

01/8/00

Page 1 of 1

30.909A

INTEGRATED DRY NO_x/SO₂ EMISSIONS CONTROL SYSTEM

ENVIRONMENTAL MONITORING REPORT

**(Baseline and Baseline Urea Injection Test Periods)
(November 11, 1991 through December 15, 1991)
(February 3, 1992 through March 6, 1992)**

DOE Contract Number DE-FC22-91PC90550

Prepared by

**Terry Hunt
Public Service Company of Colorado
Denver, CO**

July 17, 1992

Revision 1 September 11, 1992

TABLE OF CONTENTS

I.	Project Status	1
	A. Test Summary	1
	B. Summary of Environmental Monitoring	1
II.	Summary of Compliance Monitoring Results	3
	A. Sulfur Dioxide Monitoring	3
	B. Opacity Monitoring	3
	C. Aqueous Stream Monitoring	3
III.	Summary of Supplemental Monitoring Results	4
	A. Gaseous Species Monitoring	4
	B. Particulate Monitoring	5
	C. Aqueous Stream Monitoring	5
	D. Solids Stream Monitoring	6
	Appendix A (State Emission Report)	
	Appendix B (Aqueous Stream Compliance Data)	
	Appendix C (Burner Baseline Data Summary)	
	Appendix D (Urea Injection Baseline Data Summary)	
	Appendix E (Particulate Data Analysis)	
	Appendix F (Coal/Ash Analysis)	

I. Project Status

A. Test Summary

A baseline test was conducted from November 11, 1991 through December 15, 1991 at the Arapahoe 4 steam electric generating station. The purpose of this test was to document the emissions of the generating station with the original burners and auxiliary equipment which represents the unmodified boiler emissions. Testing showed that NO_x emissions were high, in the range of 740 to 850 ppm (corrected to 3% O₂, dry). Excess air level was the primary factor influencing the NO_x emissions and other operating variables did not significantly affect NO_x emissions. Baseline SO₂ is in the range of 350 to 600 ppm (corrected to 3% O₂, dry).

A baseline urea injection test was conducted from February 3, 1992 through March 6, 1992. The purpose of this test was to obtain (1) NO_x reduction, (2) ammonia slip emissions, and (3) nitrous oxide (N₂O) generation of the urea injection system under the baseline conditions before any other boiler modifications had been completed. The urea system worked well at full loads and could remove approximately 30% of the NO_x with an associated ammonia slip of 5 ppm or less. Not all of the NO_x removal is conversion to nitrogen and water. Approximately 10 to 15% of the NO_x reduction is a conversion of NO_x to N₂O. Much higher NO_x removal could be obtained, however ammonia slip would significantly increase.

A short test was also run during this period using aqueous ammonia as the injected reagent. Aqueous ammonia reacted faster and thus allowed lower ammonia slips at the same operating conditions. At full load aqueous ammonia allowed NO_x removal of approximately 35% with ammonia slip of 5 ppm. An advantage of the aqueous ammonia is that only 2 to 3% of the NO_x removal is conversion to N₂O.

B. Summary of Environmental Monitoring

The purpose of this report is to document the environmental monitoring that was completed as part of the two baseline tests completed. Monitoring was completed according the Environmental Monitor Plan for the Integrated Dry NO_x/SO₂ Emissions Control system dated February 1992.

In general the testing went well and there were no environmental events of great importance in defining the baseline emissions. There were no excursions of any compliance monitoring except for opacity. Overall opacity was 99.9% in compliance over both quarters and there were only 47 excursions over the 6 month reporting period. The excursions were likely due

to monitor problems and possibly startup conditions. Average opacity was in the range of 2 to 4%.

A significant amount of supplemental monitoring was completed to define the baseline emissions. The major finding during this testing was that of the NO_x removed through urea injection, approximately 10 to 15% of the NO_x removal is actually a conversion to N_2O . The major difficulty of the period was in obtaining an accurate method of measuring NH_3 emissions. Two techniques were used but it is believed that wet chemical analysis provides the most accurate results. A different continuous emission NH_3 monitor will be used during the remainder of the testing and it is believed that this new monitor will provide measurements closer to the wet chemical analysis.

Particulate emissions were very low on the order of .0007 grains/Dry Standard Cubic Ft. These low emissions are due to the very high removal efficiency of the installed fabric filter. PM_{10} emissions are slightly higher at .0043 grains/Dry Standard Cubic Ft. The increase is due to the capture of condensable particulate emissions such as sulfur dioxide.

