-07	1.12E-07	1.14E-07	
3. Percent of applicable limit	%	N/A	N/A	N/A	N/A	N/A	
E. Tritium							
1. Site Total release	CI	7.22E+01	6.13E+01	4.15E+01	4.24E+01	2.17E+02	3.29E+01
1a. Unit 1 Tritium	CI	6.11E+01	5.08E+01	3.02E+01	2.96E+01	1.72E+02	
1b. Unit 2 Tritium	CI	1.10E+01	1.04E+01	1.13E+01	1.28E+01	4.55E+01	
2. Average release rate for period	uCi/sec	9.16E+00	7.78E+00	5.27E+00	5.38E+00	6.90E+00	
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).

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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	LLD	LLD	2.56E-03	LLD	2.56E-03
krypton-85	CI	1.91E+00	1.47E+00	7.44E-01	1.87E+00	5.99E+00
krypton-85m	CI	1.19E-02	LLD	1.45E-02	LLD	2.64E-02
krypton-87	CI	LLD	LLD	LLD	LLD	LLD
krypton-88	CI	LLD	LLD	LLD	LLD	LLD
xenon-131m	CI	9.69E-02	2.70E-03	5.49E-02	LLD	1.55E-01
xenon-133	CI	6.05E+00	1.95E-03	4.74E+00	LLD	1.08E+01
xenon-133m	CI	5.27E-02	LLD	9.41E-02	LLD	1.47E-01
xenon-135	CI	2.43E-01	LLD	4.40E-01	LLD	6.83E-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	8.36E+00	1.47E+00	6.09E+00	1.87E+00	1.78E+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	1.07E-03	LLD	1.07E-03
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	1.07E-03	ND	1.07E-03

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

ND = None Detected

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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	1.08E+00	6.42E+00	LLD	LLD	7.50E+00
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	1.88E-01	LLD	LLD	LLD	1.88E-01
xenon-133	CI	8.66E+00	1.31E-01	8.65E-02	1.11E-01	8.99E+00
xenon-133m	CI	8.63E-02	LLD	LLD	LLD	8.63E-02
xenon-135	CI	4.92E-02	LLD	LLD	LLD	4.92E-02
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	1.01E+01	6.55E+00	8.65E-02	1.11E-01	1.68E+01
2. Iodines						
iodine-131	CI	2.96E-05	1.62E-06	1.92E-05	5.85E-06	5.63E-05
iodine-133	CI	2.09E-06	LLD	1.87E-05	LLD	2.08E-05
iodine-135	CI	LLD	LLD	LLD	LLD	LLD
Total for period	CI	3.17E-05	1.62E-06	3.79E-05	5.85E-06	7.71E-05
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

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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	9.32E-01	LLD	LLD	LLD	9.32E-01
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	1.01E+00	LLD	LLD	LLD	1.01E+00
xenon-133m	CI	6.11E-03	LLD	LLD	LLD	6.11E-03
xenon-135	CI	1.19E-03	LLD	LLD	LLD	1.19E-03
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	1.95E+00	ND	ND	ND	1.95E+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	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

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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	1.11E+00	LLD	1.11E+00
xenon-133	CI	9.17E+00	LLD	LLD	LLD	9.17E+00
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	9.17E+00	ND	1.11E+00	ND	1.03E+01

2. Iodines						
iodine-131	CI	7.16E-04	3.83E-05	LLD	LLD	7.54E-04
iodine-133	CI	2.83E-05	LLD	LLD	LLD	2.83E-05
iodine-135	CI	LLD	LLD	LLD	LLD	LLD
Total for period	CI	7.44E-04	3.83E-05	ND	ND	7.83E-04

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	2.68E-05	LLD	LLD	LLD	2.68E-05
cobalt-60	CI	LLD	1.04E-05	LLD	LLD	1.04E-05
zinc-65	CI	LLD	9.33E-05	LLD	LLD	9.33E-05
zirconium/niobium-95	CI	LLD	LLD	LLD	LLD	LLD
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	LLD	6.71E-06	7.22E-06	LLD	1.39E-05
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	2.68E-05	1.10E-04	7.22E-06	ND	1.44E-04

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

ND = None Detected

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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	2.48E-02	LLD	2.48E-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	ND	ND	2.48E-02	ND	2.48E-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						
beryllium-7	ci	LLD	LLD	LLD	LLD	LLD
chromium-51	ci	LLD	LLD	LLD	LLD	LLD
manganese-56	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

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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	LLD	LLD
krypton-85	CI	LLD	LLD	LLD	LLD	LLD
krypton-85m	CI	LLD	LLD	LLD	8.34E-03	8.34E-03
krypton-87	CI	LLD	LLD	LLD	LLD	LLD
krypton-88	CI	LLD	LLD	LLD	LLD	LLD
xenon-131m	CI	LLD	1.62E-01	LLD	LLD	1.62E-01
xenon-133	CI	1.07E-01	LLD	1.42E+01	2.38E-02	1.43E+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	1.07E-01	1.62E-01	1.42E+01	3.21E-02	1.45E+01
2. Iodines						
iodine-131	CI	LLD	LLD	5.33E-04	7.39E-05	6.07E-04
iodine-133	CI	LLD	LLD	1.16E-03	LLD	1.16E-03
iodine-135	CI	LLD	LLD	LLD	LLD	LLD
Total for period	CI	ND	ND	1.69E-03	7.39E-05	1.77E-03
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	3.91E-04	6.13E-05	4.52E-04
cobalt-60	CI	LLD	LLD	LLD	7.76E-06	7.76E-06
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	3.39E-06	3.39E-06
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	3.91E-04	7.25E-05	4.63E-04

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	8.18E-02	1.53E-01	4.79E-02	3.58E-02	3.18E-01	2.60E+01
2. Average diluted concentration	uCi/ml	2.20E-07	2.66E-07	4.61E-08	5.83E-08	1.22E-07	
3. Percent of applicable limit	%	3.27E+00	6.10E+00	1.91E+00	1.43E+00	3.18E+00	
B. Tritium							
1. Total release	CI	1.15E+02	2.15E+02	2.95E+02	1.02E+02	7.27E+02	2.50E+01
2. Average diluted concentration	uCi/ml	3.09E-04	3.76E-04	2.84E-04	1.66E-04	2.80E-04	
3. Percent of applicable limit	%	3.09E+00	3.76E+00	2.84E+00	1.66E+00	2.80E+00	
C. Dissolved and entrained gases							
1. Total release	CI	2.29E-04	ND	4.98E-04	ND	7.27E-04	2.70E+01
2. Average diluted concentration	uCi/ml	6.16E-10		4.80E-10		2.80E-10	
3. Percent of applicable limit	%	3.08E-04		2.40E-04		1.40E-04	
D. Gross alpha radioactivity (total release)							
	CI	LLD	LLD	LLD	LLD	LLD	2.89E+01
E. Volume of waste released (prior to dilution)							
	liters	6.03E+05	9.17E+05	1.34E+06	8.77E+05	3.74E+06	1.12E+01
F. Volume of dilution water used							
	liters	3.71E+08	5.72E+08	1.04E+09	6.13E+08	2.59E+09	2.29E+01

