



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

APR 30 2003

10 CFR 50.36a(a)(2)

U S Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D C. 20555

Gentlemen

In the Matter of)
Tennessee Valley Authority)

Docket No 50-390

WATTS BAR NUCLEAR PLANT (WBN) - UNIT 1 - 2002 ANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT (ARERR)

Provided in Enclosure 1 is the 2002 ARERR for WBN. This report fulfills the requirements of Technical Specification 5.9.3 and addresses the period from January 1, 2002, through December 31, 2002. Attachment 1 of the ARERR documents the deviations from Offsite Dose Calculation Manual (ODCM) requirements Attachment 2 documents that there were no radiation monitors inoperable for greater than 30 days

Technical Specification (TS) 5.7 2.3 requires that an updated version of the ODCM be submitted with the AREER if changes occurred during the AREER reporting period. Revision 8 of the ODCM was in effect during the 2002 AREER reporting period. This revision initially became effective on September 27, 2001, and was provided in the 2001 ARERR (TVA's letter dated April 30, 2002). Therefore, a complete copy of the ODCM is not provided in this report.

Enclosure 2 addresses the requirements of the Process Control Program (PCP) which are reported in conjunction with the ARERR in accordance with the ODCM. During the preparation of the 2002 ARERR, an error was noted in a computer program used to generate the report. The reports for previous years were reviewed to establish if the data provided in the reports was impacted by the program error Based on this review, the data for the 1999 and 2001 ARERRs required correction The corrected information for the two reports is provided in Enclosures 3 and 4.

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U.S. Nuclear Regulatory Commission

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If you should have any questions, please contact me at (423) 365-1824.

Sincerely,



P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosures

cc (Enclosures):

NRC Resident Inspector
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

Mr. K. N. Jabbour, Senior Project Manager
U.S. Nuclear Regulatory Commission
MS 08G9
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

Enclosure 1

Watts Bar Nuclear Plant

2002 Annual Radioactive Effluent Release Report

2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

SUPPLEMENTAL INFORMATION

1. Regulatory Limits

A. Gaseous Effluents

1. Dose rates due to radioactivity released in gaseous effluents from the site to areas at and beyond the unrestricted area boundary shall be limited to the following:
 - a. Noble gases: - Less than or equal to 500 mrem/year to the total body.
- Less than or equal to 3000 mrem/year to the skin.
 - b. Iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days:
 - Less than or equal to 1500 mrem/year to any organ.
2. Air dose due to noble gases released in gaseous effluents to areas at and beyond the unrestricted area boundary shall be limited to the following:
 - a. Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation during any calendar quarter.
 - b. Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation during any calendar year.
3. Dose to a member of the public from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than eight days in gaseous effluents released to areas at and beyond the unrestricted area boundary shall be limited to the following:
 - a. Less than or equal to 7.5 mrem to any organ during any calendar quarter.
 - b. Less than or equal to 15 mrem to any organ during any calendar year.

B. Liquid Effluents

1. The concentration of radioactivity released in liquid effluents to unrestricted areas shall be limited to 10 times the concentrations specified in Title 10 of the Code of Federal Regulations, Part 20 (Standards for Protection Against Radiation), Appendix B, Table 2, Column 2, for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2.0 E-04 $\mu\text{Ci/ml}$ total activity.
2. The dose or dose commitment to a member of the public from radioactivity in liquid effluents released to unrestricted areas shall be limited to:
 - a. Less than or equal to 1.5 mrem to the total body and less than or equal to 5 mrem to any organ during any calendar quarter.
 - b. Less than or equal to 3 mrem to the total body and less than or equal to 10 mrem to any organ during any calendar year.

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2. Effluent Concentration Limits

A. Liquids

The Effluent Concentration Limits (ECL) for liquids are those listed in 10 CFR 20, Appendix B, Table 2, Column 2. For dissolved and entrained gases the ECL of $2.0E-04$ $\mu\text{Ci/ml}$ is applied. This ECL is based on the Xe-135 concentration in air (submersion dose) converted to an equivalent concentration in water as discussed in the International Commission on Radiological Protection (ICRP), Publication 2.

B. Gaseous

Concentration limits for gaseous releases are met through compliance with the maximum permissible dose rates for gaseous releases as defined in plant Offsite Dose Calculation Manual (ODCM) and presented in Section 1.A.1 of this report.

3. Average Energy

Watts Bar's ODCM limits the dose equivalent rates due to the release of noble gases to less than or equal to 500 mrem/year to the total body and less than or equal to 3000 mrem/year to the skin. Therefore, the average beta and gamma energies (E) for gaseous effluents as described in Regulatory Guide 1.21, "Measuring, Evaluation, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," are not applicable.

4. Measurements And Approximations Of Total Radioactivity

Radioactivity measurements performed in support of the WBN Offsite Dose Calculation Manual (ODCM) meet the Lower Limit of Detection requirements given in ODCM Tables 2.2-1 and 2.2-2.

A. Liquid Effluents

Batch (Radwaste and Condensate Demineralizer tanks)

Total gamma isotopic activity concentrations are determined on each Radwaste batch tank prior to release. The total activity of a released batch is determined by summing each nuclide's concentration and multiplying by the total volume discharged. Composite samples are maintained and analyzed monthly for tritium and gross alpha, and quarterly for Iron-55, Strontium-89, and Strontium-90. During periods of no significant identified primary to secondary leakage, the volume from each Condensate Demineralizer tank release is obtained and the feedwater tritium concentration is used to determine the curies of tritium released.

Continuous Releases (Turbine Building Sump and Steam Generator Blowdown)

During periods of no significant identified primary to secondary leakage, the volume released from the TBS and SGB is obtained. The TBS tritium concentration is determined via weekly grab samples. The feedwater tritium concentration is used to determine the curies of tritium released from SGB.

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B. Fission and Activation Gases

Airborne effluent gaseous activity is continuously monitored and recorded. Weekly grab samples from the auxiliary building and monthly grab samples from the service building are taken and analyzed to determine the quantity of noble gas activity released based on the total flows for the sample period. Also, noble gas samples are collected and evaluated following startup, shutdown, or rated thermal power change exceeding 15 percent within one hour (sampling only required if dose equivalent I-131 concentration in the primary coolant or the noble gas activity monitor shows that the containment activity has increased more than a factor of 3).

The quantity of noble gases released through the shield building exhaust due to purging of containment is determined by sampling prior to the beginning of the purge, and periodically monitoring the associated countrate during the purge. The total activity released is determined from the total flow recorded for each purge. Also, noble gas samples are collected and evaluated for ongoing containment purges following startup, shutdown, or rated thermal power change exceeding 15 percent within one hour (sampling only required if dose equivalent I-131 concentration in the primary coolant or the noble gas activity monitor shows that the containment activity has increased more than a factor of 3).

The quantity of noble gases released through the shield building exhaust due to the batch release of waste gas decay tanks is determined by sampling each tank prior to release. The total activity released is determined from the total pressure change recorded for the tank during the release.

C. Iodines and Particulates in Gaseous Releases

Iodine and particulate activity is continuously sampled. Charcoal and particulate samples are taken from the shield and auxiliary building exhausts and analyzed at least weekly to determine the total activity released from the plant based on the total vent flows recorded for the sampling period. Also, particulate and charcoal samples are taken from the auxiliary and shield building exhausts once per 24 hours for 7 days following startup, shutdown, or a rated thermal power change exceeding 15 percent within one hour (if dose equivalent I-131 concentration in the primary coolant or the noble gas activity monitor shows that the containment activity has increased more than a factor of 3).

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SUPPLEMENTAL INFORMATION

5. Batch Releases

	Value		Units
	1st Half	2nd Half	
A. Liquid (Radwaste only)			
1. Number of releases	75	37	Each
2. Total time period of releases	10574	5918	Minutes
3. Maximum time period of release	333	260	Minutes
4. Average time period of releases	141	160	Minutes
5. Minimum time period for release	1	1	Minutes
6. Average dilution stream flow during release periods	20,892	28,285	CFS
B. Gaseous (Batches only - containment purges, and waste gas decay tanks)			
1. Number of releases	53	30	Each
2. Total time period of releases	78310	18572	Minutes
3. Maximum time period for release	9728	5286	Minutes
4. Average time period for releases	1478	619	Minutes
5. Minimum time period for release	7	7	Minutes

6. Abnormal Releases

	Value		Units
	1st Half	2nd Half	
A. Liquid			
Number of Releases	none	none	
Total Activity Released	N/A	N/A	Ci
B. Gaseous			
Number of Releases	none	none	
Total Activity Released	N/A	N/A	Ci

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TABLE 1-A

Liquid Effluents - Summation of All Releases

Unit: 1

Starting : 1-Jan-2002 Ending : 30-Jun-2002

Type Of Effluent	Units	Quarter 1	Quarter 2	Est. Tot Error %
A. Fission & Activation Products				
1. Total Release (Not Including Tritium, Gases, Alpha)	Ci	3.11E-02	3.34E-02	25%
2. Average Diluted Concentration During Period	μCi/ml	8.15E-09	6.05E-09	
3. Percent Of Applicable Limit	%	*	*	
B. Tritium				
1. Total Release	Ci	4.26E+02	6.29+01	18%
2. Average Diluted Concentration During Period	μCi/ml	1.12E-04	1.14E-05	
3. Percent Of Applicable Limit	%	*	*	
C. Dissolved And Entrained Gases				
1. Total Release	Ci	1.22E-02	3.92E-04	39%
2. Average Diluted Concentration During Period	μCi/ml	3.20E-09	7.10E-11	
3. Percent Of Applicable Limit	%	1.60E-03	3.55E-05	
D. Gross Alpha Radioactivity				
1. Total Release	Curies	0.000E+00**	0.000E+00	N/A***
E. Waste Volume Released (Pre-Dilution)				
	Liters	1.62E+07	5.20E+07	2%
F. Volume Of Dilution Water Used				
	Liters	3.80E+09	5.47E+09	12%

* Applicable limits are expressed in terms of dose. See Table 7A of this report.

** Zeroes in this table indicate that no radioactivity was present at detectable levels.

*** N/A - Errors in measurements are not reported for these values since none were identified during the reporting period.

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TABLE 1-B
Liquid Effluents - Summation of All Releases
Unit: 1
Starting : 1-Jul-2002 Ending : 31-Dec-2002

Type Of Effluent	Units	Quarter 3	Quarter 4	Est. Tot Error %
A. Fission & Activation Products				
1. Total Release (Not Including Tritium, Gases, Alpha)	Ci	8.02E-02	3.18E-03	25%
2. Average Diluted Concentration During Period	μCi/ml	7.86E-09	3.06E-10	
3. Percent Of Applicable Limit	%	*	*	
B. Tritium				
1. Total Release	Ci	6.96E+01	4.25E+01	18%
2. Average Diluted Concentration During Period	μCi/ml	6.82E-06	4.09E-06	
3. Percent Of Applicable Limit	%	*	*	
C. Dissolved And Entrained Gases				
1. Total Release	Ci	0.00E+00	0.00E+00	N/A***
2. Average Diluted Concentration During Period	μCi/ml	0.00E+00	0.00E+00	
3. Percent Of Applicable Limit	%	0.00E+00	0.00E+00	
D. Gross Alpha Radioactivity				
1. Total Release	Ci	0.00E+00**	0.00E+00	N/A***
E. Waste Volume Released (Pre-Dilution)				
	Liters	8.71E+07	1.45E+08	2%
F. Volume Of Dilution Water Used				
	Liters	1.01E+10	1.02E+10	12%

* Applicable limits are expressed in terms of dose. See Table 7B of this report.

** Zeroes in this table indicate that no radioactivity was present at detectable levels.

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TABLE 2-A
Liquid Effluents

Unit: 1

Starting : 1-Jan-2002 Ending : 30-Jun-2002

Nuclide	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
H-3	Ci	6.44E-03	6.84E-02	4.26E+02	6.28E+01
Fission & Activation Products					
Co-57	Ci	0.00E+00	0.00E+00	3.65E-05	2.04E-05
Co-58	Ci	0.00E+00	0.00E+00	1.02E-02	6.75E-03
Co-60	Ci	0.00E+00	0.00E+00	2.04E-03	1.35E-03
Cr-51	Ci	0.00E+00	0.00E+00	1.33E-03	1.50E-04
Fe-55	Ci	0.00E+00	0.00E+00	1.58E-02	3.96E-03
Fe-59	Ci	0.00E+00	0.00E+00	1.21E-04	3.84E-05
Mn-54	Ci	0.00E+00	0.00E+00	2.76E-04	1.29E-04
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	1.81E-02
Nb-95	Ci	0.00E+00	0.00E+00	1.99E-04	4.92E-05
Sb-124	Ci	0.00E+00	0.00E+00	5.05E-06	1.98E-04
Sb-125	Ci	0.00E+00	0.00E+00	9.30E-04	2.68E-03
Zr-95	Ci	0.00E+00	0.00E+00	1.03E-04	1.44E-05
Ru-103	Ci	0.00E+00	0.00E+00	2.90E-06	0.00E+00
Te-132	Ci	0.00E+00	0.00E+00	3.15E-05	0.00E+00
I-132	Ci	0.00E+00	0.00E+00	1.86E-05	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	2.97E-06	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	1.13E-06	1.13E-06
Totals	Ci	0.00E+00	0.00E+00	3.11E-02	3.34E-02

Dissolved And Entrained Gases

Ar-41	Ci	0.00E+00	0.00E+00	2.06E-04	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	2.26E-05	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	4.69E-05	0.00E+00
Xe-133	Ci	0.00E+00	0.00E+00	1.11E-02	3.92E-04
Xe-133m	Ci	0.00E+00	0.00E+00	1.02E-04	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	7.55E-04	0.00E+00
Totals	Ci	0.00E+00	0.00E+00	1.22E-02	3.92E-04

* Zeroes in this table indicate that no radioactivity was present at detectable levels.

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TABLE 2-B
Liquid Effluents

Unit: 1

Starting : 1-Jul-2002 Ending : 31-Dec-2002

Nuclide	Unit	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
H-3	Ci	1.45E-01	2.88E-02	6.95E+01	4.22E+01
Fission & Activation Products					
Ag-110m	Ci	0.00E+00*	0.00E+00	2.01E-05	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	3.11E-05	7.92E-06
Co-58	Ci	0.00E+00	0.00E+00	3.28E-03	6.32E-04
Co-60	Ci	0.00E+00	0.00E+00	1.82E-03	1.20E-04
Cr-51	Ci	0.00E+00	0.00E+00	4.85E-05	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-55	Ci	0.00E+00	0.00E+00	4.59E-03	2.33E-03
Fe-59	Ci	0.00E+00	0.00E+00	7.51E-06	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	2.09E-04	0.00E+00
Mn-56	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	6.82E-02	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	1.18E-04	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	1.67E-05	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	7.63E-06	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	1.82E-03	8.54E-05
Totals	Ci	0.00E+00	0.00E+00	8.02E-02	3.18E-03

Dissolved And Entrained Gases

	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Totals	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*Zeroes in this table indicate that no radioactivity was present at detectable levels.

