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METCO

SOURCE EMISSIONS SURVEY
OF
ARKANSAS POWER & LIGHT COMPANY
WHITE BLUFF STEAM ELECTRIC STATION
UNIT NUMBER 2 STACK
REDFIELD, ARKANSAS

DECEMBER 1981

FILE NUMBER 81-101

WB_00006298

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SOURCE EMISSIONS SURVEY
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INTRODUCTION

Mullins Environmental Testing Co., Inc., Dallas, Texas, conducted a source emissions survey of the Arkansas Power & Light Company, White Bluff Steam Electric Station located near Redfield, Arkansas, on December 14, 15, 16 and 17, 1981. The purpose of these tests was to determine the concentrations of particulate matter, sulfur dioxide, and oxides of nitrogen being emitted to the atmosphere via the stack from Unit Number 2.

The sampling followed the procedures set forth in the Appendix to the Code of Federal Regulations, Title 40, Chapter I, Part 60.

SUMMARY OF RESULTS

The principal conclusions are as follows:

Boiler at 863 megawatts

1. The emissions of particulate matter from the stack were equal to 0.040 pounds per million Btu of heat input (17.2 nanograms per Joule), based on averaging the three tests using the "front-half" collections of the EPA-type sampling train and using an F factor of 9820 dscf/million Btu. The allowable emission rate is 0.10 pounds per million Btu of heat input as determined from the Code of Federal Regulations, Title 40, Chapter I, Part 60, Subpart D. The actual emissions were 40.3 percent of the allowable emission rate.

2. The emissions of sulfur dioxide from the stack were equal to 0.92 pounds per million Btu of heat input (395.6 nanograms per Joule), based on averaging the three tests and using an F factor of 9820 dscf/million Btu. The allowable emission rate is 1.2 pounds per million Btu of heat input as determined from the Code of Federal Regulations, Title 40, Chapter I, Part 60, Subpart D. The actual emissions were 76.6 percent of the allowable emission rate.

3. The emissions of oxides of nitrogen from the stack were equal to 0.508 pounds per million Btu of heat input (218.4 nanograms per Joule), based on averaging the twelve flasks and using an F factor of 9820 dscf/million Btu. The allowable emission rate is 0.70 pounds per million Btu of heat input as determined from the Code of Federal Regulations, Title 40, Chapter I, Part 60, Subpart D. The actual emissions were 72.6 percent of the allowable emission rate.

Boiler at 880 megawatts

1. The emissions of particulate matter from the stack were equal to 0.043 pounds per million Btu of heat input (18.5 nanograms per Joule), based on averaging the three tests using the "front-half" collections of the EPA-type sampling train and using an F factor of 9820 dscf/million Btu. The allowable emission rate is 0.10 pounds per million Btu of heat input as determined from the Code of Federal Regulations, Title 40, Chapter I, Part 60, Subpart D. The actual emissions were 42.7 percent of the allowable emission rate.

2. The emissions of sulfur dioxide from the stack were equal to 1.12 pounds per million Btu of heat input (481.6 nanograms per Joule), based on averaging the three tests and using an F factor of 9820 dscf/million Btu. The allowable emission rate is 1.2 pounds per million Btu of heat input as determined from the Code of Federal

Regulations, Title 40, Chapter I, Part 60, Subpart D. The actual emissions were 93.6 percent of the allowable emission rate.

3. The emissions of oxides of nitrogen from the stack were equal to 0.608 pounds per million Btu of heat input (261.4 nanograms per Joule), based on averaging the twelve flasks and using an F factor of 9820 dscf/million Btu. The allowable emission rate is 0.70 pounds per million Btu of heat input as determined from the Code of Federal Regulations, Title 40, Chapter I, Part 60, Subpart D. The actual emissions were 86.8 percent of the allowable emission rate.

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SUMMARY OF RESULTS

White Bluff Steam Electric Station
Unit Number 2 Stack

Run Number	1**	2	3
Stack Flow Rate - ACFM	3,120,597	3,099,474	3,109,571
Stack Flow Rate - DSCFM*	1,796,209	1,817,446	1,813,813
% Water Vapor - % Vol.	12.1	11.4	11.5
% CO_2 - % Vol.	14.0	13.9	13.7
% O_2 - % Vol.	5.1	5.3	5.7
% Excess Air @ Sampling Point	31	33	36
Particulates Probe, Cyclone & Filter Catch grains/dscf*	0.0242	0.0235	0.0167
grains/cf @ Stack Conditions	0.0139	0.0137	0.0097
lbs/hr	372.3	365.7	259.3
Emission Rate calculated using an F factor of 9820 dscf/million Btu - lbs/million Btu	0.045	0.044	0.032
Emission Rate calculated using an F_c factor of 1810 scf CO_2/million Btu - lbs/million Btu	0.045	0.044	0.032
Process Input as calculated from coal analysis - million Btu/hr	------	------	------
Emission Rate calculated using process input - lbs/million Btu	------	------	------
Emission Limit 40 CFR 60 - lbs/million Btu	0.10	0.10	0.10
Boiler Production - megawatts	865	860	865

* 29.92 "Hg, 68°F
** Soot blowing during test.