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
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1. Fission and activation products						
beryllium-7	CI	LLD	LLD	LLD	8.59E-06	8.59E-06
sodium-24	CI	LLD	LLD	LLD	LLD	LLD
chromium-51	CI	LLD	1.34E-03	7.86E-04	LLD	2.13E-03
manganese-54	CI	2.54E-04	6.55E-04	4.81E-04	2.03E-06	1.39E-03
iron-55	CI	7.58E-03	1.67E-02	9.14E-03	7.59E-03	4.10E-02
iron-59	CI	LLD	LLD	1.27E-04	3.32E-05	1.61E-04
cobalt-57	CI	9.95E-05	2.49E-05	3.75E-05	LLD	1.62E-04
cobalt-58	CI	3.29E-02	3.24E-02	7.43E-03	1.62E-02	8.89E-02
cobalt-60	CI	3.68E-03	8.91E-03	1.99E-03	1.64E-03	1.62E-02
zinc-65	CI	LLD	2.31E-04	LLD	LLD	2.31E-04
strontium-89	CI	LLD	1.03E-04	1.04E-04	LLD	2.08E-04
strontium-90	CI	LLD	LLD	LLD	LLD	LLD
zirconium/niobium-95	CI	1.77E-05	5.56E-04	LLD	3.59E-04	9.33E-04
zirconium/niobium-97	CI	1.98E-03	2.00E-05	4.07E-04	LLD	2.41E-03
molybdenum-99	CI	LLD	LLD	LLD	LLD	LLD
technetium-99m	CI	LLD	LLD	LLD	LLD	LLD
tin-113	CI	LLD	LLD	LLD	LLD	LLD
silver-110m	CI	2.49E-02	7.25E-02	8.23E-03	3.70E-03	1.09E-01
antimony-122	CI	LLD	LLD	6.61E-05	LLD	6.61E-05
antimony-124	CI	3.94E-03	7.80E-03	1.90E-03	1.15E-03	1.48E-02
antimony-125	CI	6.08E-03	1.08E-02	1.68E-02	4.97E-03	3.87E-02
iodine-131	CI	2.65E-04	9.40E-05	2.74E-04	2.33E-05	6.56E-04
cesium-134	CI	1.57E-05	3.81E-05	2.44E-06	1.19E-05	6.81E-05
cesium-137	CI	1.36E-04	3.41E-04	7.42E-05	9.69E-05	6.48E-04
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	8.18E-02	1.53E-01	4.79E-02	3.58E-02	3.18E-01

2. Dissolved and entrained gases						
krypton-85	CI	LLD	LLD	LLD	LLD	LLD
xenon-133	CI	2.29E-04	LLD	4.98E-04	LLD	7.27E-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	2.29E-04	ND	4.98E-04	ND	7.27E-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
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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	7.65E+00 m3	6.90E+01 m3	0.00E+00 % (1)
b. Volume Buried	0.00E+00 m3	4.89E+00 m3	0.00E+00 % (1)
c. Total Activity	3.12E-04 Ci	7.56E-01 Ci	3.00E+01 %
2. Estimate of Major Nuclide Composition by Type of Waste On This Table (2)	Percent (%)	Percent (%)	
H-3	60.10 %	20.60 %	
C-14	0.00 %	0.40 %	
Mn-54	0.31 %	0.22 %	
Fe-55	0.00 %	25.40 %	
Co-58	0.00 %	23.00 %	
Co-60	1.40 %	11.10 %	
Ni-59	0.00 %	0.16 %	
Ni-63	0.00 %	12.00 %	
Cs-134	19.80 %	0.04 %	
Cs-137	16.00 %	6.34 %	
Ce-144/Pr-144	0.69 %	0.66 %	
Pu-238	1.70 %	0.00 %	
Pu-241	0.00 %	0.04 %	
3. Number of Shipments	1	6	
a. Type of Container Used	LSA	1	6
	Type A	0	0
	Type B	0	0
	Large Quantity	0	0
b. Solidification Agent Used	Cement	0	0
	Urea Formaldehyde	0	0
	None	1	6
c. Mode of Transport	Truck	1	6
	Rail	0	0
d. Final Destination	Erwin, TN	0	1
	Oak Ridge, TN	1	5
e. Waste Class per 10 CFR Part 61	Class A	1	6
	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 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		2.94E+02 m3	3.83E+02 m3	0.00E+00 % (1)
b. Volume Buried		5.09E+01 m3	2.13E+01 m3	0.00E+00 % (1)
c. Total Activity		2.25E-01 Ci	2.40E-01 Ci	3.00E+01 %
2. Estimate of Major Nuclide Composition by Type of Waste On This Table (2)		Percent (%)	Percent (%)	
H-3		2.23 %	0.97 %	
C-14		0.59 %	0.80 %	
Cr-51		0.00 %	0.00 %	
Mn-54		1.24 %	0.42 %	
Fe-55		23.60 %	14.90 %	
Co-58		26.40 %	62.20 %	
Co-60		21.30 %	7.59 %	
Ni-59		0.25 %	0.14 %	
Ni-63		15.50 %	5.78 %	
Sr-90		0.02 %	0.01 %	
Nb-95		0.00 %	0.01 %	
Zr-95		0.00 %	0.08 %	
Tc-99		0.01 %	0.02 %	
Ag-110m		0.00 %	0.33 %	
Sb-124		0.00 %	0.19 %	
Sb-125		0.00 %	0.11 %	
I-129		0.01 %	0.04 %	
Cs-134		2.37 %	1.34 %	
Cs-137		6.05 %	4.95 %	
Ce-144/Pr-144		0.06 %	0.01 %	
Pu-241		0.32 %	0.08 %	
3. Number of Shipments		5	8	
a. Type of Container Used	LSA	5	8	
	Type A	0	0	
	Type B	0	0	
	Large Quantity	0	0	
b. Solidification Agent Used	Cement	0	0	
	Urea Formaldehyde	0	0	
	None	5	8	
c. Mode of Transport	Truck	5	8	
	Rail	0	0	
	Other	0	0	
d. Final Destination	Oak Ridge, TN	5	8	
	Wampum, PA	0	0	
e. Waste Class per 10 CFR Part 61	Class A	5	8	
	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	0.00E+00 m3	0.00E+00 % (1)
b. Volume Buried		0.00E+00 m3	0.00E+00 m3	0.00E+00 % (1)
c. Total Activity		0.00E+00 Ci	0.00E+00 Ci	0.00E+00 %
2. Estimate of Major Nuclide Composition by Type of Waste On This Table (2)		Percent (%)	Percent (%)	
3. Number of Shipments		0	0	
a. Type of Container Used	LSA	0	0	
	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	0	
c. Mode of Transport	Truck	0	0	
	Rail	0	0	
	Other	0	0	
d. Final Destination	Barnwell, SC	0	0	
	Oak Ridge, TN	0	0	
e. Waste Class per 10 CFR Part 61	Class A	0	0	
	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)