II. Summary of Compliance Monitoring Results

A. Sulfur Dioxide Monitoring

Arapahoe 4 has a regulatory limit of a maximum emission of sulfur dioxide of 1.2 lb/MMBtu as defined by Regulation 1, VI.A.3.a.(ii) of the State of Colorado. Arapahoe 4 did not have continuous monitors installed for the test periods covered by this report. Sulfur dioxide emissions were calculated from the amount of sulfur in the fuel and any exceedance above the regulatory limit of 1.2 #/MMBtu are provided to the state on a quarterly basis. The two quarters covered during the test period were the fourth quarter of 1991 and the first quarter of 1992. During the fourth quarter 1991 average SO₂ content of the coal was 0.862 lb/MMBtu. There were no exceedances during the quarter. During the first quarter of 1992 average SO₂ content was 0.872 #/MMBtu. There were also no exceedances during this quarter. See Appendix A for copies of the reports documenting this information to the Colorado Department of Health.

B. Opacity Monitoring

Arapahoe 4 has a regulatory limit to not exceed 20% opacity due to any air pollutant as defined by Regulation 1, II.A.1. The unit uses a Lear Siegler RM41 continuous opacity monitor to measure and record opacity. There were 47 opacity excursions above the 20% limit. See Appendix A for copies of the reports documenting this information to the Colorado Department of Health. The unit was in compliance 99.9% of the period and the average opacity over the period was in the range of 2 to 4%.

C. Aqueous Stream Monitoring

As required by Colorado Wastewater Discharge Permit No. CO-0001091, Arapahoe 4 must sample and report on various aqueous discharges. Reports provided to the regulatory agency for the November & December 1991 and February & March 1992 sample period are contained in Appendix B. Note that the unit was in compliance 100.0% of the period as there were no violations during any of the test periods.

III. Summary of Supplemental Monitoring Results

A. Gaseous Species Monitoring

Significant gas monitoring will be completed in order to determine the positive environmental affects of the Integrated SO₂/NO_x Emissions Control System. Certain gaseous emissions such as nitrous oxide (N₂O), ammonia (NH₃) are important and are potentially a negative effect of the system.

Appendix C contains a summary of all test data obtained during the baseline testing conducted in November and December 1991. During the baseline emissions testing, no additional chemical injection was completed. These gases were not measured during the baseline but were measured during the baseline urea testing as discussed below. Four batch measurements were obtained for sulfur trioxide (SO₃) at the economizer exit during this test period. This data is shown below and the test number corresponds to the test numbers of the data shown in appendix C.

<u>Test</u>	<u>SO₃ (ppm)</u>
10	0.1
35	0.1
37	0.5
38	0.7

Appendix D contains a summary of all test data obtained during the baseline urea testing conducted February and March 1992. During this phase of testing samples were obtained for N₂O and also NH₃. It should be noted that the N₂O measurements were very repeatable and it is believed they are an accurate representation of the test. However, note that two different techniques were used to measure NH₃ emissions, NDIR using gas filter correlation and also wet chemical. Note that the majority of the test data obtained for tests 58 through 100 show that the wet chemical method indicates much greater ammonia emissions than the NDIR continuous method. During this period a non-heated probe was used to collect the sample for the continuous NDIR analyzer. After discovering the differences between the two methods, a heated probe was added to the continuous NDIR system. There is much better agreement between the two test methods after this modification for the data for tests 107 through the end of the testing. It is still believed that the wet chemical method provides the most accurate results.

B. Particulate Monitoring

During the baseline testing at Arapahoe EPA Method 17 was used to obtain both inlet and outlet particulate mass loadings at the fabric filter dust collector. The average inlet loading was 2.1 grains/dry standard cubic foot (gr/DSCF) and the average outlet loading was 0.0007 gr/DSCF. This relates to a collection efficiency of over 99.96%. It should be noted that the outlet grain loading was significantly lower than expected. In previous testing using EPA method 5, loads in the range of 0.0035 gr/DSCF have been measured. There is no difference between the two test methods used that would explain the difference in emissions. Both values are well below the emissions limit of the unit, however an additional test is planned later in the program to verify the outlet grain loading.

A University of Washington Pilot Mark V cascade impactor with a pre-cutter was used to size the inlet sample and determine the particulate size. The mass mean diameter of the inlet was 12 microns which agrees well with previous testing. The complete distribution including a graphical presentation of the data is contained in Appendix E.

The minimum size particle that can be captured with the cascade impactor is 9.3 microns. In order to determine the amount of smaller particulate emissions, EPA method 201A was used to determine the PM₁₀ emission at the fabric filter dust collector outlet. The PM₁₀ emissions show a concentration of 0.0043 gr/DSCF. Note that this value is much greater than the emissions obtained from the impactor sampler. The increase is due to the fact that PM₁₀ sampling includes condensable particulate emissions such as sulfates that can be captured in the ice and water bath used with the impingers to collect the PM₁₀ sample.