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TABLE 3-A

Gaseous Effluents - Summation of All Releases

Unit: 1

Starting : 1-Jan-2002 Ending : 30-Jun-2002

Type Of Effluent	Units	Quarter 1	Quarter 2	Est. Tot Error %
A. Fission & Activation Products				
1. Total Release	Ci	1.49E+01	1.14E+01	22
2. Average Release Rate For Period	μCi/sec	1.92E+00	1.45E+00	
3. Percent Of Applicable Limit	%	*	*	
B. Radioiodines				
1. Total Iodine-131	Ci	0.000E+00**	0.000E+00	N/A***
2. Average Release Rate For Period	μCi/sec	0.000E+00	0.000E+00	
3. Percent Of Applicable Limit	%	*	*	
C. Particulates				
1. Particulates (Half-Lives>8 Days)	Ci	2.45E-05	2.67E-06	40
2. Average Release Rate For Period	μCi/sec	3.15E-06	3.39E-07	
3. Percent Of Applicable Limit	%	*	*	
4. Gross Alpha Radioactivity	Ci	0.000E+00	0.000E+00	
D. Tritium				
1. Total Release	Ci	7.03E+00	1.21E+01	11
2. Average Release Rate For Period	μCi/sec	9.03E-01	1.54E+00	
3. Percent Of Applicable Limit	%	*	*	

* Applicable limits are expressed in terms of dose. See Table 6A of this report.

** Zeroes in this table indicate that no radioactivity was present at detectable levels.

*** N/A - Errors in measurements are not reported for these values since none were identified during the reporting period.

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TABLE 3-B
Gaseous Effluents - Summation of All Releases
Unit: 1
Starting : 1-Jul-2002 Ending : 31-Dec-2002

Type Of Effluent	Units	Quarter 3	Quarter 4	Est. Tot Error %
A. Fission & Activation Products				
1. Total Release	Ci	1.79E+00	5.13E+00	22
2. Average Release Rate For Period	μCi/sec	2.25E-01	6.45E-01	
3. Percent Of Applicable Limit	%	*	*	
B. Radioiodines				
1. Total Iodine-131	Ci	0.000E+00**	0.000E+00	***N/A
2. Average Release Rate For Period	μCi/sec	0.000E+00	0.000E+00	
3. Percent Of Applicable Limit	%	*	*	
C. Particulates				
1. Particulates (Half-Lives>8 Days)	Ci	0.000E+00	0.000E+00	***N/A
2. Average Release Rate For Period	μCi/sec	0.000E+00	0.000E+00	
3. Percent Of Applicable Limit	%	*	*	
4. Gross Alpha Radioactivity	Ci	0.000E+00	0.000E+00	
D. Tritium				
1. Total Release	Ci	9.94E+00	2.11E+01	11
2. Average Release Rate For Period	μCi/sec	1.25E+00	2.65E+00	
3. Percent Of Applicable Limit	%	*	*	

* Applicable limits are expressed in terms of dose. See Table 6-B of this report.

** Zeroes in this table indicate that no radioactivity was present at detectable levels.

*** N/A - Errors in measurements are not reported for these values since none were identified during the reporting period.

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TABLE 4-A

Gaseous Effluents-Ground Level Releases

Unit: 1

Starting : 1-Jan-2002 Ending : 30-Jun-2002

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
Fission Gases					
Xe-131m	Ci	0.00E+00*	0.00E+00	8.20E-05	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	4.96E-04	1.15E-06
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	3.12E-05
Xe-135	Ci	0.00E+00	0.00E+00	2.97E-01	7.27E-02
Xe-133	Ci	0.00E+00	0.00E+00	3.07E+00	6.91E-01
Ar-41	Ci	0.00E+00	0.00E+00	1.16E+01	1.06E+01
Total	Ci	0.00E+00	0.00E+00	1.49E+01	1.14E+01
Iodines					
	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Br-82	Ci	6.80E-07	1.30E-06	0.00E+00	0.00E+00
Co-58	Ci	2.45E-05	2.67E-06	0.00E+00	0.00E+00
Total	Ci	2.52E-05	3.97E-06	0.00E+00	0.00E+00
H-3	Ci	4.57E+00	5.59E+00	2.45E+00	6.55E+00

* Zeroes in this table indicate that no radioactivity was present at detectable levels.

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TABLE 4-B

Gaseous Effluents-Ground Level Releases

Unit: 1

Starting : 1-Jul-2002 Ending : 31-Dec-2002

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Fission Gases					
Kr-85	Ci	0.00E+00*	0.00E+00*	2.83E-06	1.64E-06
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	1.84E-06
Xe-133	Ci	0.00E+00	0.00E+00	1.51E-01	2.66E-01
Ar-41	Ci	0.00E+00	0.00E+00	1.64E+00	4.86E+00
Total	Ci	0.00E+00	0.00E+00	1.79E+00	5.13E+00
Iodines					
Total	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Br-82	Ci	4.20E-07	2.28E-07	0.00E+00	0.00E+00
Total	Ci	4.20E-07	2.28E-07	0.00E+00	0.00E+00
H-3	Ci	7.51E+00	1.32E+01	2.43E+00	7.83E+00

* Zeroes in this table indicate that no radioactivity was present at detectable levels.

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TABLE 5-A
SOLID WASTE (RADIOACTIVE SHIPMENTS)

A. Solid Waste Shipped Offsite for Burial or Disposal (not Irradiated Fuel)

<u>1. Type of Waste</u>	<u>Unit</u>	<u>12 Month Period</u>	<u>Est. (Ci) Error %</u>
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	10.2 145	N/A +/-25%
b. Dry Active Waste, Compressible Waste Contaminated Equipment, etc.	m ³ Ci	122.8 .420	N/A +/-25%
c. Irradiated Components, Control Rods, etc.	m ³ Ci	None None	N/A N/A

2. Estimate of Major Nuclide Composition (by type of waste)

	Percent	Ci
a. Spent resins, filter sludges, evaporator bottoms, etc. (nuclides determined by measurement)		
H-3	0.141	2.04E-1
C-14	0.215	3.11E-1
Mn-54	3.782	5.48E+0
Fe-55	40.88	5.92E+1
Fe-59	0.002	2.90E-3
Co-57	0.174	2.53E-1
Co-58	7.514	1.09E+1
Co-60	12.495	1.81E+1
Ni-59	0.358	5.19E-1
Ni-63	32.881	4.76E+1
Zn-65	0.058	8.34E-2
Sr-90	0.006	8.06E-3
Zr-95	0.005	6.79E-3
Nb-95	0.005	7.00E-3
Sn-113	0.001	8.42E-4
Sb-124	0.003	3.81E-3
Sb-125	0.232	3.37E-1
I-131	0.001	1.26E-3
Cs-134	0.160	2.31E-1
Cs-137	1.061	1.54E+0
Ce-144	0.003	4.18E-3
Pu-241	0.017	2.44E-2

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**TABLE 5-A
SOLID WASTE (RADIOACTIVE SHIPMENTS)**

b. Dry active waste, compressible waste, contaminated equipment, etc. (nuclides determined by estimate)	Percent	Ci
Be-7	0.068	2.85E-4
Cr-51	0.757	3.18E-3
Mn-54	8.199	3.45E-2
Fe-55	39.136	1.64E-1
Fe-59	0.008	3.38E-5
Co-57	0.081	3.40E-4
Co-58	24.75	1.04E-1
Co-60	11.13	4.68E-2
Ni-63	12.11	5.09E-2
Zn-65	0.037	1.57E-4
Zr-95	1.101	4.63E-3
Nb-95	2.390	1.00E-2
Sn-113	0.018	7.73E-5
Sb-125	0.110	4.60E-4
Cs-134	0.005	2.29E-5
Cs-137	0.106	4.45E-4
Ce-144	0.001	5.13E-6
c. Irradiated Components	N/A	N/A

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 TABLE 5-B
 SOLID WASTE (RADIOACTIVE SHIPMENTS)

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
2	Motor Freight	Sequoyah Nuclear Plant
1	Motor Freight	Duratek Resin Processing
4	Motor Freight	Duratek DAW Processing

4. Irradiated Fuel Shipments (Disposition)

<u>Number of Shipments</u>	<u>Type</u> <u>Quantity</u>	<u>Mode of Transportation</u>	<u>Destination</u>
None	N/A	N/A	N/A

5. Solidification of Waste

Was solidification performed? _____ No

If yes, solidification media: _____ N/A

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Radiological Impact

Introduction

Potential doses to maximum individuals and the population around Watts Bar are calculated for each quarter as required in Section 5.2 of the Offsite Dose Calculation Manual (ODCM). Measured plant releases for the reporting period are used to estimate these doses. Dispersion of radioactive effluents in the environment is estimated using meteorological data and riverflow data measured during the period. In this report, the doses resulting from releases are described and compared to limits established for Watts Bar.

Dose Limits

The ODCM specifies limits for the release of radioactive effluents, as well as limits for doses to the general public from the release of radioactive effluents. These limits are set well below the Technical Specification limits which govern the concentrations of radioactivity and doses permissible in unrestricted areas. This ensures that radioactive effluent releases are As Low As Reasonably Achievable.

Dose Calculations

Estimated doses to the public are determined using computer models (the Gaseous Effluent Licensing Code, GELC, and the Quarterly Water Dose Assessment Code, QWATA). These models are based on guidance provided by the NRC (in Regulatory Guides 1.109, 1.111 and 1.113) for determining the potential dose to individuals and populations living in the vicinity of the plant. The area around the plant is analyzed to determine the pathways through which the public may receive a dose. The doses calculated are a representation of the dose to a "maximum exposed individual." Some of the factors used in these calculations (such as ingestion rates) are maximum values. Many of these factors are obtained from NUREG/CR-1004. The values chosen will tend to overestimate the dose to this "maximum" person. The expected dose to actual individuals is lower. The calculated doses are presented in Tables 6A, 6B, 7A and 7B.

Doses From Airborne Effluents

For airborne effluents, the public can be exposed to radiation from several sources: direct radiation from the radioactivity in the air, direct radiation from radioactivity deposited on the ground, inhalation of airborne radioactivity, ingestion of vegetation which contains radioactivity deposited from the atmosphere, and ingestion of milk and beef which contains radioactivity deposited from the atmosphere onto vegetation and subsequently eaten by milk and beef animals.

Airborne Discharge Points

All releases from Watts Bar are considered ground-level releases. The ground-level Joint Frequency Distribution (JFD) is derived from wind speeds and directions measured 10 meters above ground and from the vertical temperature difference between 10 and 46 meters, and are presented for each quarter on pages E1-25 through E1-52.

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Radiological Impact

Meteorological Data

Meteorological variables at Watts Bar are measured continuously. Measurements collected include wind speed, wind direction, and temperature at heights of 10, 46, and 91 meters above the ground. Quarterly joint frequency distributions (JFDs) are calculated for each release point using the appropriate levels of meteorological data. A joint frequency distribution gives the percentage of the time in a quarter that the wind is blowing out of a particular upwind compass sector in a particular range of wind speeds for a given stability class A through G. The wind speeds are divided into nine wind speed ranges. Calms are distributed by direction in proportion to the distribution of non-calm wind directions less than 0.7 m/s (1.5 mph). Stability classes are determined from the vertical temperature difference between two measurement levels.

External Exposure Dose

Dose estimates for maximum external air dose (gamma-air and beta-air doses) are made for points at and beyond the unrestricted area boundary as described in the Watts Bar ODCM. The highest of these doses is then selected.

Submersion Dose

External doses to the skin and total body, due to submersion in a cloud of noble gases, are estimated for the nearest residence in each sector. The residence with the highest dose is then selected from all sectors.

Organ Dose

Doses to organs due to releases of airborne effluents are estimated for the inhalation, ground contamination, and ingestion pathways. The ingestion pathway is further divided into four possible contributing pathways: ingestion of cow/goat milk, ingestion of beef, and ingestion of vegetables. Doses from applicable pathways are calculated for each real receptor location identified in the most recent land use survey. To determine the maximum organ dose, the doses from the pathways are summed for each receptor. For the ingestion dose, however, only those pathways that exist for each receptor are considered in the sum, i.e., milk ingestion doses are included only for locations where milk is consumed without commercial preparation and vegetable ingestion is included only for those locations where a garden is identified. To conservatively account for beef ingestion, a beef ingestion dose equal to that for the highest unrestricted area boundary location is added to each identified receptor. For ground contamination, the dose added to the organ dose being calculated is the total body dose calculated for that location, i.e., it is assumed that the dose to an individual organ is equal to the total body dose.

Doses from airborne effluents are presented in Tables 6A and 6B.

Doses From Liquid Effluents

For liquid effluents, the public can be exposed to radiation from three sources: the ingestion of water from the Tennessee River, the ingestion of fish caught in the Tennessee River, and direct exposure from radioactive material deposited on the river shoreline sediment (recreation).

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Radiological Impact

The concentrations of radioactivity in the Tennessee River are estimated by a computer model which uses measured hydraulic data downstream of Watts Bar. Parameters used to determine the doses are based on guidance given by the NRC (in Regulatory Guide 1.109) for maximum ingestion rates, exposure times, etc. Wherever possible, parameters used in the dose calculation are site specific use factors determined by TVA. The models that are used to estimate doses, as well as the parameters input to the models, are described in detail in the Watts Bar ODCM.

Liquid Release Points and River Data

Radioactivity concentrations in the Tennessee River are calculated assuming that releases in liquid effluents are continuous. All routine liquid releases from Watts Bar, located at Tennessee River Mile 528.5, are made through diffusers which extend into the Tennessee River. It is assumed that releases to the river through these diffusers will initially be entrained in one-tenth of the water which flows past the plant. The QWATA code makes the assumption that this mixing condition holds true until the water is completely mixed at Tennessee River Mile 510.0.

Doses are calculated for locations within a 50 mile radius downstream of the plant site. The maximum potential recreation dose is calculated for a location immediately downstream from the plant outfall. The maximum individual dose from ingestion of fish is assumed to be that calculated for the consumption of fish caught anywhere between the plant and the first downstream dam (Chickamauga Dam). The maximum individual dose from drinking water is assumed to be that calculated at the nearest downstream public water supply (Dayton, TN). This could be interpreted as indicating that the maximum individual, as assumed for liquid releases from Watts Bar, is an individual who obtains all of his drinking water at Dayton, TN, consumes fish caught from the Tennessee River between Watts Bar and Chickamauga Dam, and spends 500 hours per year on the shoreline just below the outfall from Watts Bar. Dose estimates for the maximum individual due to liquid effluents for each quarter in the period are presented in Tables 7A and 7B, along with the average river flows past the plant site for the periods.

