METCO ENVIRONMENTAL
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SOURCE EMISSIONS SURVEY
OF
ENTERGY SERVICES, INC.
WHITE BLUFF STATION
UNIT NUMBER 2
REDFIELD, ARKANSAS

NOVEMBER 2000

FILE NUMBER 00-350

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INTRODUCTION

METCO Environmental, Dallas, Texas, conducted a source emissions survey of Entergy Services, Inc., White Bluff Station, located at 1100 White Bluff Road, Redfield, Arkansas, on November 7, 8, 9, and 10, 2000. The parameters and services sampled are listed on the following page. Three sets of tests were performed while the unit was operating at a load condition of 842 gross megawatts.

The sampling was performed by Mr. Billy Hefley – Program Manager/Utilities, Mr. Steve Bornsen, Mr. James Mode, Mr. Mike Bass, Mr. Bill Tollett, Mr. Jason Conway, Mr. Brian Taylor, Mr. David Olsen, Mr. Scott Hart, Mr. John Pellegrine, and Mr. Mark Glicer.

The sampling followed the procedures set forth in the Code of Federal Regulations, Title 40, Chapter I, Part 60, Appendix A, Methods 1, 2, 3B, 4, and 17.

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Source	Parameters Sampled
Unit Number 2 ESP Inlet A Duct	Particulate Matter
Unit Number 2 ESP Inlet B Duct	Particulate Matter
Unit Number 2 ESP Inlet Nozzle A East	Particulate Matter and Particulate Size Distribution
Unit Number 2 ESP Inlet Nozzle A West	Particulate Matter and Particle Size Distribution
Unit Number 2 ESP Inlet Nozzle C East	Particle Size Distribution
Unit Number 2 ESP Inlet Nozzle C West	Particle Size Distribution
Unit Number 2 ESP Outlet A Duct	Particulate Matter
Unit Number 2 ESP Outlet B Duct	Particulate Matter
Unit Number 2 Stack	Particulate Matter

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SUMMARY OF RESULTS

Unit Number 2 ESP

Inlet A Duct

Run Number	Particulate Matter Emissions (gr/dscf*)	(lbs/hr)	(lbs/million Btu)
1	2.1991	19,225.13	4.039
2	1.3009	11,400.58	2.389
3	1.7642	15,211.71	3.240
Average	1.7547	15,279.14	3.223

Inlet B Duct

Run Number	Particulate Matter Emissions (gr/dscf*)	(lbs/hr)	(lbs/million Btu)
1	1.9278	16,425.10	3.934
2	1.4053	11,922.16	2.868
3	1.8723	16,165.40	3.821
Average	1.7351	14,837.55	3.541

Unit Number 2 Stack

Run Number	Particulate Matter Concentrations (gr/dscf*)	(lbs/hr)	(lbs/million Btu)
1	0.0047	82.50	0.009
2	0.0038	65.98	0.007
3	0.0046	80.17	0.009
Average	0.0044	76.22	0.008

Unit Number 2 ESP Removal Efficiency

Run Number	Inlet Ducts Particulate Matter Emissions (lbs/hr)	Stack Particulate Matter Emissions (lbs/hr)	ESP Removal Efficiency (%)
1	35,650.23	82.50	99.8
2	23,322.74	65.98	99.7
3	31,377.11	80.17	99.7
Average	30,116.69	76.22	99.7

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

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SUMMARY OF RESULTS

Unit Number 2 ESP

Nozzle A East

Run Number	Particulate Matter Concentrations (gr/dscf*)	(lbs/hr)	(lbs/million Btu)
1	1.2015	2,638.46	2.088
2	3.0217	6,442.01	5.359
3	1.0236	2,299.01	1.778
Average	1.7489	3,793.16	3.075

Nozzle A West

Run Number	Particulate Matter Concentrations (gr/dscf*)	(lbs/hr)	(lbs/million Btu)
1	0.7379	1,880.36	1.375
2	2.5221	6,487.40	4.700
3	0.9021	2,283.86	1.706
Average	1.3874	3,550.54	2.594

Outlet A Duct

Run Number	Particulate Matter Concentrations (gr/dscf*)	(lbs/hr)	(lbs/million Btu)
1	0.0024	19.59	0.005
2	0.0027	22.39	0.006
3	0.0020	16.29	0.004
Average	0.0024	19.42	0.005

Outlet B Duct

Run Number	Particulate Matter Concentrations (gr/dscf*)	(lbs/hr)	(lbs/million Btu)
1	0.0039	34.75	0.007
2	0.0030	27.03	0.005
3	0.0046	41.96	0.008
Average	0.0038	34.58	0.007