Nuclide	RWDA-G 1000 cc Gas Grab Sample		RWDA-L 1000 ml Liquid Grab Sample		Filter Paper / Charcoal Continuous Effluent Sample	
	(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	1.59E-07	1E-04	3.65E-08	5E-07	1.80E-13	1E-11
Ar-41	1.24E-07	1E-04	2.86E-08	5E-07	.....	.....
Cr-51	8.26E-07	1E-04	2.02E-07	5E-07	1.47E-12	1E-11
Mn-54	8.13E-08	1E-04	1.92E-08	5E-07	1.11E-13	1E-11
Fe-55	.....	.....	(1) 1.00E-06	1E-06	.....	.....
Fe-59	2.28E-07	1E-04	5.33E-08	5E-07	4.45E-13	1E-11
Co-57	5.97E-08	1E-04	1.70E-08	5E-07	9.47E-14	1E-11
Co-58	1.13E-07	1E-04	2.66E-08	5E-07	1.08E-13	1E-11
Co-60	2.09E-07	1E-04	4.87E-08	5E-07	2.19E-13	1E-11
Zn-65	1.86E-07	1E-04	4.33E-08	5E-07	3.62E-13	1E-11
Kr-85	4.12E-05	1E-04	9.83E-06	1E-05	.....	.....
Kr-85m	9.90E-08	1E-04	2.68E-08	1E-05	.....	.....
Kr-87	1.98E-07	1E-04	4.78E-08	1E-05	.....	.....
Kr-88	2.79E-07	1E-04	7.21E-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	1.78E-07	1E-04	4.09E-08	5E-07	2.85E-13	1E-11
Nb-95	1.50E-07	1E-04	3.55E-08	5E-07	1.44E-13	1E-11
Nb-97	1.32E-07	1E-04	3.14E-08	5E-07	1.99E-13	1E-11
Zr-95	1.90E-07	1E-04	4.48E-08	5E-07	2.57E-13	1E-11
Mo-99	7.48E-08	1E-04	2.05E-08	5E-07	9.67E-14	1E-11
Tc-99m	7.29E-08	1E-04	2.00E-08	5E-07	9.43E-14	1E-11
Ag-110m	1.37E-07	1E-04	3.26E-08	5E-07	2.07E-13	1E-11
Sb-124	1.22E-07	1E-04	2.90E-08	5E-07	1.16E-13	1E-11
Sb-125	2.30E-07	1E-04	5.52E-08	5E-07	5.09E-13	1E-11
I-131	1.05E-07	1E-04	2.54E-08	1E-06	1.51E-13	1E-12
I-133	9.65E-08	1E-04	2.30E-08	5E-07	1.20E-13	1E-10
I-135	4.19E-07	1E-04	9.70E-08	5E-07	8.47E-13	1E-11
Xe-131m	3.19E-06	1E-04	8.47E-07	1E-05	.....	.....
Xe-133	1.75E-07	1E-04	5.81E-08	1E-05	.....	.....
Xe-133m	7.25E-07	1E-04	1.83E-07	1E-05	.....	.....
Xe-135	8.37E-08	1E-04	2.10E-08	1E-05	.....	.....
Xe-135m	1.12E-07	1E-04	2.67E-08	1E-05	.....	.....
Xe-137	3.73E-07	1E-04	8.95E-08	1E-05	.....	.....
Xe-138	2.66E-07	1E-04	6.64E-08	1E-05	.....	.....
Cs-134	9.70E-08	1E-04	2.31E-08	5E-07	1.84E-13	1E-11
Cs-137	1.63E-07	1E-04	3.86E-08	5E-07	2.53E-13	1E-11
Ba-139	4.08E-07	1E-04	1.08E-07	5E-07	4.59E-13	1E-11
Ba-140	3.38E-07	1E-04	8.05E-08	5E-07	2.85E-13	1E-11
La-140	1.12E-07	1E-04	2.51E-08	5E-07	2.17E-13	1E-11
Ce-141	1.50E-07	1E-04	4.09E-08	5E-07	1.71E-13	1E-11
Ce-144	4.83E-07	1E-04	1.34E-07	5E-07	7.24E-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 12/17/03. 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.

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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
O R G A N	Bone	3.18E-03	0.0636	7.42E-03	0.1484	1.10E-03	0.0220	2.03E-03	0.0406	1.37E-02	0.1373
	Liver	6.23E-03	0.1246	1.33E-02	0.2660	4.35E-03	0.0870	5.29E-03	0.1058	2.92E-02	0.2917
	Total Body	4.88E-03	0.3253	9.65E-03	0.6433	3.82E-03	0.2547	4.42E-03	0.2947	2.28E-02	0.7590
	Thyroid	2.54E-03	0.0508	2.37E-03	0.0474	3.70E-03	0.0740	2.45E-03	0.0490	1.11E-02	0.1106
	Kidney	3.05E-03	0.0610	5.97E-03	0.1194	3.33E-03	0.0666	3.30E-03	0.0660	1.57E-02	0.1565
	Lung	2.10E-03	0.0420	3.27E-03	0.0654	3.15E-03	0.0630	2.74E-03	0.0548	1.13E-02	0.1126
(1)	GI-LLI	5.02E-03	0.1004	7.80E-03	0.1560	3.98E-03	0.0796	4.34E-03	0.0868	2.11E-02	0.2114