Population Doses

Population doses for highest exposed organ due to airborne effluents are calculated for an estimated 1,066,600 persons living within a 50-mile radius of the plant site. Doses from external pathways and inhalation are based on the 50-mile human population distribution. Ingestion population doses are calculated assuming that each individual consumes milk, vegetables, and meat produced within the sector annulus in which he resides. Doses from external pathways and inhalation are based on the 50-mile human population distribution.

Population doses for total body and the maximum exposed organ due to liquid effluents are calculated for the entire downstream Tennessee River Population. Water ingestion population doses are calculated using actual population figures for downstream public water supplies. Fish ingestion population doses are calculated assuming that all sport fish caught in the Tennessee River are consumed by the Tennessee River population. Recreation population doses are calculated using actual recreational data on the number of shoreline visits at downstream locations.

Population dose estimates for airborne and liquid effluents are presented in Tables 6A, 6B, 7A and 7B.

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Radiological Impact

Direct Radiation

External gamma radiation levels were measured by thermoluminescent dosimeters (TLDs) deployed around WBN as part of the offsite Environmental Radiological Monitoring Program. The quarterly gamma radiation levels determined from these TLDs during this reporting period averaged 16.0 mR/quarter at onsite (at or near the site boundary) stations and 14.5 mR/quarter at offsite stations or 1.5 mR/quarter higher onsite than at offsite stations. This difference is consistent with levels measured for preoperation and construction phases of the WBN plant site where the average radiation levels onsite were generally 2-6 mR/quarter higher than the levels offsite. This may be attributable to natural variations in environmental radiation levels, earth moving activities onsite, the mass of concrete employed in the construction of the plants, or other undetermined influences. Fluctuations in natural background dose rates and in TLD readings tend to mask any small increments which may be due to plant operations. Thus, there was no identifiable increase in dose rate levels attributable to direct radiation from plant equipment and/or gaseous effluents.

Dose To A Member Of The Public Inside The Unrestricted Area Boundary

As stated in the Watts Bar Offsite Dose Calculation Manual, an evaluation of the dose to a member of the public inside the unrestricted area boundary is performed for a hypothetical TVA employee who works just outside the restricted area boundary for an entire work year (2000 hours). Results from onsite TLD measurements indicated that the highest onsite TLD reading outside the Radiological Control Area was 108 mrem. Using this value, subtracting an annual background value of approximately 64 mrem/year (see previous section), and multiplying by the ratio of the occupancy times (2000/8760), the highest external dose to a member of the public inside the unrestricted area boundary would be 10.0 mrem. The doses due to radioactive effluents released to the atmosphere calculated in this report would not add a significant amount to this measured dose. This dose is well below the 10 CFR 20 annual limit of 100 mrem.

Total Dose

To determine compliance with 40 CFR 190, annual total dose contributions to the maximum individual from Watts Bar radioactive effluents and all other nearby uranium fuel cycle sources are considered.

The annual dose to any organ other than thyroid for the maximum individual is conservatively estimated by summing the following doses: the total body air submersion dose for each quarter, the critical organ dose (for any organ other than the thyroid) from airborne effluents for each quarter from ground contamination, inhalation and ingestion, the total body dose from liquid effluents for each quarter, the maximum organ dose (for any organ other than the thyroid) from liquid effluents for each quarter, and any identifiable increase in direct radiation dose levels as measured by the environmental monitoring program. This dose is compared to the 40 CFR 190 limit for total body or any organ dose (other than thyroid) to determine compliance.

The annual thyroid dose to the maximum individual is conservatively estimated by summing the following doses: the total body air submersion dose for each quarter, the thyroid dose from airborne effluents for each quarter, the total body dose from liquid effluents for each quarter, the thyroid dose from liquid effluents for each quarter, and any identifiable increase in direct radiation dose levels as measured by the environmental monitoring program. This dose is compared to the 40 CFR 190 limit for thyroid dose to determine compliance. Cumulative annual total doses are presented in Table 8.

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TABLE 6-A
Doses from Airborne Effluents

First Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	3.37E-02 mrad	5 mrad	< 1%	ENE/1370 meters
Beta Air	1.33E-02 mrad	10 mrad	< 1%	ENE/1370 meters
Submersion				
Total Body	1.34E-02 mrem	N/A	N/A	ENE/2414 meters
Skin	2.00E-02 mrem	N/A	N/A	ENE/2414 meters
Organ Doses				
Child/Thyroid	9.45E-03 mrem	7.5 mrem	< 1%	NE/3829 meters
Child/Total Body	9.46E-03 mrem	7.5 mrem	< 1%	NE/3829 meters

Population Doses

Total Body Dose 2.77E-02 man-rem
Maximum Organ Dose (organ) 2.77E-02 man-rem (thyroid)

Second Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	3.15E-02 mrad	5 mrad	< 1%	ENE/1370 meters
Beta Air	1.14E-02 mrad	10 mrad	< 1%	ENE/1370 meters
Submersion				
Total Body	1.36E-02 mrem	N/A	N/A	SE/1372 meters
Skin	2.01E-02 mrem	N/A	N/A	SE/1372 meters
Organ Doses				
Child/Thyroid	1.54E-02 mrem	7.5 mrem	< 1%	NE/3829 meters
Child/Total Body	1.54E-02 mrem	7.5 mrem	< 1%	NE/3829 meters

Population Doses

Total Body Dose 4.41E-02 man-rem
Maximum Organ Dose (organ) 4.41E-02 man-rem (thyroid)

Population doses can be compared to the natural background dose for the entire 50-mile population of about 150,000 man-rem/year (based on 140 mrem/yr for natural background).

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TABLE 6-B
Doses from Airborne Effluents

Third Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	5.34E-03 mrad	5 mrad	< 1%	E/1280 meters
Beta Air	1.95E-03 mrad	10 mrad	< 1%	E/1280 meters
Submersion				
Total Body	2.07E-03 mrem	N/A	N/A	SE/1372 meters
Skin	3.05E-03 mrem	N/A	N/A	SE/1372 meters
Organ Doses				
Child/Thyroid	6.62E-03 mrem	7.5 mrem	< 1%	NE/3829 meters
Child/Total Body	6.62E-03 mrem	7.5 mrem	< 1%	NE/3829 meters

Population Doses

Total Body Dose 3.08E-02 man-rem
Maximum Organ Dose (organ) 3.08E-02 man-rem (thyroid)

Fourth Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	1.35E-02 mrad	5 mrad	< 1%	ESE/1250 meters
Beta Air	4.85E-03 mrad	10 mrad	< 1%	ESE/1250 meters
Submersion				
Total Body	8.03E-03 mrem	N/A	N/A	SE/1372 meters
Skin	1.18E-02 mrem	N/A	N/A	SE/1372 meters
Organ Doses				
Child/Thyroid	1.11E-02 mrem	7.5 mrem	< 1%	NE/3829 meters
Child/Total Body	1.11E-02 mrem	7.5 mrem	< 1%	NE/3829 meters

Population Doses

Total Body Dose 5.39E-02 man-rem
Maximum Organ Dose (organ) 5.39E-02 man-rem (thyroid)

Population doses can be compared to the natural background dose for the entire 50-mile population of about 150,000 man-rem/year (based on 140 mrem/yr for natural background).

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TABLE 7-A
Doses from Liquid Effluents

First Quarter

Individual Doses (mrem)

Age Group	Organ	Dose	Quarterly Limit	Percent of Limit
Child	Total Body	2.2E-03	1.5 mrem	< 1 %
Adult	GIT	2.9E-03	5 mrem	< 1 %
Child	Thyroid	2.1E-03	5 mrem	< 1 %

Average Riverflow past WBN (cubic feet per second): 28,576

Population Doses

Total Body Dose 1.2E-01 man-rem
Maximum Organ Dose (organ) 1.2E-01 man-rem (GIT)

Second Quarter

Individual Doses (mrem)

Age Group	Organ	Dose	Quarterly Limit	Percent of Limit
Child	Total Body	1.1E-03	1.5 mrem	< 1 %
Adult	GIT	1.7E-03	5 mrem	< 1 %
Child	Thyroid	1.1E-03	5 mrem	< 1 %

Average Riverflow past WBN (cubic feet per second): 13,207

Population Doses

Total Body Dose 4.0E-02 man-rem
Maximum Organ Dose (organ) 4.1E-02 man-rem (GIT)

Population doses can be compared to the natural background dose for the entire 50-mile population of about 150,000 man-rem/year (based on 140 mrem/yr for natural background).

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TABLE 7-B
Doses from Liquid Effluents

Third Quarter

Individual Doses (mrem)

Age Group	Organ	Dose	Quarterly Limit	Percent of Limit
Child	Total Body	9.5E-04	1.5 mrem	< 1 %
Adult	GIT	1.9E-03	5 mrem	< 1 %
Child	Thyroid	9.3E-04	5 mrem	< 1 %

Average Riverflow past WBN (cubic feet per second): 17,405

Population Doses

Total Body Dose 3.7E-02 man-rem
Maximum Organ Dose (organ) 3.8E-02 man-rem (GIT)

Fourth Quarter

Individual Doses (mrem)

Age Group	Organ	Dose	Quarterly Limit	Percent of Limit
Child	Total Body	1.6E-04	1.5 mrem	< 1 %
Child	GIT	1.6E-04	5 mrem	< 1 %
Child	Thyroid	1.5E-04	5 mrem	< 1 %

Average Riverflow past WBN (cubic feet per second): 39,164

Population Doses

Total Body Dose 9.7E-03 man-rem
Maximum Organ Dose (organ) 9.8E-03 man-rem (GIT)

Population doses can be compared to the natural background dose for the entire 50-mile population of about 150,000 man-rem/year (based on 140 mrem/yr for natural background).

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 TABLE 8
 Total Dose from Fuel Cycle

Dose	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	
Total Body or any Organ (except thyroid)					
Total body air submersion	1.3E-02	1.4E-02	2.1E-03	8.0E-03	
Critical organ dose (air)	9.5E-03	1.5E-02	6.6E-03	1.1E-02	
Total body dose (liquid)	2.2E-03	1.1E-03	9.5E-04	1.6E-04	
Maximum organ dose (liquid)	2.9E-03	1.7E-03	1.9E-03	1.6E-04	
Direct Radiation Dose	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Total	2.8E-02	3.2E-02	1.2E-02	1.9E-02	
Cumulative Total Dose (mrem)					9.0E-02
Annual Dose Limit (mrem)					25
Percent of Limit					0.36 %
Thyroid					
Total body air submersion	1.3E-02	1.4E-02	2.1E-03	8.0E-03	
Thyroid dose (airborne)	9.5E-03	1.5E-02	6.6E-03	1.1E-02	
Total body dose (liquid)	2.2E-03	1.1E-03	9.5E-04	1.6E-04	
Thyroid dose (liquid)	2.1E-03	1.1E-03	9.3E-04	1.5E-04	
Direct Radiation Dose	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Total	2.7E-02	3.1E-02	1.1E-02	1.9E-02	
Cumulative Total Dose (mrem)					8.8E-02
Annual Dose Limit (mrem)					75
Percent of Limit					0.12 %

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JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS A (DELTA T<=-1.9 C/100 M)

Watts Bar Nuclear Plant

JAN 1, 2002 - MAR 31, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.000	0.000	0.381	0.048	0.000	0.000	0.428
NNE	0.000	0.000	0.000	0.000	0.190	0.238	0.000	0.000	0.000	0.428
NE	0.000	0.000	0.000	0.000	0.048	0.000	0.000	0.000	0.000	0.048
ENE	0.000	0.000	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.048
E	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESE	0.000	0.000	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.048
SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SSE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	0.000	0.000	0.000	0.000	0.048	0.095	0.000	0.000	0.000	0.143
SSW	0.000	0.000	0.000	0.048	0.190	1.666	0.095	0.000	0.000	1.999
SW	0.000	0.000	0.000	0.000	0.095	0.286	0.000	0.000	0.000	0.381
WSW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W	0.000	0.000	0.000	0.000	0.143	0.095	0.000	0.000	0.000	0.238
WNW	0.000	0.000	0.000	0.000	0.000	0.286	0.000	0.000	0.000	0.286
NW	0.000	0.000	0.000	0.000	0.000	0.048	0.048	0.000	0.000	0.095
NNW	0.000	0.000	0.000	0.000	0.000	0.238	0.143	0.000	0.000	0.381
SUBTOTAL	0.000	0.000	0.095	0.048	0.714	3.332	0.333	0.000	0.000	4.522

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2103
TOTAL HOURS OF STABILITY CLASS A	95
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS A	95
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2101
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/05/14

MEAN WIND SPEED = 9.09

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

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JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS B (-1.9 < DELTA T <= -1.7 C/100 M)

Watts Bar Nuclear Plant

JAN 1, 2002 - MAR 31, 2002

WIND DIRECTION	CALM	WIND SPEED(MPH)								TOTAL
		0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.095	0.095	0.143	0.000	0.000	0.000	0.333
NNE	0.000	0.000	0.000	0.143	0.143	0.190	0.000	0.000	0.000	0.476
NE	0.000	0.000	0.000	0.095	0.095	0.095	0.000	0.000	0.000	0.286
ENE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
E	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SSE	0.000	0.000	0.000	0.000	0.048	0.000	0.000	0.000	0.000	0.048
S	0.000	0.000	0.000	0.000	0.190	0.095	0.048	0.000	0.000	0.333
SSW	0.000	0.000	0.000	0.048	0.333	0.286	0.048	0.000	0.000	0.714
SW	0.000	0.000	0.000	0.190	0.095	0.000	0.000	0.000	0.000	0.286
WSW	0.000	0.000	0.000	0.095	0.048	0.095	0.000	0.000	0.000	0.238
W	0.000	0.000	0.000	0.000	0.190	0.095	0.000	0.000	0.000	0.286
WNW	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.000	0.000	0.048
NW	0.000	0.000	0.000	0.000	0.048	0.095	0.000	0.000	0.000	0.143
NNW	0.000	0.000	0.000	0.000	0.048	0.190	0.000	0.000	0.000	0.238
SUBTOTAL	0.000	0.000	0.000	0.666	1.333	1.285	0.143	0.000	0.000	3.427

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2103
TOTAL HOURS OF STABILITY CLASS B	73
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS B	72
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2101
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/05/14

MEAN WIND SPEED = 7.49

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS C (-1.7< DELTA T<=-1.5 C/100 M)