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

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SUMMARY OF RESULTS

Unit Number 2 ESP Inlet Nozzle A East

Run Number	Median Particle Size (Microns)	Particle Less than 2 Microns Diameter (%)	Particles Less than 10 Microns Diameter (%)
1	4.00	28.5	87.0
2	3.05	36.5	94.5
3	2.90	41.0	96.5
Average	3.32	35.3	92.7

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SUMMARY OF RESULTS

Unit Number 2 ESP Inlet Nozzle A West

Run Number	Median Particle Size (Microns)	Particle Less than 2 Microns Diameter (%)	Particles Less than 10 Microns Diameter (%)
1	4.00	24.5	92.0
2	3.40	29.5	95.0
3	2.65	43.0	90.0
Average	3.35	32.3	92.3

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SUMMARY OF RESULTS

Unit Number 2 ESP Inlet Nozzle C East

Run Number	Median Particle Size (Microns)	Particle Less than 2 Microns Diameter (%)	Particles Less than 10 Microns Diameter (%)
1	4.70	20.8	83.0
3	3.70	29.0	82.0
4	3.70	28.5	93.8
Average	4.03	26.1	86.3

Note: Run Number 2 was invalid due to improper loading of the filters.

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SUMMARY OF RESULTS

Unit Number 2 ESP Inlet Nozzle C West

Run Number	Median Particle Size (Microns)	Particle Less than 2 Microns Diameter (%)	Particles Less than 10 Microns Diameter (%)
1	4.00	24.3	88.0
2	3.15	35.5	82.0
3	2.78	40.0	90.0
Average	3.31	33.3	86.7

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SUMMARY OF RESULTS

Unit Number 2 ESP Inlet A Duct

Run Number	1	2	3
Date	11/08/00	11/08/00	11/08/00
Time	0805-0944	1055-1234	1402-1549
Duct Flow Rate - ACFM	1,768,251	1,763,891	1,787,724
Duct Flow Rate - DSCFM*	1,020,099	1,022,554	1,006,145
% Water Vapor - % Vol.	12.77	12.80	13.17
% CO_2 - % Vol.	14.0	14.0	14.0
% O_2 - % Vol.	5.2	5.2	5.2
% Excess Air @ Sampling Point	32.1	32.1	32.1
Duct Temperature -°F	299	295	309
Duct Pressure - "Hg	28.34	28.34	28.14
Percent Isokinetic	97.8	100.1	101.5
Particulates Nozzle, Thimble & Filter Catch grains/dscf*	2.1991	1.3009	1.7642
grains/cf @ Duct Conditions	1.2642	0.7516	0.9893
lbs/hr	19,225.13	11,400.58	15,211.71

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

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SUMMARY OF RESULTS

Unit Number 2 ESP Inlet B Duct

Run Number	1	2	3
Date	11/08/00	11/08/00	11/08/00
Time	0800-0944	1055-1234	1402-1526
Duct Flow Rate - ACFM	1,754,508	1,773,885	1,840,997
Duct Flow Rate - DSCFM*	994,194	989,904	1,007,471
% Water Vapor - % Vol.	11.36	12.53	12.36
% CO_2 - % Vol.	12.6	12.6	12.6
% O_2 - % Vol.	7.4**	7.4**	7.4**
% Excess Air @ Sampling Point	53.6	53.6	53.6
Duct Temperature -°F	326	326	338
Duct Pressure - "Hg	28.37	28.31	28.13
Percent Isokinetic	99.5	101.1	101.1
Particulates Nozzle, Thimble & Filter Catch grains/dscf*	1.9278	1.4053	1.8723
Grains/cf @ Duct Conditions	1.0886	0.7815	1.0209
lbs/hr	16,425.10	11,922.16	16,165.40

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

** This data is inconsistent with all other test data for oxygen.

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SUMMARY OF RESULTS

Unit Number 2 ESP Inlet Nozzle A East

Run Number	1	2	3
Date	11/09/00	11/09/00	11/09/00
Time	0845-1023	1210-1340	1505-1635
Duct Flow Rate - ACFM	446,034	434,671	455,878
Duct Flow Rate - DSCFM*	256,230	248,767	262,085
% Water Vapor - % Vol.	12.14	12.60	11.79
% CO_2 - % Vol.	14.8	14.5	14.8
% O_2 - % Vol.	4.6	4.6	4.2
% Excess Air @ Sampling Point	27.4	27.3	24.3
Duct Temperature -°F	302	303	308
Duct Pressure - "Hg	28.13	28.21	28.26
Percent Isokinetic	94.7	97.5	96.6
Particulates Nozzle, Thimble & Filter Catch grains/dscf*	1.2015	3.0217	1.0236
grains/cf @ Duct Conditions	0.6878	1.7234	0.5864
lbs/hr	2,638.46	6,442.01	2,299.01