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)	Beta Air	9.46E-03	0.0946	3.48E-02	0.3480	3.99E-03	0.0399	4.19E-08	0.0000	4.83E-02	0.2413
(2)	Gamma Air	1.26E-03	0.0252	1.17E-02	0.2340	5.73E-04	0.0115	3.75E-07	0.0000	1.35E-02	0.1353
O R G A N	Bone	1.49E-05	0.0002	3.90E-04	0.0052	1.53E-04	0.0020	8.90E-07	0.0000	5.59E-04	0.0037
	Liver	2.37E-01	3.1600	4.13E-01	5.5067	4.76E-01	6.3467	2.48E-01	3.3067	1.37E+00	9.1600
	Total Body	2.37E-01	3.1600	4.13E-01	5.5067	4.76E-01	6.3467	2.48E-01	3.3067	1.37E+00	9.1600
	Thyroid	2.42E-01	3.2267	4.22E-01	5.6267	4.76E-01	6.3467	2.48E-01	3.3067	1.39E+00	9.2533
	Kidney	2.37E-01	3.1600	4.13E-01	5.5067	4.76E-01	6.3467	2.48E-01	3.3067	1.37E+00	9.1600
	Lung	2.37E-01	3.1600	4.13E-01	5.5067	4.76E-01	6.3467	2.48E-01	3.3067	1.37E+00	9.1600
(3)	GI-LLI	2.37E-01	3.1600	4.13E-01	5.5067	4.76E-01	6.3467	2.48E-01	3.3067	1.37E+00	9.1600

(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 mi 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 mi NW.

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

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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
O R G A N (1)	Bone	3.18E-03	0.0636	7.42E-03	0.1484	1.10E-03	0.0220	2.03E-03	0.0406	1.37E-02	0.1373
	Liver	6.23E-03	0.1246	1.33E-02	0.2660	4.35E-03	0.0870	5.29E-03	0.1058	2.92E-02	0.2917
	Total Body	4.88E-03	0.3253	9.65E-03	0.6433	3.82E-03	0.2547	4.42E-03	0.2947	2.28E-02	0.7590
	Thyroid	2.54E-03	0.0508	2.37E-03	0.0474	3.70E-03	0.0740	2.45E-03	0.0490	1.11E-02	0.1106
	Kidney	3.05E-03	0.0610	5.97E-03	0.1194	3.33E-03	0.0666	3.30E-03	0.0660	1.57E-02	0.1565
	Lung	2.10E-03	0.0420	3.27E-03	0.0654	3.15E-03	0.0630	2.74E-03	0.0548	1.13E-02	0.1126
	GI-LLI	5.02E-03	0.1004	7.80E-03	0.1560	3.98E-03	0.0796	4.34E-03	0.0868	2.11E-02	0.2114

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)	Beta Air	1.28E-07	0.0000	8.88E-03	0.0888	8.50E-05	0.0009	1.28E-02	0.1280	2.18E-02	0.1088
(2)	Gamma Air	1.74E-05	0.0003	2.08E-04	0.0042	4.20E-05	0.0008	2.95E-03	0.0590	3.22E-03	0.0322
O R G A N (3)	Bone	1.14E-07	0.0000	3.48E-08	0.0000	9.59E-06	0.0001	2.32E-04	0.0031	2.42E-04	0.0016
	Liver	1.26E-01	1.6800	7.40E-02	0.9867	3.70E-02	0.4933	3.63E-02	0.4840	2.73E-01	1.8220
	Total Body	1.26E-01	1.6800	7.40E-02	0.9867	3.70E-02	0.4933	3.63E-02	0.4840	2.73E-01	1.8220
	Thyroid	1.26E-01	1.6800	7.40E-02	0.9867	3.70E-02	0.4933	5.88E-02	0.7840	2.96E-01	1.9720
	Kidney	1.26E-01	1.6800	7.40E-02	0.9867	3.70E-02	0.4933	3.64E-02	0.4853	2.73E-01	1.8227
	Lung	1.26E-01	1.6800	7.40E-02	0.9867	3.70E-02	0.4933	3.67E-02	0.4893	2.74E-01	1.8247
	GI-LLI	1.26E-01	1.6800	7.40E-02	0.9867	3.70E-02	0.4933	3.63E-02	0.4840	2.73E-01	1.8220

(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 mi 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 mi NW.

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

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Effluent Monitoring Instrumentation Channels Not Returned To Operable Status Within 30 Days

(RM-1LW-104) - Unit 1 Liquid Waste Effluent Monitor

On several occasions during 2003, this monitor was removed from service due to a high background. Historically, maintaining a low background on this monitor was a ongoing problem. Therefore, it was determined that the most feasible way to prevent re-contamination of the monitor detector well was to provide a better filtration system for the Liquid Radwaste Treatment System, and to provide a treated surface for the monitor detector well. In regards to this, a 50 cuft charcoal Pre-Conditioning Filter (PCF) was installed as a temporary modification to the system, and the internal surface of the monitor detector well was treated with the EPRI approved stabilized Chrome Plating Process. Since implementation of these actions, the Acceptance Criteria for maximum contamination levels of the monitor detector well has been maintained. This condition and associated Corrective Actions are detailed in BVPS Condition Reports CR03-09024, CR03-09195 and CR03-11951.

As required by ODCM procedure 1/2-ODC-3.03, Control 3.3.3.9 (Table 3.3-12, Action Statement No. 23), independent sampling, and independent verification of release rate calculations and discharge valving was performed for each applicable batch liquid discharge during the period that this monitor was not OPERABLE.

(RM-1GW-109 Ch-7 & Ch-9) - Unit 1/2 Process Vent Mid & High Range Noble Gas Effluent Monitors
(RM-1VS-110 Ch-7 & Ch-9) - Unit 1 SLCRS Vent Mid & High Range Noble Gas Effluent Monitors

During the most recent calibration of these monitors, it was determined that the solenoid operated flush valves were leaking by, thus causing a dilution of the sample stream. Since no other testing was performed on these valves after the previous calibration in November 2002, then it was determined that the monitor was not providing valid data since shortly after the previous calibration. Upon discovery, the valves were isolated from the sample stream, thus providing a means for valid monitoring of the sample stream. This condition and associated Corrective Actions are detailed in BVPS Condition Report No. CR04-02427.