Watts Bar Nuclear Plant

JAN 1, 2002 - MAR 31, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.095	0.000	0.286	0.000	0.000	0.000	0.381
NNE	0.000	0.000	0.048	0.286	0.381	0.333	0.000	0.000	0.000	1.047
NE	0.000	0.000	0.048	0.095	0.238	0.048	0.000	0.000	0.000	0.428
ENE	0.000	0.000	0.095	0.143	0.000	0.000	0.000	0.000	0.000	0.238
E	0.000	0.000	0.095	0.095	0.000	0.000	0.000	0.000	0.000	0.190
ESE	0.000	0.000	0.000	0.095	0.000	0.000	0.000	0.000	0.000	0.095
SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SSE	0.000	0.000	0.048	0.048	0.000	0.000	0.000	0.000	0.000	0.095
S	0.000	0.000	0.000	0.143	0.286	0.000	0.048	0.000	0.000	0.476
SSW	0.000	0.000	0.000	0.381	0.238	0.381	0.000	0.000	0.000	1.000
SW	0.000	0.000	0.048	0.333	0.381	0.000	0.000	0.000	0.000	0.762
WSW	0.000	0.000	0.048	0.190	0.000	0.048	0.000	0.000	0.000	0.286
W	0.000	0.000	0.000	0.000	0.095	0.333	0.048	0.000	0.000	0.476
WNW	0.000	0.000	0.000	0.000	0.000	0.333	0.000	0.000	0.000	0.333
NW	0.000	0.000	0.048	0.000	0.000	0.048	0.048	0.000	0.000	0.143
NNW	0.000	0.000	0.048	0.000	0.000	0.143	0.048	0.000	0.000	0.238
SUBTOTAL	0.000	0.000	0.524	1.904	1.618	1.951	0.190	0.000	0.000	6.188

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2103
TOTAL HOURS OF STABILITY CLASS C	130
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS C	130
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2101
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/05/14

MEAN WIND SPEED = 6.78

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS D (-1.5 < DELTA T <= -0.5 C/100 M)

Watts Bar Nuclear Plant

JAN 1, 2002 - MAR 31, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.571	0.714	1.333	2.570	0.000	0.000	0.000	5.188
NNE	0.000	0.095	0.809	1.713	1.571	1.190	0.048	0.000	0.000	5.426
NE	0.000	0.000	0.571	1.000	0.476	0.143	0.000	0.000	0.000	2.189
ENE	0.000	0.048	0.333	0.428	0.143	0.048	0.000	0.000	0.000	1.000
E	0.000	0.048	0.286	0.095	0.000	0.000	0.000	0.000	0.000	0.428
ESE	0.000	0.000	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.190
SE	0.000	0.000	0.095	0.000	0.000	0.000	0.000	0.000	0.000	0.095
SSE	0.000	0.095	0.381	0.095	0.048	0.048	0.000	0.000	0.000	0.666
S	0.000	0.048	0.666	0.238	0.190	0.286	0.095	0.000	0.000	1.523
SSW	0.000	0.000	0.714	1.238	0.571	1.142	0.428	0.000	0.000	4.093
SW	0.000	0.000	0.571	1.333	0.048	0.286	0.000	0.000	0.000	2.237
WSW	0.000	0.095	0.476	0.286	0.143	0.095	0.000	0.000	0.000	1.095
W	0.000	0.000	0.428	0.286	0.190	0.286	0.000	0.000	0.000	1.190
WNW	0.000	0.048	0.238	0.524	0.666	0.857	0.000	0.000	0.000	2.332
NW	0.000	0.048	0.333	0.333	0.952	1.190	0.048	0.000	0.000	2.903
NNW	0.000	0.000	0.286	0.428	0.571	1.618	0.048	0.000	0.000	2.951
SUBTOTAL	0.000	0.524	6.949	8.710	6.901	9.757	0.666	0.000	0.000	33.508

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2103
TOTAL HOURS OF STABILITY CLASS D	705
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS D	704
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2101
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/05/14

MEAN WIND SPEED = 5.99

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

2002 WATTS BAR NUCLEAR PLANT EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS E (-0.5< DELTA T<= 1.5 C/100 M)

Watts Bar Nuclear Plant

JAN 1, 2002 - MAR 31, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.286	0.762	0.666	0.190	0.095	0.000	0.000	1.999
NNE	0.000	0.143	0.238	0.666	0.381	0.000	0.000	0.000	0.000	1.428
NE	0.000	0.000	0.333	0.381	0.048	0.000	0.000	0.000	0.000	0.762
ENE	0.000	0.000	0.428	0.095	0.000	0.000	0.000	0.000	0.000	0.524
E	0.000	0.190	0.286	0.048	0.000	0.000	0.000	0.000	0.000	0.524
ESE	0.000	0.095	0.190	0.048	0.000	0.000	0.000	0.000	0.000	0.333
SE	0.000	0.190	0.095	0.048	0.095	0.000	0.000	0.000	0.000	0.428
SSE	0.000	0.095	0.428	0.333	0.048	0.000	0.000	0.000	0.000	0.904
S	0.000	0.238	0.714	0.381	0.286	0.286	0.000	0.000	0.000	1.904
SSW	0.000	0.190	1.000	1.523	1.095	1.000	0.286	0.000	0.000	5.093
SW	0.000	0.238	0.714	0.619	0.143	0.048	0.000	0.000	0.000	1.761
WSW	0.000	0.333	0.714	0.143	0.190	0.048	0.000	0.000	0.000	1.428
W	0.000	0.381	0.524	0.143	0.000	0.190	0.000	0.000	0.000	1.238
WNW	0.000	0.428	0.571	0.333	0.048	0.428	0.000	0.000	0.000	1.809
NW	0.000	0.238	0.524	0.476	0.286	0.190	0.000	0.000	0.000	1.713
NNW	0.000	0.095	0.476	1.000	0.571	0.524	0.238	0.000	0.000	2.903
SUBTOTAL	0.000	2.856	7.520	6.997	3.855	2.903	0.619	0.000	0.000	24.750

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2103
TOTAL HOURS OF STABILITY CLASS E	520
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS E	520
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2101
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED 2002/05/14

MEAN WIND SPEED = 4.53

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

2002 WATTS BAR NUCLEAR PLANT EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS F (1.5< DELTA T<= 4.0 C/100 M)

Watts Bar Nuclear Plant

JAN 1, 2002 - MAR 31, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.001	0.095	0.143	0.000	0.000	0.000	0.000	0.000	0.000	0.239
NNE	0.001	0.000	0.143	0.000	0.000	0.000	0.000	0.000	0.000	0.143
NE	0.001	0.048	0.143	0.048	0.000	0.000	0.000	0.000	0.000	0.239
ENE	0.001	0.048	0.238	0.000	0.000	0.000	0.000	0.000	0.000	0.287
E	0.001	0.048	0.143	0.000	0.000	0.000	0.000	0.000	0.000	0.191
ESE	0.001	0.095	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.143
SE	0.000	0.048	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.096
SSE	0.001	0.000	0.190	0.048	0.000	0.000	0.000	0.000	0.000	0.239
S	0.002	0.048	0.428	0.143	0.048	0.000	0.000	0.000	0.000	0.669
SSW	0.005	0.286	0.904	0.762	0.095	0.048	0.000	0.000	0.000	2.100
SW	0.007	0.619	1.000	0.095	0.000	0.000	0.000	0.000	0.000	1.721
WSW	0.006	0.666	0.619	0.143	0.000	0.000	0.000	0.000	0.000	1.434
W	0.008	0.762	1.047	0.000	0.000	0.000	0.000	0.000	0.000	1.817
WNW	0.005	0.809	0.238	0.000	0.000	0.000	0.000	0.000	0.000	1.052
NW	0.005	0.571	0.524	0.000	0.000	0.000	0.000	0.000	0.000	1.100
NNW	0.002	0.333	0.143	0.048	0.000	0.000	0.000	0.000	0.000	0.526
SUBTOTAL	0.048	4.474	5.997	1.285	0.143	0.048	0.000	0.000	0.000	11.994

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2103
TOTAL HOURS OF STABILITY CLASS F	252
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS F	252
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2101
TOTAL HOURS CALM	1

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/05/14

MEAN WIND SPEED = 2.07

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS G (DELTA T > 4.0 C/100 M)

Watts Bar Nuclear Plant

JAN 1, 2002 - MAR 31, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.012	0.333	0.286	0.000	0.000	0.000	0.000	0.000	0.000	0.630
NNE	0.009	0.095	0.381	0.000	0.000	0.000	0.000	0.000	0.000	0.485
NE	0.008	0.286	0.143	0.000	0.000	0.000	0.000	0.000	0.000	0.436
ENE	0.010	0.238	0.286	0.000	0.000	0.000	0.000	0.000	0.000	0.533
E	0.008	0.286	0.143	0.000	0.000	0.000	0.000	0.000	0.000	0.436
ESE	0.001	0.000	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.048
SE	0.004	0.095	0.095	0.000	0.000	0.000	0.000	0.000	0.000	0.194
SSE	0.007	0.381	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.388
S	0.014	0.333	0.428	0.048	0.000	0.000	0.000	0.000	0.000	0.823
SSW	0.029	1.000	0.524	0.000	0.000	0.000	0.000	0.000	0.000	1.552
SW	0.037	1.047	0.904	0.000	0.000	0.000	0.000	0.000	0.000	1.988
WSW	0.063	2.189	1.190	0.048	0.000	0.000	0.000	0.000	0.000	3.490
W	0.039	1.238	0.857	0.000	0.000	0.000	0.000	0.000	0.000	2.134
WNW	0.018	0.666	0.286	0.000	0.000	0.000	0.000	0.000	0.000	0.970
NW	0.015	0.571	0.238	0.000	0.000	0.000	0.000	0.000	0.000	0.824
NNW	0.012	0.476	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.679
SUBTOTAL	0.286	9.234	5.997	0.095	0.000	0.000	0.000	0.000	0.000	15.612

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2103
TOTAL HOURS OF STABILITY CLASS G	328
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS G	328
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2101
TOTAL HOURS CALM	6

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/05/14

MEAN WIND SPEED = 1.39

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS A (DELTA T<=-1.9 C/100 M)

Watts Bar Nuclear Plant

APR 1, 2002 - JUN 30, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.000	0.139	0.279	0.000	0.000	0.000	0.418
NNE	0.000	0.000	0.000	0.093	0.279	0.371	0.000	0.000	0.000	0.743
NE	0.000	0.000	0.046	0.000	0.046	0.186	0.000	0.000	0.000	0.279
ENE	0.000	0.000	0.000	0.093	0.093	0.046	0.000	0.000	0.000	0.232
E	0.000	0.000	0.046	0.046	0.000	0.000	0.000	0.000	0.000	0.093
ESE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SSE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	0.000	0.000	0.000	0.000	0.000	0.139	0.000	0.000	0.000	0.139
SSW	0.000	0.000	0.000	0.046	0.093	0.232	0.000	0.000	0.000	0.371
SW	0.000	0.000	0.000	0.000	0.000	0.046	0.000	0.000	0.000	0.046
WSW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WNW	0.000	0.000	0.000	0.046	0.000	0.000	0.000	0.000	0.000	0.046
NW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NNW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUBTOTAL	0.000	0.000	0.093	0.325	0.650	1.300	0.000	0.000	0.000	2.368

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2161
TOTAL HOURS OF STABILITY CLASS A	51
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS A	51
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2154
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/08/09

MEAN WIND SPEED = 7.54

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

2002 WATTS BAR NUCLEAR PLANT EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS B (-1.9< DELTA T<=-1.7 C/100 M)

Watts Bar Nuclear Plant

APR 1, 2002 - JUN 30, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.046	0.093	0.279	0.000	0.000	0.000	0.418
NNE	0.000	0.000	0.046	0.186	0.325	0.511	0.000	0.000	0.000	1.068
NE	0.000	0.000	0.093	0.186	0.000	0.139	0.000	0.000	0.000	0.418
ENE	0.000	0.000	0.000	0.093	0.000	0.000	0.000	0.000	0.000	0.093
E	0.000	0.000	0.000	0.093	0.000	0.000	0.000	0.000	0.000	0.093
ESE	0.000	0.000	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.046
SE	0.000	0.000	0.000	0.046	0.000	0.000	0.000	0.000	0.000	0.046
SSE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	0.000	0.000	0.000	0.000	0.000	0.093	0.000	0.000	0.000	0.093
SSW	0.000	0.000	0.000	0.046	0.325	0.418	0.000	0.000	0.000	0.789
SW	0.000	0.000	0.000	0.000	0.046	0.046	0.000	0.000	0.000	0.093
WSW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WNW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NW	0.000	0.000	0.000	0.046	0.093	0.139	0.000	0.000	0.000	0.279
NNW	0.000	0.000	0.000	0.000	0.046	0.139	0.000	0.000	0.000	0.186
SUBTOTAL	0.000	0.000	0.186	0.789	0.929	1.764	0.000	0.000	0.000	3.668

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2161
TOTAL HOURS OF STABILITY CLASS B	79
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS B	79
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2154
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/08/09

MEAN WIND SPEED = 7.37

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

2002 WATTS BAR NUCLEAR PLANT EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS C (-1.7 < DELTA T <= -1.5 C/100 M)

Watts Bar Nuclear Plant

APR 1, 2002 - JUN 30, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.325	0.186	0.418	0.000	0.000	0.000	0.929
NNE	0.000	0.000	0.139	0.371	0.279	0.371	0.046	0.000	0.000	1.207
NE	0.000	0.000	0.093	0.139	0.000	0.093	0.000	0.000	0.000	0.325
ENE	0.000	0.000	0.186	0.139	0.046	0.000	0.000	0.000	0.000	0.371
E	0.000	0.000	0.046	0.046	0.000	0.000	0.000	0.000	0.000	0.093
ESE	0.000	0.000	0.186	0.046	0.000	0.000	0.000	0.000	0.000	0.232
SE	0.000	0.000	0.046	0.000	0.046	0.000	0.000	0.000	0.000	0.093
SSE	0.000	0.000	0.046	0.232	0.046	0.046	0.000	0.000	0.000	0.371
S	0.000	0.000	0.093	0.279	0.232	0.186	0.093	0.000	0.000	0.882
SSW	0.000	0.000	0.000	0.186	0.650	0.743	0.046	0.000	0.000	1.625
SW	0.000	0.000	0.000	0.186	0.232	0.093	0.000	0.000	0.000	0.511
WSW	0.000	0.000	0.000	0.046	0.000	0.000	0.000	0.000	0.000	0.046
W	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WNW	0.000	0.000	0.046	0.000	0.046	0.046	0.046	0.000	0.000	0.186
NW	0.000	0.000	0.046	0.000	0.186	0.186	0.000	0.000	0.000	0.418
NNW	0.000	0.000	0.046	0.093	0.046	0.232	0.000	0.000	0.000	0.418
SUBTOTAL	0.000	0.000	0.975	2.089	1.996	2.414	0.232	0.000	0.000	7.707