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

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SUMMARY OF RESULTS

Unit Number 2 ESP Inlet Nozzle A West

Run Number	1	2	3
Date	11/09/00	11/09/00	11/09/00
Time	0845-1043	1210-1340	1505-1635
Duct Flow Rate - ACFM	493,781	496,428	489,314
Duct Flow Rate - DSCFM*	297,337	300,140	295,405
% Water Vapor - % Vol.	11.59	12.27	11.68
% CO_2 - % Vol.	13.8	13.8	13.6
% O_2 - % Vol.	5.6	5.8	5.6
% Excess Air @ Sampling Point	35.5	37.4	35.4
Duct Temperature -°F	271	266	272
Duct Pressure - "Hg	28.11	28.25	28.25
Percent Isokinetic	96.3	95.9	97.8
Particulates Nozzle, Thimble & Filter Catch grains/dscf*	0.7379	2.5221	0.9021
grains/cf @ Duct Conditions	0.4428	1.5196	0.5427
lbs/hr	1,880.36	6,487.40	2,283.86

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

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SUMMARY OF RESULTS

Unit Number 2 ESP Outlet A Duct

Run Number	1	2	3
Date	11/09/00	11/09/00	11/09/00
Time	0845-1045	1210-1410	1455-1655
Duct Flow Rate - ACFM	1,643,013	1,642,623	1,626,881
Duct Flow Rate - DSCFM*	946,780	957,828	946,840
% Water Vapor - % Vol.	12.27	11.95	11.82
% CO_2 - % Vol.	12.4	12.6	13.8
% O_2 - % Vol.	7.2	7.2	5.8
% Excess Air @ Sampling Point	51.0	51.2	37.4
Duct Temperature -°F	291	287	290
Duct Pressure - "Hg	27.85	27.93	27.95
Percent Isokinetic	102.1	101.5	98.7
Particulates Nozzle & Filter Catch grains/dscf*	0.0024	0.0027	0.0020
grains/cf @ Duct Conditions	0.014	0.0016	0.0012
lbs/hr	19.59	22.39	16.27

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

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SUMMARY OF RESULTS

Unit Number 2 ESP Outlet B Duct

Run Number	1	2	3
Date	11/09/00	11/09/00	11/09/00
Time	0845-1045	1210-1410	1458-1658
Duct Flow Rate - ACFM	1,851,882	1,843,863	1,920,647
Duct Flow Rate - DSCFM*	1,045,320	1,036,903	1,075,346
% Water Vapor - % Vol.	11.51	11.67	11.54
% CO_2 - % Vol.	14.8	14.2	14.0
% O_2 - % Vol.	4.2	5.6	5.8
% Excess Air @ Sampling Point	24.3	35.8	37.5
Duct Temperature -°F	311	314	321
Duct Pressure - "Hg	27.77	27.82	27.91
Percent Isokinetic	107.6	100.8	100.6
Particulates Nozzle & Filter Catch grains/dscf*	0.0039	0.0030	0.0046
grains/cf @ Duct Conditions	0.0022	0.0017	0.0025
lbs/hr	34.75	27.03	41.96

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

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SUMMARY OF RESULTS

Unit Number 2 Stack

Run Number	1	2	3
Date	11/08/00	11/08/00	11/08/00
Time	0801-1009	1055-1307	1337-1552
Stack Flow Rate - ACFM	3,447,990	3,431,844	3,478,316
Stack Flow Rate - DSCFM*	2,044,025	2,032,963	2,029,423
% Water Vapor - % Vol.	11.05	11.14	11.31
% CO_2 - % Vol.	13.6	13.6	13.4
% O_2 - % Vol.	5.8	5.8	5.8
% Excess Air @ Sampling Point	37.3	37.3	37.2
Stack Temperature -°F	308	307	313
Stack Pressure - "Hg	28.90	28.87	28.71
Percent Isokinetic	99.9	99.5	100.1
Particulates Nozzle & Filter Catch grains/dscf*	0.0047	0.0038	0.0046
grains/cf @ Stack Conditions	0.0028	0.0022	0.0027
lbs/hr	82.50	65.98	80.17

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

WB_00006340

SUMMARY OF RESULTS

Plant Operational Data

Run Number	1	2
Date	11/08/00	11/09/00
Time	0800-1552	0845-1813
Coal Burned – tons	4,240.35	4,940.2
Air Heater Average Gas Inlet -°F	843.5	833.6
Air Heater Average Gas Outlet -°F	308.6	301.2
Average O_2 Readings - % O_2	1.80	1.72
Average Load – Megawatts gross	842	842
Average Ambient Temperature –°F	52	44

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

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