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SUMMARY OF RESULTS

White Bluff Steam Electric Station
Unit Number 2 Stack

Sulfur Dioxide Emissions Data

Run Number	1	2	3	Average
ppm SO_2	436	422	401	420
Emission Rate calculated using an F factor of 9820 dscf/million Btu - lbs/million Btu	0.940	0.921	0.898	0.920
Emission Rate calculated using an F_c factor of 1810 scf CO_2/million Btu - lbs/million Btu	0.935	0.912	0.879	0.909
Process Input as calculated from coal analysis - million Btu/hr	-----	-----	-----	-----
Emission Rate calculated using process input - lbs/million Btu	-----	-----	-----	-----
Emission Limit 40 CFR 60 - lbs/million Btu	1.2	1.2	1.2	1.2

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SUMMARY OF RESULTS

White Bluff Steam Electric Station
Unit Number 2 Stack

Oxides of Nitrogen Emissions Data

Run Number	1	2	3	Average
ppm NO_x	315	335	318	323
lbs/dscf NO_x	3.76×10^{-5}	4.00×10^{-5}	3.79×10^{-5}	3.85×10^{-5}
Emission Rate calculated using an F factor of 9820 dscf/million Btu - lbs/million Btu	0.488	0.525	0.512	0.508
Emission Rate calculated using an F_c factor of 1810 scf CO_2/million Btu - lbs/million Btu	0.485	0.520	0.501	0.502
Process Input as calculated from coal analysis - million Btu/hr	-----	-----	-----	-----
Emission Rate calculates using process input - lbs/million Btu	-----	-----	-----	-----
Emission Limit 40 CFR 60 - lbs/million Btu	0.70	0.70	0.70	0.70

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SUMMARY OF RESULTS

White Bluff Steam Electric Station
Unit Number 2 Stack

Run Number	4**	5	6
Stack Flow Rate - ACFM	3,035,980	3,035,904	3,033,874
Stack Flow Rate - DSCFM*	1,848,239	1,863,179	1,850,810
% Water Vapor - % Vol.	11.2	10.7	10.8
% CO_2 - % Vol.	13.4	13.3	13.3
% O_2 - % Vol.	6.2	6.1	6.0
% Excess Air @ Sampling Point	41	40	39
Particulates Probe, Cyclone & Filter Catch grains/dscf*	0.0200	0.0206	0.0240
grains/cf @ Stack Conditions	0.0122	0.0126	0.0146
lbs/hr	317.4	329.1	380.8
Emission Rate calculated using an F factor of 9820 dscf/million Btu - lbs/million Btu	0.040	0.041	0.047
Emission Rate calculated using an F_c factor of 1810 scf CO_2/million Btu - lbs/million Btu	0.039	0.040	0.047
Process Input as calculated from coal analysis - million Btu/hr	------	------	------
Emission Rate calculated using Process Input - lbs/million Btu	------	------	------
Emission Limit 40 CFR 60 - lbs/million Btu	0.10	0.10	0.10
Boiler Steam Production-megawatts	878	881	882

* 29.92 "Hg, 68°F
** Soot blowing during test.

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SUMMARY OF RESULTS

White Bluff Steam Electric Station
Unit Number 2 Stack

Sulfur Dioxide Emissions Data

Run Number	4	5	6	Average
ppm SO_2	504	474	484	487
Emission Rate calculated using an F factor of 9820 dscf/million Btu - lbs/million Btu	1.17	1.09	1.11	1.12
Emission Rate calculated using an F_c factor of 1810 scf CO_2/million Btu - lbs/million Btu	1.13	1.07	1.09	1.10
Process Input as calculated from coal analysis - million Btu/hr	----	----	----	----
Emission Rate calculated using process input - lbs/million Btu	----	----	----	----
Emission Limit 40 CFR 60 - lbs/million Btu	1.2	1.2	1.2	1.2

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SUMMARY OF RESULTS

White Bluff Steam Electric Station
Unit Number 2 Stack

Oxides of Nitrogen Emissions Data

Run Number	4	5	6	Average
ppm NO_x	359	383	361	368
lbs/dscf NO_x	4.29×10^{-5}	4.57×10^{-5}	4.30×10^{-5}	4.39×10^{-5}
Emission Rate calculated using an F factor of 9820 dscf/million Btu - lbs/million Btu	0.597	0.633	0.593	0.608
Emission Rate calculated using an F_c factor of 1810 scf CO_2/million Btu - lbs/million Btu	0.578	0.621	0.585	0.595
Process Input as calculated from coal analysis - million Btu/hr	-----	-----	-----	-----
Emission Rate calculated using process input - lbs/million Btu	-----	-----	-----	-----
Emission Limit 40 CFR 60 - lbs/million Btu	0.70	0.70	0.70	0.70