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2161
TOTAL HOURS OF STABILITY CLASS C	166
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS C	166
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2154
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/08/09

MEAN WIND SPEED = 6.62

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS D (-1.5< DELTA T<=-0.5 C/100 M)

Watts Bar Nuclear Plant

APR 1, 2002 - JUN 30, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.002	0.000	0.418	1.021	0.789	1.625	0.000	0.000	0.000	3.855
NNE	0.002	0.000	0.464	1.068	0.604	0.836	0.000	0.000	0.000	2.973
NE	0.002	0.000	0.511	0.557	0.418	0.046	0.000	0.000	0.000	1.534
ENE	0.002	0.093	0.279	0.186	0.186	0.000	0.000	0.000	0.000	0.744
E	0.001	0.093	0.186	0.139	0.046	0.000	0.000	0.000	0.000	0.466
ESE	0.001	0.046	0.139	0.000	0.000	0.000	0.000	0.000	0.000	0.187
SE	0.003	0.093	0.464	0.093	0.046	0.000	0.000	0.000	0.000	0.699
SSE	0.004	0.139	0.789	0.325	0.046	0.093	0.046	0.000	0.000	1.443
S	0.007	0.279	1.253	1.439	0.279	0.464	0.325	0.000	0.000	4.046
SSW	0.009	0.046	1.996	3.250	2.089	2.275	0.093	0.000	0.000	9.759
SW	0.006	0.093	1.207	1.811	0.418	0.046	0.000	0.000	0.000	3.581
WSW	0.003	0.046	0.511	0.418	0.186	0.000	0.000	0.000	0.000	1.163
W	0.001	0.046	0.093	0.139	0.139	0.046	0.000	0.000	0.000	0.465
WNW	0.001	0.000	0.325	0.464	0.093	0.139	0.000	0.000	0.000	1.023
NW	0.001	0.046	0.279	0.186	0.511	0.186	0.046	0.000	0.000	1.255
NNW	0.001	0.000	0.325	0.371	0.464	0.604	0.000	0.000	0.000	1.766
SUBTOTAL	0.046	1.021	9.239	11.467	6.314	6.360	0.511	0.000	0.000	34.958

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2161
TOTAL HOURS OF STABILITY CLASS D	757
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS D	753
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2154
TOTAL HOURS CALM	1

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED 2002/08/09

MEAN WIND SPEED = 5.24

NOTE. TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS E (-0.5 < DELTA T <= 1.5 C/100 M)

Watts Bar Nuclear Plant

APR 1, 2002 - JUN 30, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.464	0.836	0.511	0.000	0.000	0.000	0.000	1.811
NNE	0.000	0.000	0.139	0.279	0.093	0.000	0.000	0.000	0.000	0.511
NE	0.000	0.139	0.604	0.046	0.000	0.000	0.000	0.000	0.000	0.836
ENE	0.000	0.046	0.418	0.186	0.000	0.000	0.000	0.000	0.000	0.650
E	0.000	0.186	0.371	0.000	0.000	0.000	0.000	0.000	0.000	0.557
ESE	0.000	0.325	0.139	0.000	0.000	0.000	0.000	0.000	0.000	0.464
SE	0.000	0.139	0.093	0.139	0.046	0.046	0.000	0.000	0.000	0.464
SSE	0.000	0.186	0.418	0.093	0.139	0.000	0.000	0.000	0.000	0.836
S	0.000	0.325	0.650	0.371	0.186	0.371	0.000	0.000	0.000	1.903
SSW	0.000	0.464	2.182	1.903	1.114	0.418	0.000	0.000	0.000	6.082
SW	0.000	0.511	1.625	0.325	0.232	0.093	0.000	0.000	0.000	2.786
WSW	0.000	0.650	0.789	0.093	0.046	0.046	0.000	0.000	0.000	1.625
W	0.000	0.371	0.557	0.139	0.046	0.000	0.000	0.000	0.000	1.114
WNW	0.000	0.325	0.279	0.279	0.046	0.000	0.000	0.000	0.000	0.929
NW	0.000	0.093	0.371	0.279	0.000	0.046	0.000	0.000	0.000	0.789
NNW	0.000	0.046	0.139	0.650	0.743	0.279	0.000	0.000	0.000	1.857
SUBTOTAL	0.000	3.807	9.239	5.617	3.250	1.300	0.000	0.000	0.000	23.213

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2161
TOTAL HOURS OF STABILITY CLASS E	502
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS E	500
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2154
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/08/09

MEAN WIND SPEED = 3.58

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS F (1.5< DELTA T<= 4.0 C/100 M)

Watts Bar Nuclear Plant

APR 1, 2002 - JUN 30, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.093	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.139
NNE	0.000	0.139	0.279	0.000	0.000	0.000	0.000	0.000	0.000	0.418
NE	0.000	0.046	0.046	0.046	0.000	0.000	0.000	0.000	0.000	0.139
ENE	0.000	0.139	0.371	0.000	0.000	0.000	0.000	0.000	0.000	0.511
E	0.000	0.186	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.232
ESE	0.000	0.186	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.186
SE	0.000	0.186	0.139	0.000	0.000	0.000	0.000	0.000	0.000	0.325
SSE	0.000	0.279	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.279
S	0.000	0.464	0.232	0.046	0.000	0.000	0.000	0.000	0.000	0.743
SSW	0.000	0.464	0.696	0.232	0.000	0.000	0.000	0.000	0.000	1.393
SW	0.000	1.161	0.789	0.000	0.046	0.000	0.000	0.000	0.000	1.996
WSW	0.000	1.439	0.882	0.000	0.000	0.000	0.000	0.000	0.000	2.321
W	0.000	1.300	0.743	0.000	0.000	0.000	0.000	0.000	0.000	2.043
WNW	0.000	1.021	0.789	0.232	0.000	0.000	0.000	0.000	0.000	2.043
NW	0.000	0.696	0.418	0.046	0.000	0.000	0.000	0.000	0.000	1.161
NNW	0.000	0.186	0.139	0.093	0.000	0.000	0.000	0.000	0.000	0.418
SUBTOTAL	0.000	7.985	5.617	0.696	0.046	0.000	0.000	0.000	0.000	14.345

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2161
TOTAL HOURS OF STABILITY CLASS F	310
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS F	309
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2154
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/08/09

MEAN WIND SPEED = 1.62

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS G (DELTA T > 4.0 C/100 M)

Watts Bar Nuclear Plant

APR 1, 2002 - JUN 30, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.046	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.093
NNE	0.000	0.046	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.139
NE	0.000	0.093	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.139
ENE	0.000	0.046	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.093
E	0.000	0.186	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.232
ESE	0.000	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046
SE	0.000	0.139	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.139
SSE	0.000	0.046	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.093
S	0.000	0.325	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.418
SSW	0.000	0.929	0.186	0.000	0.000	0.000	0.000	0.000	0.000	1.114
SW	0.000	1.486	0.371	0.000	0.000	0.000	0.000	0.000	0.000	1.857
WSW	0.000	1.671	1.161	0.000	0.000	0.000	0.000	0.000	0.000	2.832
W	0.000	1.532	0.789	0.000	0.000	0.000	0.000	0.000	0.000	2.321
WNW	0.000	1.393	0.789	0.046	0.000	0.000	0.000	0.000	0.000	2.228
NW	0.000	0.929	0.604	0.000	0.000	0.000	0.000	0.000	0.000	1.532
NNW	0.000	0.325	0.093	0.046	0.000	0.000	0.000	0.000	0.000	0.464
SUBTOTAL	0.000	9.239	4.410	0.093	0.000	0.000	0.000	0.000	0.000	13.742

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2161
TOTAL HOURS OF STABILITY CLASS G	296
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS G	296
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2154
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/08/09

MEAN WIND SPEED = 1.37

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS A (DELTA T<=-1.9 C/100 M)

Watts Bar Nuclear Plant

JUL 1, 2002 - SEP 30, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.233	0.327	0.327	0.000	0.000	0.000	0.887
NNE	0.000	0.000	0.000	0.093	0.654	0.373	0.000	0.000	0.000	1.120
NE	0.000	0.000	0.047	0.233	0.093	0.280	0.000	0.000	0.000	0.654
ENE	0.000	0.000	0.000	0.140	0.093	0.187	0.000	0.000	0.000	0.420
E	0.000	0.000	0.000	0.140	0.000	0.000	0.000	0.000	0.000	0.140
ESE	0.000	0.000	0.000	0.093	0.000	0.000	0.000	0.000	0.000	0.093
SE	0.000	0.000	0.047	0.047	0.000	0.047	0.000	0.000	0.000	0.140
SSE	0.000	0.000	0.000	0.093	0.000	0.187	0.000	0.000	0.000	0.280
S	0.000	0.000	0.000	0.280	0.280	0.093	0.000	0.000	0.000	0.654
SSW	0.000	0.000	0.000	0.327	0.840	0.233	0.000	0.000	0.000	1.401
SW	0.000	0.000	0.047	0.373	0.280	0.000	0.000	0.000	0.000	0.700
WSW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W	0.000	0.000	0.047	0.047	0.000	0.000	0.000	0.000	0.000	0.093
WNW	0.000	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.047
NW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NNW	0.000	0.000	0.000	0.047	0.093	0.233	0.000	0.000	0.000	0.373
SUBTOTAL	0.000	0.000	0.187	2.194	2.661	1.961	0.000	0.000	0.000	7.003

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2149
TOTAL HOURS OF STABILITY CLASS A	150
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS A	150
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2142
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/11/18

MEAN WIND SPEED = 6.45

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS B (-1.9 < DELTA T < -1.7 C/100 M)

Watts Bar Nuclear Plant

JUL 1, 2002 - SEP 30, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.047	0.233	0.187	0.140	0.000	0.000	0.000	0.607
NNE	0.000	0.000	0.000	0.233	0.233	0.280	0.000	0.000	0.000	0.747
NE	0.000	0.000	0.093	0.560	0.187	0.000	0.000	0.000	0.000	0.840
ENE	0.000	0.000	0.000	0.373	0.000	0.093	0.000	0.000	0.000	0.467
E	0.000	0.000	0.047	0.280	0.047	0.000	0.000	0.000	0.000	0.373
ESE	0.000	0.000	0.047	0.093	0.000	0.000	0.000	0.000	0.000	0.140
SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SSE	0.000	0.000	0.000	0.000	0.000	0.047	0.000	0.000	0.000	0.047
S	0.000	0.000	0.000	0.280	0.047	0.093	0.000	0.000	0.000	0.420
SSW	0.000	0.000	0.000	0.514	0.327	0.000	0.000	0.000	0.000	0.840
SW	0.000	0.000	0.000	0.420	0.140	0.000	0.000	0.000	0.000	0.560
WSW	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.047
W	0.000	0.000	0.047	0.047	0.047	0.000	0.000	0.000	0.000	0.140
WNN	0.000	0.000	0.000	0.047	0.093	0.000	0.000	0.000	0.000	0.140
NW	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.047
NNW	0.000	0.000	0.000	0.093	0.140	0.140	0.000	0.000	0.000	0.373
SUBTOTAL	0.000	0.000	0.373	3.175	1.447	0.794	0.000	0.000	0.000	5.789

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2149
TOTAL HOURS OF STABILITY CLASS B	124
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS B	124
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2142
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/11/18

MEAN WIND SPEED = 5.42

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS C (-1.7< DELTA T<=-1.5 C/100 M)

Watts Bar Nuclear Plant

JUL 1, 2002 - SEP 30, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.140	0.233	0.187	0.093	0.000	0.000	0.000	0.654
NNE	0.000	0.000	0.093	0.233	0.233	0.187	0.000	0.000	0.000	0.747
NE	0.000	0.000	0.187	0.327	0.047	0.093	0.000	0.000	0.000	0.654
ENE	0.000	0.000	0.000	0.233	0.047	0.000	0.000	0.000	0.000	0.280
E	0.000	0.000	0.047	0.047	0.000	0.000	0.000	0.000	0.000	0.093
ESE	0.000	0.000	0.093	0.093	0.047	0.000	0.000	0.000	0.000	0.233
SE	0.000	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.047
SSE	0.000	0.000	0.047	0.140	0.000	0.000	0.000	0.000	0.000	0.187
S	0.000	0.000	0.093	0.607	0.000	0.093	0.000	0.000	0.000	0.794
SSW	0.000	0.000	0.140	0.747	0.560	0.000	0.000	0.000	0.000	1.447
SW	0.000	0.000	0.047	0.280	0.140	0.000	0.000	0.000	0.000	0.467
WSW	0.000	0.047	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.093
W	0.000	0.000	0.000	0.047	0.093	0.000	0.000	0.000	0.000	0.140
WNW	0.000	0.000	0.047	0.047	0.093	0.047	0.000	0.000	0.000	0.233
NW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NNW	0.000	0.000	0.093	0.140	0.093	0.047	0.000	0.000	0.000	0.373
SUBTOTAL	0.000	0.047	1.074	3.221	1.541	0.560	0.000	0.000	0.000	6.443

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2149
TOTAL HOURS OF STABILITY CLASS C	138
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS C	138
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2142
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY - Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/11/18

MEAN WIND SPEED = 4.99

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS D (-1.5< DELTA T<=-0.5 C/100 M)

Watts Bar Nuclear Plant

JUL 1, 2002 - SEP 30, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.047	0.467	0.700	0.840	0.233	0.000	0.000	0.000	2.288
NNE	0.000	0.000	0.514	1.027	1.167	1.214	0.047	0.000	0.000	3.968
NE	0.000	0.000	0.654	1.027	0.654	0.187	0.000	0.000	0.000	2.521
ENE	0.000	0.000	1.214	0.607	0.280	0.233	0.000	0.000	0.000	2.334
E	0.000	0.047	0.654	0.140	0.093	0.000	0.000	0.000	0.000	0.934
ESE	0.000	0.093	0.467	0.140	0.000	0.000	0.000	0.000	0.000	0.700
SE	0.000	0.000	0.373	0.140	0.047	0.000	0.000	0.000	0.000	0.560
SSE	0.000	0.093	0.654	0.187	0.187	0.093	0.000	0.000	0.000	1.214
S	0.000	0.047	1.120	1.120	0.280	0.280	0.000	0.000	0.000	2.848
SSW	0.000	0.140	1.961	2.194	0.560	0.327	0.000	0.000	0.000	5.182
SW	0.000	0.093	0.794	1.074	0.093	0.000	0.000	0.000	0.000	2.054
WSW	0.000	0.093	0.420	0.280	0.093	0.000	0.000	0.000	0.000	0.887
W	0.000	0.140	0.280	0.140	0.000	0.000	0.000	0.000	0.000	0.560
WNW	0.000	0.000	0.654	0.373	0.093	0.000	0.000	0.000	0.000	1.120
NW	0.000	0.000	0.187	0.280	0.047	0.093	0.000	0.000	0.000	0.607
NNW	0.000	0.000	0.373	0.233	0.140	0.047	0.000	0.000	0.000	0.794
SUBTOTAL	0.000	0.794	10.784	9.664	4.575	2.708	0.047	0.000	0.000	28.571