As required by ODCM procedure 1/2-ODC-3.03, Control 3.3.3.1 and 3.3.3.10 for inoperable monitors, the following information is provided:

- (1) The minimum Preplanned Method of Monitoring (PMM) requirements for [RM-1GW-109] inoperable periods were met in accordance with Control 3.3.3.1, Table 3.3-6. However, the PMM requirements were not met for all of the inoperable periods associated with [RM-1VS-110].
- (2) The minimum monitoring requirements for continuous releases during [RM-1GW-109] inoperable periods were met in accordance with Control 3.3.3.10, Table 3.3-13, Action 29. However, the continuous monitoring requirements were not met for all of the inoperable periods associated with [RM-1VS-110].
- (3) The minimum monitoring requirements for batch releases during [RM-1GW-109] and/or [RM-1VS-110] inoperable periods were met in accordance with Control 3.3.3.10, Table 3.3-13, Action 27.
- (4) The continuous sample collection requirements for releases via the effluent pathways monitored by [RM-1GW-109] and/or [RM-1VS-110] were met in accordance with Control 3.3.3.10, Table 3.3-13, Action 32.

In Summary, the previous offsite dose determinations were validated using redundant samples. For information, redundant continuous sample collection was provided with auxiliary sampling equipment during the periods of monitor inoperability.

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Table 7

Total Dose Commitments, Total Effective Dose Equivalents and Population Doses

2003 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	2.83E-02	3.70E+00	3.73E+00	14.91%
Liver	1.71E+00	3.70E+00	5.41E+00	21.64%
Total Body	1.71E+00	3.70E+00	5.41E+00	21.64%
Thyroid	1.71E+00	3.70E+00	5.41E+00	7.21%
Kidney	1.68E+00	3.70E+00	5.38E+00	21.52%
Lung	1.67E+00	3.70E+00	5.37E+00	21.48%
GI-LLI	1.69E+00	3.70E+00	5.39E+00	21.56%
(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 4.13 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 would be no greater than those doses listed in this table to show compliance with 40 CFR Part 190 or 10 CFR 20.1301. Evaluations have shown that the 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

The 0-50 mile Total Population Dose from liquid and gaseous effluents is 0.839 man-rem (Total Body)
 The 0-50 mile Average Population Dose from liquid and gaseous effluents is 0.000140 mrem (Total Body)

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Table 8

Offsite Dose Calculation Manual Surveillance Deficiencies

There were Surveillance Deficiencies associated with the inoperable periods of mid and high range noble gas effluent monitors [RM-1VS-110 Ch-7 & Ch-9]. Those deficiencies are detailed in Table 6 of this report and documented in BVPS Condition Report No. CR04-02427.

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Table 9

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

There was one change made to ODCM during the report period. See ODCM procedure No. 1/2-ODC-1.01 for a complete description of the change, and the change justification. A brief description of the changes are as follows:

Change (20) to the ODCM (Effective October, 2003)

- 1) **Procedure 1/2-ODC-1.01:** Updated the History of ODCM Changes to include this change.
- 2) **Procedure 1/2-ODC-2.01:** Updated Liquid Waste System diagrams to indicate the flow path for cross-connect of liquid waste between Unit 1 and Unit 2, and to denote use of a charcoal Pre-Conditioning Filter with the Liquid Radwaste Treatment System.
- 3) **Procedure 1/2-ODC-2.02:** Updated the source-term for Unit 1 containment vacuum pumps.
- 4) **Procedure 1/2-ODC-3.03:** Updated the Preplanned Method of Monitoring when the mid range and high range noble gas effluent monitors are inoperable. Updated the activity limits for liquid storage tanks. Added clarifications to gaseous effluent pathway sampling tables.

Beaver Valley Power Station - Units 1 & 2

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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.

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 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) There were no Abnormal Gaseous Releases during the calendar year.

For a copy of the hourly meteorological data during the calendar quarters, contact Mr. Anthony T. Lonnett at 724-682-7523.

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 35 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:12

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: A DT/DZ

ELEVATION: SPEED:SP 35P DIRECTION:DI 35P LAPSE:DT150-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	6	18	2	0	0	0	26
NNE	18	11	0	0	0	0	29
NE	33	6	0	0	0	0	39
ENE	19	32	0	0	0	0	51
E	12	25	0	0	0	0	37
ESE	16	17	1	0	0	0	34
SE	13	20	0	0	0	0	33
SSE	11	13	0	0	0	0	24
S	4	15	0	0	0	0	19
SSW	3	13	4	0	0	0	20
SW	9	17	9	0	0	0	35
WSW	8	31	2	0	0	0	41
W	9	51	3	1	0	0	64
WNW	10	34	4	0	0	0	48
NW	14	22	1	0	0	0	37
NNW	14	18	0	0	0	0	32
TOTAL	199	343	26	1	0	0	569

PERIODS OF CALM(HOURS): 11

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION:
WIND SPEED AND DIRECTION 35 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY UNIT: ONE 03/02/04 16:12

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 03010101-03123124
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:SP 35P DIRECTION:DI 35P LAPSE:DT150-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	5	8	1	0	0	0	14
NNE	7	3	0	0	0	0	10
NE	7	2	0	0	0	0	9
ENE	7	3	0	0	0	0	10
E	3	1	0	0	0	0	4
ESE	3	0	0	0	0	0	3
SE	1	2	0	0	0	0	3
SSE	0	0	0	0	0	0	0
S	2	3	0	0	0	0	5
SSW	1	3	1	0	0	0	5
SW	3	13	10	0	0	0	26
WSW	1	14	3	0	0	0	18
W	3	14	0	0	0	0	17
WNW	6	12	0	0	0	0	18
NW	2	9	0	0	0	0	11
NNW	7	3	1	0	0	0	11
TOTAL	58	90	16	0	0	0	164

PERIODS OF CALM(HOURS): 11
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 35 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:13

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: C DT/DZ

ELEVATION: SPEED:SP 35P DIRECTION:DI 35P LAPSE:DT150-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	9	4	0	0	0	0	13
NNE	1	1	0	0	0	0	2
NE	5	2	0	0	0	0	7
ENE	8	5	0	0	0	0	13
E	5	3	0	0	0	0	8
ESE	0	0	0	0	0	0	0
SE	1	0	0	0	0	0	1
SSE	3	2	0	0	0	0	5
S	2	2	2	0	0	0	6
SSW	1	7	0	0	0	0	8
SW	3	10	12	0	0	0	25
WSW	5	11	5	0	0	0	21
W	6	18	4	1	0	0	29
WNW	3	12	2	0	0	0	17
NW	0	6	0	0	0	0	6
NNW	0	8	0	0	0	0	8
TOTAL	52	91	25	1	0	0	169