During the baseline urea testing conducted in February and March 1992, no additional particulate sampling was completed.

C. Aqueous Stream Monitoring

No supplemental monitoring of any aqueous streams was planned or conducted during the baseline or baseline urea test program. However, during the urea injection testing the consumptive water use of the system was recorded for informational purposes. Water use by month is shown below:

<u>Month</u>	<u>Water Use</u>	
	<u>(gallons)</u>	<u>(acre-ft)</u>
January 1992	23,400	0.072
February 1992	114,800	0.352
March 1992	42,300	0.130
TOTAL	180,500	0.554

Note that these water uses are significantly below those originally estimated. During the original testing it was discovered that the original system design used significantly more water than necessary. The system was modified and water use was cut by nearly 80% from the original design.

D. Solid Stream Monitoring

Raw coal samples were taken on each test day during the baseline testing. Selected samples were submitted for proximate, ultimate and elemental ash analysis by an independent laboratory. Results from these analyses are contained in appendix F. In general, the individual coal samples were consistent although some variance in SO₂ occurred. Two different coal sources were used for the testing. The two coals are very similar in all respects except for SO₂. Average higher heating value of the coal was 11,097 Btu/lb and the average carbon was 62.00%.

The other solid sample analysis completed during the baseline testing consisted of carbon analysis of both fly ash and bottom ash. Data for this testing is contained in Appendix C. Baseline carbon levels in the fly ash are in the range of 4 to 5% carbon although at low excess air conditions it could raise to the 10% level. Bottom ash carbon is always less than the fly ash samples and is generally less than 1%

No solid sampling was taken during the urea baseline testing as there should be no effect on these values due to the urea injection.

INTEGRATED DRY NO_x/SO₂ EMISSIONS CONTROL SYSTEM

ENVIRONMENTAL MONITORING REPORT

**(Baseline and Baseline Urea Injection Test Periods)
(November 11, 1991 through December 15, 1991)
(February 3, 1992 through March 6, 1992)**

Appendix A

State Emission Report



Public Service
Company of Colorado

Anaconda Tower
555 17th Street, Suite 1200
Denver, CO 80202-3912

January 24, 1992

Mr. Roy Doyle
Air Pollution Control Division
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

RE: Fourth Quarter, 1991 Emissions Report, Arapahoe Units #1-4

Dear Roy:

Attached is the emissions report for the fourth quarter, 1991, for the Public Service Company of Colorado Arapahoe Steam Electric Generating Station.

The results of the coal sampling and analysis for this quarter indicated an average SO₂ content of 0.862 lbs SO₂/MMBTU. No exceedance of the SO₂ emission standard occurred at the Arapahoe Station during this quarter.

Dates not reported on the attached emissions report are those in which the units were not running. The operating hours for these units this quarter are: Unit #1 - 682.7 hours, Unit #2 - 1,498.8 hours, Unit #3 - 1,462.7 hours and Unit #4 - 1,889.0 hours.

Feel free to contact me at 294-2810 with any questions in this regard.

Sincerely,

Peter J. Cohlma
Supervisor, Environmental Programs

PJC:tc

Attachments

QUARTERLY EXCESS EMISSIONS REPORT (QER)

**Fossil Fuel-Fired Steam Generators, Subpart D
Suggested Format for Sources in Region VIII*
Minimum Requirements Under Section 60.7 (see instructions)**

Part 1 - This report includes all the required information under section 60.7 for

- a. Quarterly emission reporting period ending:
March 31 June 30 September 30 (December 31)
- b. Reporting year: 1991
- c. Reporting date: 1/13/92
- d. Person completing report: Mark Spomer
- e. Station name: Arapahoe Station
- f. Plant location: 2601 South Platte River Drive
- g. Person responsible for review and integrity of report: Peter J. Cohlma
- h. Mailing address for person in 1-g above:
P.O. Box 840, Denver, CO 80201
- i. Phone number for 1-g above: 294-2810

Part 2 - Instrument information, complete for each instrument.

a. Opacity Monitor:	Unit 1	Unit 2	Unit 3	Unit 4
b. Manufacture:	Lear Siegler	L.S.	L.S.	L.S.
c. Model No:	RM41	RM41	RM41	RM41
d. Serial No:	568	1409	1369	997
e. Installation:	1/77	6/79	6/79	7/79

Part 3 - Excess emissions (by pollutant)

Use Table I: Attach separate narrative per instructions.