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2149
TOTAL HOURS OF STABILITY CLASS D	616
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS D	612
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2142
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED. 2002/11/18

MEAN WIND SPEED = 4.37

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS E (-0.5< DELTA T<= 1.5 C/100 M)

Watts Bar Nuclear Plant

JUL 1, 2002 - SEP 30, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.003	0.047	0.607	0.980	0.514	0.000	0.000	0.000	0.000	2.150
NNE	0.002	0.000	0.420	0.140	0.327	0.093	0.000	0.000	0.000	0.982
NE	0.004	0.047	0.934	0.467	0.140	0.000	0.000	0.000	0.000	1.592
ENE	0.005	0.000	1.027	0.560	0.000	0.000	0.000	0.000	0.000	1.592
E	0.002	0.047	0.373	0.047	0.000	0.047	0.000	0.000	0.000	0.515
ESE	0.002	0.327	0.140	0.047	0.000	0.000	0.000	0.000	0.000	0.516
SE	0.002	0.140	0.233	0.047	0.000	0.000	0.000	0.000	0.000	0.422
SSE	0.003	0.420	0.327	0.093	0.047	0.047	0.000	0.000	0.000	0.937
S	0.007	0.467	1.167	0.373	0.000	0.093	0.000	0.000	0.000	2.108
SSW	0.012	0.607	2.007	1.027	0.093	0.140	0.000	0.000	0.000	3.887
SW	0.011	0.514	2.007	0.233	0.000	0.000	0.000	0.000	0.000	2.766
WSW	0.012	1.167	1.587	0.093	0.000	0.000	0.000	0.000	0.000	2.860
W	0.009	1.167	0.934	0.140	0.000	0.047	0.000	0.000	0.000	2.297
WNW	0.008	0.794	0.934	0.140	0.047	0.000	0.000	0.000	0.000	1.922
NW	0.006	0.607	0.700	0.140	0.093	0.000	0.000	0.000	0.000	1.546
NNW	0.005	0.280	0.794	0.373	0.187	0.000	0.000	0.000	0.000	1.639
SUBTOTAL	0.093	6.629	14.192	4.902	1.447	0.467	0.000	0.000	0.000	27.731

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2149
TOTAL HOURS OF STABILITY CLASS E	596
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS E	594
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2142
TOTAL HOURS CALM	2

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/11/18

MEAN WIND SPEED = 2.61

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS F (1.5< DELTA T<= 4.0 C/100 M)

Watts Bar Nuclear Plant

JUL 1, 2002 - SEP 30, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.280	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.514
NNE	0.000	0.047	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.280
NE	0.000	0.187	0.140	0.047	0.000	0.000	0.000	0.000	0.000	0.373
ENE	0.000	0.280	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.467
E	0.000	0.047	0.187	0.047	0.000	0.000	0.000	0.000	0.000	0.280
ESE	0.000	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.140
SE	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.047
SSE	0.000	0.140	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.187
S	0.000	0.233	0.233	0.047	0.000	0.000	0.000	0.000	0.000	0.514
SSW	0.000	0.467	0.840	0.000	0.000	0.000	0.000	0.000	0.000	1.307
SW	0.000	0.980	1.167	0.000	0.000	0.000	0.000	0.000	0.000	2.148
WSW	0.000	1.354	1.354	0.000	0.000	0.000	0.000	0.000	0.000	2.708
W	0.000	1.587	0.794	0.000	0.000	0.000	0.000	0.000	0.000	2.381
WNW	0.000	1.821	0.607	0.000	0.000	0.000	0.000	0.000	0.000	2.428
NW	0.000	0.934	0.280	0.047	0.000	0.000	0.000	0.000	0.000	1.261
NNW	0.000	0.373	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.560
SUBTOTAL	0.000	8.870	6.536	0.187	0.000	0.000	0.000	0.000	0.000	15.593

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2149
TOTAL HOURS OF STABILITY CLASS F	335
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS F	334
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2142
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/11/18

MEAN WIND SPEED = 1.50

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS G (DELTA T > 4.0 C/100 M)

Watts Bar Nuclear Plant

JUL 1, 2002 - SEP 30, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.093
NNE	0.000	0.093	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.187
NE	0.000	0.047	0.047	0.047	0.000	0.000	0.000	0.000	0.000	0.140
ENE	0.000	0.093	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.140
E	0.000	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.093
ESE	0.000	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187
SE	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047
SSE	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047
S	0.000	0.093	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.187
SSW	0.000	0.187	0.280	0.000	0.000	0.000	0.000	0.000	0.000	0.467
SW	0.000	0.467	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.700
WSW	0.000	1.167	0.420	0.000	0.000	0.000	0.000	0.000	0.000	1.587
W	0.000	1.727	0.607	0.000	0.000	0.000	0.000	0.000	0.000	2.334
WNW	0.000	0.980	0.514	0.000	0.000	0.000	0.000	0.000	0.000	1.494
NW	0.000	0.700	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.887
NNW	0.000	0.093	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.280
SUBTOTAL	0.000	6.116	2.708	0.047	0.000	0.000	0.000	0.000	0.000	8.870

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2149
TOTAL HOURS OF STABILITY CLASS G	190
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS G	190
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2142
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2002/11/18

MEAN WIND SPEED = 1.35

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS A (DELTA T<=-1.9 C/100 M)

Watts Bar Nuclear Plant

OCT 1, 2002 - DEC 31, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NNE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ENE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
E	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SSE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	0.000	0.000	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.045
SSW	0.000	0.000	0.045	0.045	0.000	0.182	0.000	0.000	0.000	0.273
SW	0.000	0.000	0.000	0.045	0.000	0.000	0.000	0.000	0.000	0.045
WSW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WNW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NNW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUBTOTAL	0.000	0.000	0.091	0.091	0.000	0.182	0.000	0.000	0.000	0.364

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2203
TOTAL HOURS OF STABILITY CLASS A	8
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS A	8
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2199
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2003/02/13

MEAN WIND SPEED = 6.85

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS B (-1.9 < DELTA T <=-1.7 C/100 M)

Watts Bar Nuclear Plant

OCT 1, 2002 - DEC 31, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.045	0.000	0.045	0.000	0.000	0.000	0.091
NNE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NE	0.000	0.000	0.000	0.045	0.000	0.000	0.000	0.000	0.000	0.045
ENE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
E	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SSE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	0.000	0.000	0.000	0.091	0.045	0.000	0.000	0.000	0.000	0.136
SSW	0.000	0.000	0.000	0.045	0.273	0.409	0.045	0.000	0.000	0.773
SW	0.000	0.000	0.000	0.045	0.045	0.045	0.000	0.000	0.000	0.136
WSW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W	0.000	0.000	0.000	0.000	0.000	0.045	0.045	0.000	0.000	0.091
WNW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NNW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUBTOTAL	0.000	0.000	0.000	0.273	0.364	0.546	0.091	0.000	0.000	1.273

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2203
TOTAL HOURS OF STABILITY CLASS B	29
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS B	28
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2199
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2003/02/13

MEAN WIND SPEED = 7.44

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS C (-1.7< DELTA T<=-1.5 C/100 M)

Watts Bar Nuclear Plant

OCT 1, 2002 - DEC 31, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.000	0.000	0.091	0.045	0.000	0.000	0.000	0.136
NNE	0.000	0.000	0.000	0.091	0.091	0.045	0.000	0.000	0.000	0.227
NE	0.000	0.000	0.045	0.045	0.045	0.000	0.000	0.000	0.000	0.136
ENE	0.000	0.000	0.045	0.045	0.000	0.000	0.000	0.000	0.000	0.091
E	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ESE	0.000	0.000	0.000	0.045	0.000	0.000	0.000	0.000	0.000	0.045
SE	0.000	0.000	0.045	0.045	0.000	0.000	0.000	0.000	0.000	0.091
SSE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	0.000	0.000	0.045	0.182	0.136	0.000	0.000	0.000	0.000	0.364
SSW	0.000	0.000	0.000	0.045	0.364	0.227	0.000	0.000	0.000	0.637
SW	0.000	0.000	0.000	0.136	0.091	0.000	0.000	0.000	0.000	0.227
WSW	0.000	0.000	0.000	0.000	0.000	0.091	0.000	0.000	0.000	0.091
W	0.000	0.000	0.000	0.000	0.000	0.136	0.045	0.000	0.000	0.182
WNW	0.000	0.000	0.000	0.045	0.045	0.000	0.045	0.000	0.000	0.136
NW	0.000	0.000	0.000	0.000	0.136	0.000	0.000	0.000	0.000	0.136
NNW	0.000	0.000	0.000	0.045	0.045	0.136	0.045	0.000	0.000	0.273
SUBTOTAL	0.000	0.000	0.182	0.728	1.046	0.682	0.136	0.000	0.000	2.774

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2203
TOTAL HOURS OF STABILITY CLASS C	62
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS C	61
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2199
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2003/02/13

MEAN WIND SPEED = 6.58

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS D (-1.5< DELTA T<=-0.5 C/100 M)

Watts Bar Nuclear Plant

OCT 1, 2002 - DEC 31, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.182	0.773	1.637	1.228	1.864	0.000	0.000	0.000	5.684
NNE	0.000	0.045	1.182	1.728	1.364	1.319	0.000	0.000	0.000	5.639
NE	0.000	0.000	1.137	1.182	0.091	0.318	0.000	0.000	0.000	2.729
ENE	0.000	0.182	1.091	0.819	0.091	0.000	0.000	0.000	0.000	2.183
E	0.000	0.182	0.728	0.182	0.000	0.000	0.000	0.000	0.000	1.091
ESE	0.000	0.045	0.273	0.045	0.000	0.000	0.000	0.000	0.000	0.364
SE	0.000	0.000	0.409	0.000	0.000	0.000	0.000	0.000	0.000	0.409
SSE	0.000	0.091	0.728	0.091	0.000	0.000	0.000	0.000	0.000	0.910
S	0.000	0.227	1.546	1.000	0.136	0.409	0.000	0.000	0.000	3.320
SSW	0.000	0.227	1.819	3.001	1.182	0.955	0.045	0.000	0.000	7.231
SW	0.000	0.227	1.046	1.091	0.364	0.045	0.000	0.000	0.000	2.774
WSW	0.000	0.227	0.546	0.273	0.091	0.000	0.000	0.000	0.000	1.137
W	0.000	0.318	0.455	0.318	0.364	0.455	0.045	0.000	0.000	1.955
WNW	0.000	0.182	0.500	0.364	0.728	0.546	0.000	0.000	0.000	2.319
NW	0.000	0.182	0.819	0.409	1.501	1.364	0.091	0.000	0.000	4.366
NNW	0.000	0.227	0.819	0.728	1.637	2.092	0.000	0.000	0.000	5.503
SUBTOTAL	0.000	2.547	13.870	12.869	8.777	9.368	0.182	0.000	0.000	47.613

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2203
TOTAL HOURS OF STABILITY CLASS D	1049
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS D	1047
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2199
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2003/02/13

MEAN WIND SPEED = 4.94

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS E (-0.5 < DELTA T <= 1.5 C/100 M)

Watts Bar Nuclear Plant

OCT 1, 2002 - DEC 31, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.273	0.728	0.682	0.182	0.000	0.000	0.000	0.000	1.864
NNE	0.000	0.091	0.409	0.136	0.136	0.091	0.000	0.000	0.000	0.864
NE	0.000	0.182	0.682	0.364	0.091	0.000	0.000	0.000	0.000	1.319
ENE	0.000	0.091	0.728	0.136	0.000	0.000	0.000	0.000	0.000	0.955
E	0.000	0.091	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.591
ESE	0.000	0.091	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.136
SE	0.000	0.273	0.136	0.000	0.000	0.000	0.000	0.000	0.000	0.409
SSE	0.000	0.318	0.227	0.000	0.000	0.000	0.000	0.000	0.000	0.546
S	0.000	0.318	0.728	0.409	0.136	0.591	0.182	0.045	0.000	2.410
SSW	0.000	0.637	2.046	2.001	0.773	0.864	0.136	0.000	0.000	6.457
SW	0.000	0.455	1.137	0.409	0.364	0.091	0.000	0.000	0.000	2.456
WSW	0.000	0.864	0.773	0.273	0.045	0.091	0.000	0.000	0.000	2.046
W	0.000	1.046	0.910	0.136	0.000	0.045	0.000	0.000	0.000	2.137
WNW	0.000	0.318	1.000	0.455	0.182	0.045	0.000	0.000	0.000	2.001
NW	0.000	0.318	1.319	0.409	0.136	0.091	0.000	0.000	0.000	2.274
NNW	0.000	0.091	0.409	0.500	0.364	0.045	0.000	0.000	0.000	1.410
SUBTOTAL	0.000	5.457	11.778	5.912	2.410	1.955	0.318	0.045	0.000	27.876

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2203
TOTAL HOURS OF STABILITY CLASS E	613
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS E	613
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2199
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2003/02/13

MEAN WIND SPEED = 3.48

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS F (1.5< DELTA T<= 4.0 C/100 M)

Watts Bar Nuclear Plant

OCT 1, 2002 - DEC 31, 2002

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.091	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.182
NNE	0.000	0.045	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.091
NE	0.000	0.136	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.227
ENE	0.000	0.045	0.273	0.000	0.000	0.000	0.000	0.000	0.000	0.318
E	0.000	0.045	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.136
ESE	0.000	0.091	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.136
SE	0.000	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.091
SSE	0.000	0.000	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.045
S	0.000	0.136	0.364	0.000	0.000	0.000	0.000	0.000	0.000	0.500
SSW	0.000	0.546	0.864	0.091	0.045	0.000	0.000	0.000	0.000	1.546
SW	0.000	0.409	0.728	0.000	0.000	0.000	0.000	0.000	0.000	1.137
WSW	0.000	1.000	0.682	0.000	0.000	0.000	0.000	0.000	0.000	1.683
W	0.000	1.364	0.910	0.045	0.000	0.000	0.000	0.000	0.000	2.319
WNW	0.000	1.501	0.728	0.000	0.000	0.000	0.000	0.000	0.000	2.228
NW	0.000	1.182	0.864	0.091	0.000	0.000	0.000	0.000	0.000	2.137
NNW	0.000	0.364	0.227	0.045	0.000	0.000	0.000	0.000	0.000	0.637
SUBTOTAL	0.000	7.049	6.048	0.273	0.045	0.000	0.000	0.000	0.000	13.415