PERIODS OF CALM(HOURS): 11

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 35 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:13

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: D DT/DZ

ELEVATION: SPEED:SP 35P DIRECTION:DI 35P LAPSE:DT150-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	61	45	1	0	0	0	107
NNE	76	17	0	0	0	0	93
NE	88	15	0	0	0	0	103
ENE	74	72	0	0	0	0	146
E	41	26	0	0	0	0	67
ESE	19	9	0	0	0	0	28
SE	25	3	0	0	0	0	28
SSE	23	13	0	0	0	0	36
S	26	26	3	0	0	0	55
SSW	42	72	16	0	0	0	130
SW	62	152	132	9	0	0	355
WSW	74	199	145	10	0	0	428
W	76	244	77	5	0	0	402
WNW	75	144	25	0	0	0	244
NW	85	134	2	0	0	0	221
NNW	49	77	7	0	0	0	133
TOTAL	896	1248	408	24	0	0	2576

PERIODS OF CALM(HOURS): 11

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 35 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY UNIT: ONE 03/02/04 16:13

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 03010101-03123124
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SP 35P DIRECTION:DI 35P LAPSE:DT150-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	112	23	0	0	0	0	135
NNE	122	8	0	0	0	0	130
NE	235	9	0	0	0	0	244
ENE	275	81	0	0	0	0	356
E	160	17	0	0	0	0	177
ESE	117	7	0	0	0	0	124
SE	112	2	0	0	0	0	114
SSE	127	17	0	0	0	0	144
S	185	46	2	0	0	0	233
SSW	184	105	6	1	0	0	296
SW	140	167	100	4	0	0	412
WSW	118	161	106	4	0	0	389
W	87	110	36	0	0	0	233
WNW	95	77	10	0	0	0	182
NW	98	79	1	0	0	0	178
NNW	108	47	0	0	0	0	155
TOTAL	2275	956	261	9	0	0	3502

PERIODS OF CALM (HOURS): 11
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 35 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:13

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: F DT/DZ

ELEVATION: SPEED:SP 35P DIRECTION:DI 35P LAPSE:DT150-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	13	1	0	0	0	0	14
NNE	14	1	0	0	0	0	15
NE	41	1	0	0	0	0	42
ENE	48	2	0	0	0	0	50
E	101	0	0	0	0	0	101
ESE	140	0	0	0	0	0	140
SE	207	0	0	0	0	0	209
SSE	192	1	0	0	0	0	197
S	195	7	0	0	0	0	202
SSW	84	4	3	0	0	0	91
SW	35	6	2	0	0	0	44
WSW	15	3	1	1	0	0	20
W	14	2	1	0	0	0	17
WNW	13	2	0	0	0	0	15
NW	12	3	0	0	0	0	15
NNW	13	0	0	0	0	0	13
TOTAL	1137	33	7	1	0	0	1185

PERIODS OF CALM(HOURS): 11

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 35 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:13

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: G DT/DZ

ELEVATION: SPEED:SP 35P DIRECTION:DI 35P LAPSE:DT150-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	4	0	0	0	0	0	4
NNE	9	1	0	0	0	0	10
NE	10	0	0	0	0	0	10
ENE	26	1	0	0	0	0	27
E	61	0	0	0	0	0	61
ESE	57	0	0	0	0	0	57
SE	132	0	0	0	0	0	133
SSE	93	0	0	0	0	0	94
S	75	3	0	0	0	0	78
SSW	39	0	0	0	0	0	39
SW	24	0	0	0	0	0	25
WSW	9	0	0	0	0	0	9
W	4	0	0	0	0	0	4
WNW	3	0	0	0	0	0	3
NW	12	0	0	0	0	0	12
NNW	3	0	0	0	0	0	3
TOTAL	561	5	0	0	0	0	569

PERIODS OF CALM(HOURS): 11

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 35 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:13

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: ALL DT/DZ

ELEVATION: SPEED:SP 35P DIRECTION:DI 35P LAPSE:DT150-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	210	99	4	0	0	0	313
NNE	247	42	0	0	0	0	289
NE	419	35	0	0	0	0	454
ENE	457	196	0	0	0	0	653
E	383	72	0	0	0	0	455
ESE	352	33	1	0	0	0	386
SE	491	27	0	0	0	0	521
SSE	449	46	0	0	0	0	500
S	489	102	7	0	0	0	598
SSW	354	204	30	1	0	0	589
SW	276	365	265	13	0	0	922
WSW	230	419	262	15	0	0	926
W	199	439	121	7	0	0	766
WNW	205	281	41	0	0	0	527
NW	223	253	4	0	0	0	480
NNW	194	153	8	0	0	0	355
TOTAL	5178	2766	743	36	0	0	8734

PERIODS OF CALM(HOURS): 11

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 150 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:15

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: A DT/DZ

ELEVATION: SPEED:SP150P DIRECTION:DI150P LAPSE:DT150-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	2	18	15	1	0	0	36
NNE	4	13	7	1	0	0	25
NE	1	19	7	0	0	0	27
ENE	0	37	19	1	0	0	57
E	0	23	18	3	0	0	44
ESE	1	23	18	4	0	0	46
SE	1	20	24	1	1	0	47
SSE	0	10	14	0	0	0	24
S	1	8	10	2	0	0	21
SSW	2	4	7	2	0	0	15
SW	1	4	6	3	0	0	14
WSW	4	13	9	1	0	0	27
W	1	35	32	4	2	0	74
WNW	7	16	28	9	2	0	62
NW	5	14	9	0	0	0	28
NNW	1	16	5	0	0	0	22
TOTAL	31	273	228	32	5	0	569

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 150 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:16

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: B DT/DZ

ELEVATION: SPEED:SP150P DIRECTION:DI150P LAPSE:DT150-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	5	3	1	0	0	10
NNE	1	8	3	0	0	0	12
NE	0	5	0	0	0	0	5
ENE	1	8	2	0	0	0	11
E	0	3	4	0	0	0	7
ESE	0	5	1	0	0	0	6
SE	0	3	0	0	0	0	3
SSE	0	0	2	1	0	0	3
S	0	3	3	0	0	0	6
SSW	0	1	2	0	0	0	3
SW	0	3	9	1	0	0	13
WSW	3	7	10	3	0	0	23
W	0	11	10	2	0	0	23
WNW	0	6	13	1	0	0	20
NW	3	2	5	0	0	0	10
NNW	1	4	4	0	0	0	9
TOTAL	10	74	71	9	0	0	164