Part 4 - Conversion factors

a. Zero and Cal values used, by instruments:

	Unit 1	Unit 2	Unit 3	Unit 4
Zero	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Cal	<u>53.5</u>	<u>51.6</u>	<u>58.4</u>	<u>48.6</u>

Part 5 - Continuous Monitoring System operation failures

See Table II: Complete one sheet for each monitor
attach separate narrative per instructions.

Part 6 - Certification of report integrity, by per in 1-g above:

THIS IS TO CERTIFY THAT TO THE BEST OF MY KNOWLEDGE, THE
INFORMATION PROVIDED IN THE ABOVE REPORT IS COMPLETE AND ACCURATE.

NAME Roder J. Cochran

SIGNATURE Roder J. Cochran

Title Supr. Environmental Program

Date 1/27/92

• Suggested Format for Subpart D sources in:

Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming

TABLE I

Excess Emissions

<u>Date</u>	<u>Time* From - To</u>	<u>Pollutant</u>	<u>Magnitude* Ld/105 BTU</u>
-------------	------------------------	------------------	------------------------------

SO²

No violations

Attached is additional information for excesses occurring during the Third Quarter

* As defined in the instructions form the applicable section of the Federal Register; attached narrative of causes, etc.

TABLE II

Continuous Monitoring System Operation Failures

<u>Date</u>	<u>Time* From - To</u>	<u>Instrument</u>	<u>Effect on Instrument Output</u>
12-13-91	0600 to 0650	Unit 3	Repair shutter

PUBLIC SERVICE COMPANY OF COLORADO

ARAPAHOE UNIT #4

STACK EXCESS EMISSIONS REPORT

4th QTR 1991 YR

UNIT OPERATING HOURS 1,889.0

PAGE 2 OF 2

DATE	PERCENT AVG OP	TOTAL NUMBER EXCESS	DATE	PERCENT AVG OP	TOTAL NUMBER EXCESS	DATE	PERCENT AVG OP	TOTAL NUMBER EXCESS
12/18	2.3	0						
12/19	2.2	0						
12/20	2.3	0						
12/21	2.1	0						
12/22	2.1	0						
12/23	2.4	0						
12/24	2.3	0						
12/25	2.3	0						
12/26	2.5	0						
12/27	2.5	0						
12/28	2.3	0						
12/29	2.1	0						
12/30	2.4	0						
12/31	8.6	14						



Public Service
Company of Colorado
P.O. Box 840
Denver, CO 80201-0840

April 28, 1992

Mr. Roy Doyle
Air Pollution Control Division
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

RE: First Quarter, 1992 Excess Emissions Report, Arapahoe Units #1-4

Dear Roy:

Attached is the excess emissions report for the first quarter, 1992, for the Public Service Company of Colorado Arapahoe Station, Units #1-4.

The results of the coal sampling and analysis for this quarter indicated an average SO₂ content of 0.872 lbs SO₂/MMBTU.

Dates not reported on the attached emissions report are those in which the units were not running. The operating hours for these units this quarter are: Unit #1 - 1,259.4 hours, Unit #2 - 1,297.9 hours, Unit #3 - 1,060.2 hours and Unit #4 - 1,917.8 hours.

Feel free to contact me at 294-2810 with any questions in this regard.

Sincerely,

Peter J. Cohlma
Unit Manager, Environmental Programs

PJC:tc

Attachments

QUARTERLY EXCESS EMISSIONS REPORT (EER)

**Fossil Fuel-Fired Steam Generators, Subpart D
Suggested Format for Sources in Region VIII*
Minimum Requirements Under Section 60.7 (see instructions)**

Part 1 - This report includes all the required information under section 60.7 for

- a. Quarterly emission reporting period ending:
(March 31) June 30 September 30 December 31
- b. Reporting year: 1992
- c. Reporting date: 4/13/92
- d. Person completing report: Mark Spomer
- e. Station name: Arapahoe Station
- f. Plant location: 2601 South Platte River Drive
- g. Person responsible for review and integrity of report: Peter J. Cohlma
- h. Mailing address for person in 1-g above:
P. O. Box 840, Denver, Colorado 80201
- i. Phone number for 1-g above: 294-2810

Part 2 - Instrument information, complete for each instrument.

a. Opacity Monitor:	Unit 1	Unit 2	Unit 3	Unit 4
b. Manufacture:	Lear Siegler	L.S.	L.S.	L.S.
c. Model No:	RM41	RM41	RM41	RM41
d. Serial No:	568	1409	1369	997
e. Installation:	1/77	6/79	6/79	7/79

Part 3 - Excess emissions (by pollutant)

Use Table I: Attach separate narrative per instructions.