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2203
TOTAL HOURS OF STABILITY CLASS F	295
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS F	295
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2199
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2003/02/13

MEAN WIND SPEED = 1.60

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT**

JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY WIND DIRECTION FOR

STABILITY CLASS G (DELTA T > 4.0 C/100 M)

Watts Bar Nuclear Plant

OCT 1, 2002 - DEC 31, 2002

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.045	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.136
NNE	0.000	0.000	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.091
NE	0.000	0.182	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.227
ENE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
E	0.000	0.182	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.182
ESE	0.000	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.091
SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SSE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	0.000	0.136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.136
SSW	0.000	0.091	0.273	0.000	0.000	0.000	0.000	0.000	0.000	0.364
SW	0.000	0.455	0.273	0.000	0.000	0.000	0.000	0.000	0.000	0.728
WSW	0.000	0.637	0.546	0.000	0.000	0.000	0.000	0.000	0.000	1.182
W	0.000	0.773	0.455	0.000	0.000	0.000	0.000	0.000	0.000	1.228
WNW	0.000	0.910	0.364	0.000	0.000	0.000	0.000	0.000	0.000	1.273
NW	0.000	0.318	0.591	0.000	0.000	0.000	0.000	0.000	0.000	0.910
NNW	0.000	0.045	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.136
SUBTOTAL	0.000	3.865	2.819	0.000	0.000	0.000	0.000	0.000	0.000	6.685

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	2203
TOTAL HOURS OF STABILITY CLASS G	147
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS G	147
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	2199
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: Watts Bar Nuclear Plant
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

DATE PRINTED: 2003/02/13

MEAN WIND SPEED = 1.44

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

ATTACHMENT 1.0

Deviations from ODCM Controls/Surveillance Requirements

02/15/2002	1/2.1.2 Table 1.1-2 Item 4.c Action B	Unscheduled entry into ODCM 1.1.2 Condition B (0830, 2/15/02). Auxiliary Building Stack Flow, FI-90-300 declared inoperable while performing 1-SI-0-2B, Operations daily log. Exited after FI-90-300 reset (1035, 02/15/02). FI failed subsequent to the discharge damper on the 2A Auxiliary Building General Supply Fan closing at approximately 1828 on 2/14/02. At 1858, 02/14/02, the 2B Auxiliary Building Fan was shutdown. This left one Fuel Handling Exhaust Fan, and One Supply and One Exhaust fan in service at 2208. 02/14/02. The trip fuses for 2A Auxiliary Building General supply were replaced and the 2A Auxiliary Building general supply and exhaust fans were started. Compensatory measures to estimate release flow from 1828, 02/14/02 until the ODCM entry at 0830 02/15/02 were not performed.
4/02/2002	1/2.2.2 Table 2.2-2 Item K	The weekly particulate filter obtained from the Auxiliary Building Exhaust radiation monitor 0-RE-90-101 was found to have been torn and had signs that flow had been in both directions. The filter was counted qualitatively and Co-58 identified. The previous weeks filter also had Co-58 identified. The concentration of Co-58 that was identified on the previous weeks filter was used to quantify this weeks release.
04/19/2002	1/2.1.2 Table 1.2-2 Item B	A fuse to the isokinetic flow loop blew during replacement of an indicating light. The wrong action from the ODCM was entered. This resulted in one 4 hour interval of flow estimation from the Auxiliary Building Exhaust being missed.
05/05/2002	1/2.1.2 Table 1.2-2 Item G	ABGTS B Train was started while 2-RM-90-400 was declared inoperable in support of 0-ODI-90-83. The ABGTS B train was started to support a scheduled surveillance (0-SI-30-8-B). The ABGTS B train fan ran for 7 minutes before operations realized that this was not in compliance with the ODCM 1.1.2 Action G.
7/02/2002	1/2.2.2 Table 2.2-2 Item K	The weekly particulate filter obtained from the Auxiliary Building Exhaust radiation monitor 0-RE-90-101 was found to have been torn. The tear resulted in a non-representative sample. It was determined that the filter probably had been torn as a result of a worn and stretched O-ring. The O-ring was replaced and the filter counted qualitatively (no activity found) and the previous weeks filter and following weeks filter showed no activity.

2002
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

ATTACHMENT 2.0
Radiation Monitors Inoperable for Greater than 30 days

NONE

Enclosure 2

Watts Bar Nuclear Plant Process Control Program (PCP) Reporting Requirements

TVA's letter dated April 30, 2002, indicated that the requirements of the Process Control Program (PCP) were documented in Plant Administrative Instruction (PAI) 13.01, "Process Control Program." The PAI was replaced with an instruction titled "Process Control Program (PCP)" on May 14, 2002. Section 2.4.D.2 and Section 2.4.E of the PCP address the reporting requirements applicable to the PCP. Section 2.4.D.2 requires that revisions to the PCP, which occurred during the reporting period of the Annual Radioactive Effluent Release Report (ARERR), be forwarded to NRC with the ARERR. Based on this requirement and the transition of the PAI to the PCP instruction, attached is Revision 0 of the PCP instruction. Section 2.4.E of the PCP requires that major changes to the radiological waste treatment systems be reported in conjunction with the ARERR. For this reporting period, no major changes to the radiological waste treatment systems were made.

Attachment to Enclosure 2
Process Control Program Revision 0

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT

PCP

PROCESS CONTROL PROGRAM

REVISION 0

QUALITY RELATED

PREPARED BY: Cheryl Whitaker

DATE: 5/14/02

SPONSORING ORGANIZATION: Radwaste

APPROVED BY: ED Robinson

DATE: 5/14/02

EFFECTIVE DATE: 6/10/02

WBN UNIT 0	PROCESS CONTROL PROGRAM	PCP Revision 0 Page 2 of 11
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REVISION LOG

REVISION OR CHANGE <u>NUMBER</u>	<u>EFFECTIVE</u> <u>DATE</u>	<u>AFFECTED</u> <u>PAGE NUMBER</u>	<u>DESCRIPTION OF REVISION OR CHANGE</u>
0	6-10-02	ALL	Initial issue replace PAI-13.01 (PER 01-017150-000). Intent Change.

<p style="text-align: center;">WBN UNIT 0</p>	<p style="text-align: center;">PROCESS CONTROL PROGRAM</p>	<p style="text-align: center;">PCP Revision 0 Page 4 of 11</p>
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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of the Watts Bar Nuclear Plant (WBN) Process Control Program (PCP) is to establish a program which provides reasonable assurance that all radioactive wastes processed at WBN for disposal at a land disposal facility are processed and packaged such that applicable Federal and State regulations and disposal site criteria are satisfied. The PCP contains a general description of the methods for controlling the processing and packaging of radioactive wastes, specific parameters for each method, and the administrative controls and quality assurance required to ensure compliance with applicable regulations and requirements. This PCP is not applicable to wastes transported to an off-site vendor for processing.

1.2 SCOPE

This PCP applies to the processing of wet solid radioactive wastes generated as a result of plant operation and maintenance. This PCP does not apply to the treatment of mixed radioactive and hazardous wastes.

2.0 DETAILS

2.1 WASTE CHARACTERISTICS

A. Waste Streams

1. There are six waste streams that have been identified at WBN. These are primary resins, secondary resins, mobile demineralizer resin, filter elements, oil, and dry active waste (DAW). This PCP is not normally applicable to DAW. Other waste streams may be identified based upon plant operating characteristics.
2. Primary resins are collected in the spent resin storage tank for blending, decay, and storage. Primary resin sources are Chemical and Volume Control System (CVCS) letdown demineralizers, boron recovery demineralizers, and the fuel pool demineralizers.
3. Secondary resins are generated from the condensate polisher demineralizers.
4. Mobile demineralizer resins are fed by several sources including floor drain wastes, equipment drain wastes, laundry and hot shower wastes, and chemical wastes.
5. Filter elements will be accumulated from one or more plant systems. These are CVCS, seal injection, boron recovery, and spent fuel pool clean-up.
6. Oil is contaminated with radioactivity from various areas within the plant, as a result of normal operation and maintenance.
7. The Condensate Demineralizer Waste Evaporator (CDWE) is not part of the Unit 1 license, but may be incorporated into the Unit 2 license application. If the CDWE is to be operated as part of the Unit 2 startup, the PCP shall be revised to incorporate the processing of the CDWE bottoms.
8. DAW is generated within the plant and is not appropriately attributed to the above mentioned waste streams. DAW normally includes paper, plastic, wood, metal, and other such material generated as a result of the operation and maintenance of the plant.

WBN UNIT 0	PROCESS CONTROL PROGRAM	PCP Revision 0 Page 6 of 11
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B. Waste Form

Wastes are processed as appropriate to ensure that the minimum physical characteristics required by 10 CFR 61 and disposal site criteria are met. All class B and C waste must be stabilized. This shall be accomplished by placement into a high integrity container (HIC), or by solidification using a process that produces a product which meets the stability requirements of 10 CFR 61, per section 2.2 of this PCP. The vendors topical report shall include documentation of testing which verifies that the HIC or solidified product meets these stability requirements. Additionally, WBN shall comply with Federal and/or State requirements imposed specifically on an approved HIC or solidification product which limit the type and/or radioactive concentration of the waste to be placed in the HIC or solidified product.

C. Waste Classification

Radioactive waste shall be classified as Class A, B, or C in accordance with the requirements of 10 CFR 61, using one or more of the classification methods given in the USNRC's "Low- Level Waste Licensing Branch Technical Position on Radioactive Waste Classification (May 1983)." Waste classification shall be in accordance with approved station procedures.

The following specific requirements shall be incorporated in the program for sampling and analysis for waste classification:

1. Annual analysis shall be performed on representative samples of each waste stream for the nuclides listed in Table 1 and Table 2 of 10 CFR 61.55. For waste streams that are not processed annually, the annual analysis need not be performed until the waste is processed. Isotopic data from other PWR's may be utilized until annual analysis can be performed.
2. The results of these annual analysis shall be used to develop isotopic abundances and scaling factors for difficult to measure nuclides (i.e., beta emitters and transuranics) based on correlations between those nuclides and more easily measured gamma emitters.
3. Calculational methods for determining the total activity in each container shall be developed which utilizes the results from the annual analysis.
4. The classification program shall establish criteria and include provisions for an increased frequency for sampling and analysis required by paragraph 1 above, if the waste stream isotopic content may have changed by a factor of 10.

2.2 PROCESSING OF WET RADIOACTIVE WASTE

A. Processing Methods

Wet radioactive waste processed at WBN shall be processed into a form acceptable for disposal at a licensed facility. Processing shall be performed utilizing vendor supplied equipment operated in accordance with the vendor's PCP and procedures. Any vendor selected to provide services or products used for compliance with 10 CFR 61 stability requirements shall have a topical report addressing 10 CFR 61 requirements under review or approved by the NRC. The topical reports and PCP's of other vendors may be referenced in this PCP even if all vendors are not actively providing service or products at WBN. However, if any vendor is selected whose documents are not referenced, this document shall be revised to reference them.

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B. System Qualification Tests

1. Prior to the initial solidification of a given waste stream using a specified process, a test shall be conducted to demonstrate the ability of the process to produce an acceptable waste form over the range of critical parameters identified during the prequalification testing. Bounds for critical parameters and specific operating limits shall be specified in the vendor's PCP.
2. These tests shall be performed on laboratory scale or full scale specimens and shall ensure that the acceptance criteria specified in Section 2.2.E are achieved.
3. The dewatering process shall specify an endpoint for each dewatering evolution so as to assure that the acceptance criteria specified in Section 2.2.E are achieved.

C. Batch Processing

Each batch of waste offered for processing shall be sampled and analyzed, as appropriate, in accordance with site procedures, the vendor's PCP and the topical report that addresses the 10 CFR 61 stability requirements. This sampling shall:

1. Provide the necessary data to estimate curie content and to perform the waste classification analysis.
2. When solidification is involved, sampling shall provide data necessary to:
 - a. Ensure that waste stream parameters are within the bounds for critical parameters established in the vendor's PCP and topical report.
 - b. Verify the application of preestablished mix ratios.

D. Testing/Inspections

1. Tests are performed on those wastes which are solidified to ensure the adequacy of the solidification agent and/or procedural technique. The vendor's PCP shall be used to verify the solidification of at least one representative test specimen from at least every tenth batch of each type waste being processed.
2. If any test specimen fails to verify solidification, the solidification of the batch under test shall be suspended until such time as additional test specimens can be obtained, alternative solidification parameters can be determined in accordance with the vendor's PCP, and a subsequent test verifies solidification. Solidification of the batch may then be resumed using the alternative solidification parameters determined by the vendor's PCP.
3. If the initial test specimen from a batch fails to verify solidification, the vendor's PCP shall provide for the collection and testing of representative test specimens from each consecutive batch of waste until at least 3 consecutive test specimens demonstrate solidification.

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E. Acceptance Criteria

1. All classes of waste shall satisfy the following acceptance criteria:
 - a. Liquid wastes shall be solidified.
 - b. Solid waste containing liquids shall not contain freestanding liquid in excess of 1% of the internal volume of the container.
2. For wastes which require structural stability, the acceptance criteria are as follows:
 - a. The waste shall have structural stability.
 - b. Notwithstanding the provisions of Section 2.2.E.1, liquid wastes or wastes containing liquid shall be converted into a form in which the freestanding liquid shall not exceed 1% of the internal volume of the container when contained in a HIC, or 0.5% of the volume of the waste for waste processed to a stable form.

F. Corrective Actions

With processing not meeting the above acceptance criteria or otherwise not meeting disposal site, shipping and/or transportation requirements, suspend shipment of inadequately processed waste and correct the PCP, procedures, and/or waste processing equipment as necessary to prevent recurrence. The disposition of inadequately processed wastes will be handled on a case-by-case basis.

2.3 WASTE STREAM PROCESSING METHODS

A. Spent Resins

1. Normally spent resins are processed for disposal by dewatering. The resin is transferred to the liner or HIC where it is processed utilizing vendor supplied services, per Section 2.2.
2. Alternatively, resins may be processed for disposal by solidification. The resins shall be sampled for isotopic content and PCP parameters as defined in the vendor's PCP. The resins are transferred to the vendor's processing skid where they are solidified per Section 2.2.