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 150 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:16

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: C DT/DZ

ELEVATION: SPEED:SP150P DIRECTION:DI150P LAPSE:DT150-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	4	5	0	0	0	10
NNE	3	4	0	0	0	0	7
NE	1	3	1	0	0	0	5
ENE	0	5	6	1	0	0	12
E	0	8	1	1	0	0	10
ESE	0	2	1	0	0	0	3
SE	0	2	1	0	0	0	3
SSE	1	5	1	1	0	0	8
S	0	1	2	1	0	0	4
SSW	0	1	3	1	0	0	5
SW	0	2	11	2	0	0	15
WSW	0	1	5	5	0	0	11
W	1	19	13	7	0	1	41
WNW	1	8	6	6	0	0	21
NW	0	6	1	0	0	0	7
NNW	0	3	4	0	0	0	7
TOTAL	8	74	61	25	0	1	169

PERIODS OF CALM (HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 150 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:16

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: D DT/DZ

ELEVATION: SPEED:SP150P DIRECTION:DI150P LAPSE:DT150-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	26	47	37	1	0	0	111
NNE	20	52	10	1	0	0	83
NE	36	43	5	0	0	0	84
ENE	21	69	53	7	0	0	150
E	12	35	36	1	0	0	84
ESE	11	26	13	2	0	0	52
SE	4	12	7	0	0	0	23
SSE	13	25	12	1	0	0	51
S	9	32	27	3	1	0	72
SSW	12	33	44	6	0	0	95
SW	25	47	110	34	2	0	218
WSW	27	77	122	66	6	1	299
W	41	131	238	174	31	7	622
WNW	33	108	146	59	5	0	351
NW	20	85	56	1	0	0	162
NNW	14	64	37	4	0	0	119
TOTAL	324	886	953	360	45	8	2576
PERIODS OF CALM(HOURS):	0						
VARIABLE DIRECTION	0						
HOURS OF MISSING DATA:	26						

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 150 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:16

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: E DT/DZ

ELEVATION: SPEED:SP150P DIRECTION:DI150P LAPSE:DT150-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	74	48	12	0	0	0	134
NNE	109	47	10	1	0	0	167
NE	143	96	18	0	0	0	257
ENE	112	213	92	8	0	0	425
E	59	100	46	1	0	0	206
ESE	25	45	15	0	0	0	85
SE	16	37	16	0	0	0	69
SSE	23	36	20	2	0	0	81
S	41	69	41	4	0	0	155
SSW	67	91	50	1	1	0	210
SW	75	102	131	27	1	0	336
WSW	66	103	123	53	2	2	349
W	57	119	150	111	16	1	454
WNW	44	149	86	28	2	0	309
NW	41	86	34	0	0	0	161
NNW	41	50	13	0	0	0	104

TOTAL	993	1391	857	236	22	3	3502
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PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 150 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:16

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: F DT/DZ

ELEVATION: SPEED:SP150P DIRECTION:DI150P LAPSE:DT150-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	82	13	1	0	0	0	96
NNE	112	24	0	0	0	0	136
NE	120	82	1	0	0	0	203
ENE	61	44	5	0	0	0	110
E	24	8	0	0	0	0	32
ESE	9	8	0	0	0	0	17
SE	14	10	2	0	0	0	26
SSE	19	9	2	0	0	0	30
S	36	19	4	1	0	0	60
SSW	73	59	7	1	0	0	140
SW	78	39	8	0	0	0	125
WSW	40	28	5	0	0	0	73
W	26	23	2	1	2	0	54
WNW	14	16	2	0	0	0	32
NW	12	6	2	0	0	0	20
NNW	27	4	0	0	0	0	31
TOTAL	747	392	41	3	2	0	1185

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 150 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:16

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: G DT/DZ

ELEVATION: SPEED:SP150P DIRECTION:DI150P LAPSE:DT150-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	35	6	0	0	0	0	41
NNE	42	27	0	0	0	0	69
NE	47	41	0	0	0	0	88
ENE	27	19	1	0	0	0	47
E	12	9	0	0	0	0	21
ESE	6	4	0	0	0	0	10
SE	8	5	0	0	0	0	13
SSE	11	7	0	0	0	0	18
S	5	20	1	0	0	0	26
SSW	32	40	0	0	0	0	72
SW	46	28	4	0	0	0	78
WSW	13	19	3	0	0	0	35
W	10	5	0	0	0	0	15
WNW	11	2	1	0	0	0	14
NW	9	1	0	0	0	0	10
NNW	8	4	0	0	0	0	12
TOTAL	322	237	10	0	0	0	569

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 26

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 150 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:16

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: ALL DT/DZ

ELEVATION: SPEED:SP150P DIRECTION:DI150P LAPSE:DT150-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	221	141	73	3	0	0	438
NNE	291	175	30	3	0	0	499
NE	348	289	32	0	0	0	669
ENE	222	395	178	17	0	0	812
E	107	186	105	6	0	0	404
ESE	52	113	48	6	0	0	219
SE	43	89	50	1	1	0	184
SSE	67	92	51	5	0	0	215
S	92	152	88	11	1	0	344
SSW	186	229	113	11	1	0	540
SW	225	225	279	67	3	0	799
WSW	153	248	277	128	8	3	817
W	136	343	445	299	51	9	1283
WNW	110	305	282	103	9	0	809
NW	90	200	107	1	0	0	398
NNW	92	145	63	4	0	0	304
TOTAL	2435	3327	2221	665	74	12	8734
PERIODS OF CALM(HOURS):	0						
VARIABLE DIRECTION	0						
HOURS OF MISSING DATA:	26						

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 500 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:17

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: A DT/DZ

ELEVATION: SPEED:SP500P DIRECTION:DI500P LAPSE:DT500-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	1	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	1	1	0	0	2
SE	0	1	0	1	0	0	2
SSE	0	0	1	0	0	0	1
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	1	0	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
TOTAL	0	1	4	2	0	0	7

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 92

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 500 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:17