B. Spent Filter Elements

Spent filter elements are surveyed for dose rate upon removal from the system. The measured dose rate is used to calculate isotopic content using a dose-to-curie conversion and scaling factors per Section 2.1. Based on the isotopic content and waste classification, the appropriate process and container to be used for disposal are determined. Normally, filters are placed in a liner or HIC and dewatered; however, filters may be dried and handled as DAW if conditions allow, or may be encapsulated.

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C. Miscellaneous Wastes

Sludges and other miscellaneous wastes will be collected and handled on a case-by-case basis, and processed per Section 2.2. Oil and, on a case-by-case basis, other acceptable liquid waste will normally be shipped off-site to a licensed incinerator for disposal.

2.4 ADMINISTRATIVE CONTROLS

A. Procedures

Activities associated with the implementation of the requirements of this program shall be conducted in accordance with approved procedures or vendor documents that have been reviewed and approved by WBN.

B. Quality Assurance/Quality Control

Quality assurance assessments are conducted by the Quality Assurance organization, and by the Corporate Radiological Control organization. Assessment findings are reviewed by WBN management. Quality control measures include site review of all radwaste vendor procedures before use and verification, by site personnel, of end points or acceptance criteria in vendor procedures. Quality control of solidification methods is performed through controlled testing of a minimum of one sample from each batch to be solidified. Proportions of solidification agents are established which meet the standards for waste form and free standing liquid criteria.

C. Training

Personnel involved in processing radioactive waste for shipment are trained in site procedures, regulatory requirements, and disposal site criteria applicable to the individuals responsibilities. The retraining of personnel shall be at the frequency specified in site procedures.

D. Licensee Initiated Changes to the PCP

1. Licensee initiated changes to the PCP shall be documented and records of reviews performed shall be retained for the duration of the unit Operating License. This documentation shall contain:
 - a. Sufficiently detailed information to support the change(s) and appropriate analyses or evaluations justifying the change(s); and
 - b. A determination that the change(s) maintain the overall conformance of the solidified waste product to existing requirements of Federal, State, or other applicable regulations.
 - c. Shall be effective after review and acceptance by the Plant Operations Review Committee (PORC) and the approval of the Plant Manager.
2. Licensee initiated changes to the PCP shall be reported to the Commission in the Annual Radioactive Effluent Release Report for the period in which the revision was reviewed by the PORC, in accordance with the WBN Off-site Dose Calculation Manual (ODCM).

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E. Major Changes To Liquid Gaseous Radwaste Treatment Systems

Licensee initiated major changes to the Radwaste Treatment Systems (liquid and gaseous) shall be reported to the Commission in the Annual Radioactive Effluent Release Report for the period in which the evaluation was reviewed by the PORC, in accordance with the WBN ODCM.

3.0 RECORDS

None

4.0 DEFINITIONS

Batch - An isolated quantity of waste to be processed having constant physical and chemical characteristics.

Dewatered - Wet solid wastes which have had excess water removed.

Free liquid - Uncombined liquid not bound by the solid matrix of the solid waste mass; capable of flowing.

Homogeneous - Of uniform composition; the waste is uniformly distributed throughout the container.

Liquid waste - Any aqueous or non-aqueous radioactive liquid which requires processing before disposal. This may include oils, chemicals, water, or other liquids unsuitable for inplant cleanup or treatment.

Mixed waste - Low level radioactive wastes containing chemical constituents which are hazardous under 40 CFR 261.

Solidification agent - Material which, when mixed in prescribed proportions with liquid or wet solid wastes, can form a free standing product with no free liquid.

Solidification - The conversion of wet wastes into a solid form that meets shipping and burial site criteria.

Stability - A property of the waste form such that it is able to maintain its structural integrity under the expected disposal conditions; stabilized waste should maintain its gross physical properties and identity over a 300 year period.

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5.0 REFERENCES

- 5.1 Code of Federal Regulations (CFR) Title 10, Parts 20, 61, 71; 10 CFR 20, 10 CFR 61, 10 CFR 71.
- 5.2 Code of Federal Regulations (CFR) Title 49.
- 5.3 Watts Bar Nuclear Plant Off-site Dose Calculation Manual
- 5.4 USNRC Low Level Waste Licensing Branch Technical Position on Radioactive Waste Classification, May 1983
- 5.5 USNRC Low Level Waste Licensing Branch Technical Position on Radioactive Waste Form, January 1991
- 5.6 Topical Report CNSI DW-11118-01-P-A for Chem-Nuclear Systems, Inc., Dewatering Control Process Containers
- 5.7 CNSI, FO-OP-023, Bead Resin/Activated Carbon Dewatering Procedure for CNSI 14-215 or Smaller Liners
- 5.8 CNSI, FO-OP-19, Polyethylene High Integrity Container Overpack Handling Procedure
- 5.9 CNSI, FO-AD-002, Operating Guidelines for Use of Polyethylene High Integrity Containers

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Source Notes

None.

Enclosure 3

**Watts Bar Nuclear Plant
Errata Pages for the 1999 Annual Radioactive Effluent Release Report (ARERR)
TVA's Letter Dated April 28, 2000**

1999
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

TABLE 6-A
Doses from Airborne Effluents

First Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	5.50E-03 mrad	5 mrad	< 1%	ESE/1250 meters
Beta Air	3.99E-03 mrad	10 mrad	< 1%	ESE/1250 meters
Submersion				
Total Body	2.40E-03 mrem	N/A	N/A	SE/1372 meters
Skin	3.90E-03 mrem	N/A	N/A	SE/1372 meters
Organ Doses				
Child/Thyroid	3.48E-03 mrem	7.5 mrem	< 1%	SSW/1979 meters
Child/Total Body	3.44E-03 mrem	7.5 mrem	< 1%	SSW/1979 meters

Population Doses

Total Body Dose 8.01E-03 man-rem
Maximum Organ Dose (organ) 8.01E-03 man-rem (thyroid)

Second Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	3.16E-04 mrad	5 mrad	< 1%	E/1280 meters
Beta Air	9.78E-04 mrad	10 mrad	< 1%	E/1280 meters
Submersion				
Total Body	1.74E-04 mrem	N/A	N/A	SE/1372 meters
Skin	4.32E-04 mrem	N/A	N/A	SE/1372 meters
Organ Doses				
Child/Thyroid	8.60E-04 mrem	7.5 mrem	< 1%	SSE/1676 meters
Child/Total Body	8.60E-04 mrem	7.5 mrem	< 1%	SSE/1676 meters

Population Doses

Total Body Dose 5.35E-03 man-rem
Maximum Organ Dose (organ) 5.35E-03 man-rem (thyroid)

Population doses can be compared to the natural background dose for the entire 50-mile population of about 150,000 man-rem/year (based on 140 mrem/yr for natural background).

1999
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

TABLE 6-B
Doses from Airborne Effluents

Third Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	5.10E-03 mrad	5 mrad	< 1%	ESE/1250 meters
Beta Air	2.28E-03 mrad	10 mrad	< 1%	ESE/1250 meters
Submersion				
Total Body	3.38E-03 mrem	N/A	N/A	SE/1372 meters
Skin	5.10E-03 mrem	N/A	N/A	SE/1372 meters
Organ Doses				
Child/Thyroid	4.02E-03 mrem	7.5 mrem	< 1%	SSE/1676 meters
Child/Total Body	4.02E-03 mrem	7.5 mrem	< 1%	SSE/1676 meters

Population Doses

Total Body Dose 1.49E-02 man-rem
Maximum Organ Dose (organ) 1.49E-02 man-rem (thyroid)

Fourth Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	2.19E-03 mrad	5 mrad	< 1%	ESE/1250 meters
Beta Air	8.78E-04 mrad	10 mrad	< 1%	ESE/1250 meters
Submersion				
Total Body	1.29E-03 mrem	N/A	N/A	SE/1372 meters
Skin	1.91E-03 mrem	N/A	N/A	SE/1372 meters
Organ Doses				
Child/Thyroid	4.38E-03 mrem	7.5 mrem	< 1%	SSE/1676 meters
Child/Total Body	4.38E-03 mrem	7.5 mrem	< 1%	SSE/1676 meters

Population Doses

Total Body Dose 1.35E-02 man-rem
Maximum Organ Dose (organ) 1.35E-02 man-rem (thyroid)

Population doses can be compared to the natural background dose for the entire 50-mile population of about 150,000 man-rem/year (based on 140 mrem/yr for natural background).

1999
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

TABLE 8
Total Dose from Fuel Cycle

Dose	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	
Total Body or any Organ(except thyroid)					
Total body air submersion	2.40E-03	1.74E-04	3.38E-03	1.29E-03	
Critical organ dose (air)	3.44E-03	8.60E-04	4.02E-03	4.38E-03	
Total body dose (liquid)	1.7E-03	1.4E-03	2.1E-04	1.6E-04	
Maximum organ dose (liquid)	1.8E-03	1.6E-03	9.1E-04	3.5E-04	
Direct Radiation Dose	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Total	9.34E-03	4.03E-03	8.52E-03	6.18E-03	
Cumulative Total Dose (mrem)					2.81E-02
Annual Dose Limit (mrem)					25
Percent of Limit					< 1 %
Thyroid					
Total body air submersion	2.40E-03	1.74E-04	3.38E-03	1.29E-03	
Thyroid dose (airborne)	3.48E-03	8.60E-04	4.02E-03	4.38E-03	
Total body dose (liquid)	1.7E-03	1.4E-03	2.1E-04	1.6E-04	
Thyroid dose (liquid)	1.7E-03	8.6E-04	2.0E-04	1.5E-04	
Direct Radiation Dose	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Total	9.28E-03	3.29E-03	7.81E-03	5.98E-03	
Cumulative Total Dose (mrem)					2.64E-02
Annual Dose Limit (mrem)					75
Percent of Limit					< 1 %

Enclosure 4

**Watts Bar Nuclear Plant
Errata Pages for the 2001 Annual Radioactive Effluent Release Report (ARERR)
TVA's Letter Dated April 30, 2002**

2001
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

TABLE 6-A
Doses from Airborne Effluents

First Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	7.83E-03 mrad	5 mrad	< 1%	ENE/1370 meters
Beta Air	3.55E-03 mrad	10 mrad	< 1%	ENE/1370 meters
Submersion				
Total Body	3.16E-03 mrem	N/A	N/A	ENE/2414 meters
Skin	4.77E-03 mrem	N/A	N/A	ENE/2414 meters
Organ Doses				
Child/Thyroid	5.00E-03 mrem	7.5 mrem	< 1%	NE/3829 meters
Child/Total Body	4.99E-03 mrem	7.5 mrem	< 1%	NE/3829 meters

Population Doses

Total Body Dose 2.27E-02 man-rem
Maximum Organ Dose (organ) 2.27E-02 man-rem (thyroid)

Second Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	3.36E-02 mrad	5 mrad	< 1%	E/1280 meters
Beta Air	1.21E-02 mrad	10 mrad	< 1%	E/1280 meters
Submersion				
Total Body	1.11E-02 mrem	N/A	N/A	SE/1372 meters
Skin	1.64E-02 mrem	N/A	N/A	SE/1372 meters
Organ Doses				
Child/Thyroid	3.08E-02 mrem	7.5 mrem	< 1%	NE/3829 meters
Child/Total Body	3.08E-02 mrem	7.5 mrem	< 1%	NE/3829 meters

Population Doses

Total Body Dose 1.08E-01 man-rem
Maximum Organ Dose (organ) 1.08E-01 man-rem (thyroid)

Population doses can be compared to the natural background dose for the entire 50-mile population of about 150,000 man-rem/year (based on 140mrem/yr for natural background).

2001
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

TABLE 6-B
Doses from Airborne Effluents

Third Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	1.11E-01 mrad	5 mrad	< 1%	ESE/1250 meters
Beta Air	4.47E-02 mrad	10 mrad	< 1%	ESE/1250 meters
Submersion				
Total Body	8.04E-02 mrem	N/A	N/A	SE/1372 meters
Skin	1.20E-01 mrem	N/A	N/A	SE/1372 meters
Organ Doses				
Child/Thyroid	2.94E-02 mrem	7.5 mrem	< 1%	SSE/2043 meters
Child/Total Body	2.94E-02 mrem	7.5 mrem	< 1%	SSE/2043 meters

Population Doses

Total Body Dose 6.58E-02 man-rem
 Maximum Organ Dose (organ) 6.58E-02 man-rem (thyroid)

Fourth Quarter

Individual Doses

Pathway	Dose	Quarterly Limit	Percent of Limit	Location
External				
Gamma Air	5.85E-02 mrad	5 mrad	< 1%	ENE/1370 meters
Beta Air	2.21E-02 mrad	10 mrad	< 1%	ENE/1370 meters
Submersion				
Total Body	2.31E-02 mrem	N/A	N/A	ENE/2414 meters
Skin	3.42E-02 mrem	N/A	N/A	ENE/2414 meters
Organ Doses				
Child/Thyroid	1.27E-02 mrem	7.5 mrem	< 1%	NE/3829 meters
Child/Total Body	1.27E-02 mrem	7.5 mrem	< 1%	NE/3829 meters

Population Doses

Total Body Dose 4.27E-02 man-rem
 Maximum Organ Dose (organ) 4.27E-02 man-rem (thyroid)

Population doses can be compared to the natural background dose for the entire 50-mile population of about 150,000 man-rem/year (based on 140mrem/yr for natural background).

2001
WATTS BAR NUCLEAR PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

TABLE 8
Total Dose from Fuel Cycle

Dose	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	
Total Body or any Organ(except thyroid)					
Total body air submersion	3.16E-03	1.11E-02	8.04E-02	2.31E-02	
Critical organ dose (air)	4.99E-03	3.08E-02	2.94E-02	1.27E-02	
Total body dose (liquid)	7.2E-04	1.2E-03	2.9E-03	2.8E-03	
Maximum organ dose (liquid)	8.3E-04	1.2E-03	2.9E-03	2.8E-03	
Direct Radiation Dose	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Total	9.70E-03	4.43E-02	1.16E-01	4.14E-02	
Cumulative Total Dose (mrem)					2.11E-01
Annual Dose Limit (mrem)					25
Percent of Limit					0.84 %
Thyroid					
Total body air submersion	3.16E-03	1.11E-02	8.04E-02	2.31E-02	
Thyroid dose (airborne)	5.00E-03	3.08E-02	2.94E-02	1.27E-02	
Total body dose (liquid)	7.2E-04	1.2E-03	2.9E-03	2.8E-03	
Thyroid dose (liquid)	7.0E-04	1.2E-03	2.9E-03	2.8E-03	
Direct Radiation Dose	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Total	9.58E-03	4.43E-02	1.16E-01	4.14E-02	
Cumulative Total Dose (mrem)					2.11E-01
Annual Dose Limit (mrem)					75
Percent of Limit					0.28 %