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: B DT/DZ

ELEVATION: SPEED:SP500P DIRECTION:DI500P LAPSE:DT500-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	2	0	0	0	2
ENE	1	1	1	2	0	0	5
E	0	0	1	2	1	0	4
ESE	0	1	6	3	2	0	12
SE	0	0	9	0	0	1	10
SSE	0	0	4	0	0	0	4
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	1	0	0	0	0	1
WNW	0	1	0	0	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
TOTAL	1	5	23	7	3	1	40

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 92

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 500 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:17

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: C DT/DZ

ELEVATION: SPEED:SP500P DIRECTION:DI500P LAPSE:DT500-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	1	5	3	0	0	9
NNE	1	2	1	0	0	0	4
NE	0	2	7	1	0	0	10
ENE	0	3	7	1	0	0	11
E	0	3	5	1	0	0	9
ESE	0	3	7	2	1	0	13
SE	0	4	8	1	0	0	13
SSE	0	1	4	1	0	0	6
S	0	0	1	3	0	0	4
SSW	0	1	1	1	0	0	3
SW	0	0	1	0	0	0	1
WSW	0	0	2	0	0	0	2
W	0	1	0	4	0	0	5
WNW	0	4	2	6	0	0	12
NW	1	1	2	1	1	0	6
NNW	1	0	3	1	0	0	5
TOTAL	3	26	56	26	2	0	113

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 92

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 500 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:17

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: D DT/DZ

ELEVATION: SPEED:SP500P DIRECTION:DI500P LAPSE:DT500-

WIND DIRECTION	WIND SPEED (MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	10	46	97	40	1	0	194
NNE	22	31	39	10	0	0	102
NE	14	40	25	21	3	0	103
ENE	25	75	75	35	8	0	218
E	19	73	113	62	1	0	268
ESE	16	66	91	55	9	0	237
SE	12	34	26	36	5	1	114
SSE	10	38	37	12	8	0	105
S	8	17	57	35	13	2	132
SSW	8	32	69	61	12	1	183
SW	14	37	107	221	94	10	483
WSW	20	58	167	224	70	14	553
W	13	110	255	313	175	60	926
WNW	47	142	286	198	76	37	786
NW	12	66	170	80	3	0	331
NNW	18	71	130	37	1	0	257
TOTAL	268	936	1744	1440	479	125	4992

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 92

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 500 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:17

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: E DT/DZ

ELEVATION: SPEED:SP500P DIRECTION:DI500P LAPSE:DT500-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	20	29	41	19	2	0	111
NNE	36	32	7	11	0	0	86
NE	38	39	10	8	1	0	96
ENE	48	52	41	6	0	0	147
E	31	77	48	2	0	0	158
ESE	35	53	40	21	3	0	152
SE	33	41	19	29	1	0	123
SSE	25	28	28	19	11	0	111
S	17	22	34	39	3	0	115
SSW	18	23	31	47	13	1	133
SW	21	45	79	94	31	5	275
WSW	18	79	62	43	11	5	218
W	28	110	124	53	16	5	336
WNW	87	121	84	19	0	1	312
NW	10	40	30	7	0	0	87
NNW	22	19	31	9	0	0	81
TOTAL	487	810	709	426	92	17	2541

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 92

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 500 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:18

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: F DT/DZ

ELEVATION: SPEED:SP500P DIRECTION:DI500P LAPSE:DT500-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	6	2	0	1	0	0	9
NNE	9	4	2	0	0	0	15
NE	12	19	8	1	0	0	40
ENE	17	19	9	2	0	0	47
E	16	22	7	0	0	0	45
ESE	10	30	12	4	0	0	56
SE	12	22	9	2	0	0	45
SSE	13	20	9	7	0	0	49
S	11	6	13	11	0	0	41
SSW	6	13	16	8	1	0	44
SW	20	13	22	20	4	0	79
WSW	9	29	12	7	0	0	57
W	16	31	12	0	0	0	59
WNW	69	81	11	1	0	0	162
NW	10	27	15	1	0	0	53
NNW	5	3	7	1	0	0	16
TOTAL	241	341	164	66	5	0	817

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 92

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 500 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:18

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: G DT/DZ

ELEVATION: SPEED:SP500P DIRECTION:DI500P LAPSE:DT500-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	2	0	0	2
ENE	2	2	3	0	0	0	7
E	4	1	0	0	0	0	5
ESE	3	7	0	0	0	0	10
SE	2	1	1	0	0	0	4
SSE	0	4	1	0	0	0	5
S	4	5	12	2	0	0	23
SSW	0	4	11	9	0	0	24
SW	0	3	19	22	2	0	46
WSW	2	1	9	7	0	0	19
W	1	1	1	0	0	0	3
WNW	5	4	0	0	0	0	9
NW	0	1	0	0	0	0	1
NNW	0	0	0	0	0	0	0
TOTAL	23	34	57	42	2	0	158

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 92

BEAVER VALLEY JOINT FREQUENCY DISTRIBUTION
WIND SPEED AND DIRECTION 500 FT VERSUS
DELTA TEMPERATURE 150-35FT
JANUARY 1, 2003 THROUGH DECEMBER 31, 2003 (Continued)

SITE: BEAVER VALLEY

UNIT: ONE

03/02/04 16:18

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 03010101-03123124

STABILITY CLASS: ALL DT/DZ

ELEVATION: SPEED:SP500P DIRECTION:DI500P LAPSE:DT500-

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	36	79	143	63	3	0	324
NNE	68	69	49	21	0	0	207
NE	64	100	52	33	4	0	253
ENE	93	152	137	46	8	0	436
E	70	176	174	67	2	0	489
ESE	64	160	157	86	15	0	482
SE	59	103	72	69	6	2	311
SSE	48	91	84	39	19	0	281
S	40	50	117	90	16	2	315
SSW	32	73	128	126	26	2	387
SW	55	98	228	357	131	15	884
WSW	49	167	252	281	81	19	849
W	58	254	392	370	191	65	1330
WNW	208	353	384	224	76	38	1283
NW	33	135	217	89	4	0	478
NNW	46	93	171	48	1	0	359
TOTAL	1023	2153	2757	2009	583	143	8668

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 0

HOURS OF MISSING DATA: 92

Beaver Valley Power Station - Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year - 2003

Attachment 2

Unit 1 and 2 Offsite Dose Calculation Manual Changes

Attachment 2

Attached is a complete copy of the ODCM that includes:

Change (20) of the ODCM (Effective October, 2003)

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.