Part 4 - Conversion factors

a. Zero and Cal values used, by instruments:

	Unit 1	Unit 2	Unit 3	Unit 4
Zero	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Cal	<u>53.7</u>	<u>51.7</u>	<u>58.4</u>	<u>49.9</u>

Part 5 - Continuous Monitoring System operation failures

See Table II: Complete one sheet for each monitor
attach separate narrative per instructions.

Part 6 - Certification of report integrity, by per in 1-g above:

THIS IS TO CERTIFY THAT TO THE BEST OF MY KNOWLEDGE, THE
INFORMATION PROVIDED IN THE ABOVE REPORT IS COMPLETE AND ACCURATE.

NAME Peter J. Cohlma

SIGNATURE Peter J. Cohlma

Title Unit Manager, Environmental Programs

Date 4/29/92

* Suggested Format for Subpart D sources in:

Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming

TABLE I

Excess Emissions

Date	Time* From - To	Pollutant	Magnitude* Ld/106 BTU
------	-----------------	-----------	-----------------------

SO²

No violations

Opacity

Attached is additional information for excesses occurring during the First Quarter

- As defined in the instructions form the applicable section of the Federal Register; attached narrative of causes, etc.

TABLE II

Continuous Monitoring System Operation Failures

<u>Date</u>	<u>Time* From - To</u>	<u>Instrument</u>	<u>Effect on Instrument Output</u>
3/20/92 thru 3/26/92	1400 to 0830	IBM PS/2	Loss of power - no data (Used backup circular charts)
3/20/92	0915 to 1015	Unit #3 L.S. - RM41	Loss of power - no data

PUBLIC SERVICE COMPANY OF COLORADO

ARAPAHOE UNIT #4

STACK EXCESS EMISSIONS REPORT

1st QTR 1992 YR

UNIT OPERATING HOURS 1917.8

PAGE 1 OF 2

DATE	PERCENT AVG OP	TOTAL NUMBER EXCESS	DATE	PERCENT AVG OP	TOTAL NUMBER EXCESS	DATE	PERCENT AVG OP	TOTAL NUMBER EXCESS
1/1/82	4.3	5	1/25	2.2	0	2/18	4.4	0
1/2	2.3	0	1/26	2.1	0	2/19	4.1	0
1/3	2.2	0	1/27	2.3	0	2/20	3.9	0
1/4	2.2	0	1/28	1.5	0	2/21	4.0	0
1/5	2.0	0	1/29	2.8	0	2/22	4.5	0
1/6	2.0	0	1/30	4.5	0	2/23	4.5	0
1/7	2.2	0	1/31	4.1	0	2/24	4.2	0
1/8	2.6	0	2/1	4.2	0	2/25	4.1	0
1/8	2.6	0	2/2	4.2	0	2/26	4.2	0
1/10	2.1	0	2/3	2.2	0	2/27	3.9	0
1/11	2.0	0	2/4	4.5	0	2/28	4.2	0
1/12	2.4	0	2/5	4.3	0	2/29	4.2	0
1/13	2.6	0	2/6	4.1	0	3/1	4.2	0
1/14	2.6	0	2/7	4.2	0	3/2	4.2	0
1/15	2.6	0	2/8	4.3	0	3/3	4.2	0
1/16	2.2	0	2/9	4.2	0	3/4	4.2	0
1/17	1.8	0	2/10	4.2	0	3/5	4.2	0
1/18	1.2	0	2/11	3.9	0	3/6	4.1	0
1/19	2.2	0	2/12	3.9	0	3/7	4.1	0
1/20	2.1	0	2/13	4.0	0	3/8	4.3	0
1/21	2.2	0	2/14	4.4	0	3/9	4.7	0
1/22	2.1	0	2/15	4.3	0	3/10	4.5	0
1/23	2.1	0	2/16	4.4	0	3/11	4.3	0
1/24	2.0	0	2/17	4.3	0	3/12	4.3	0

PUBLIC SERVICE COMPANY OF COLORADO

ARAPAHOE UNIT #4

STACK EXCESS EMISSIONS REPORT

1st QTR 1992 YR

UNIT OPERATING HOURS 1917.8

PAGE 2 OF 2

DATE	PERCENT AVG OP	TOTAL NUMBER EXCESS	DATE	PERCENT AVG OP	TOTAL NUMBER EXCESS	DATE	PERCENT AVG OP	TOTAL NUMBER EXCESS
3/13	4.3	0						
3/14	4.5	0						
3/15	4.1	0						
3/16	3.8	0						
3/17	4.0	0						
3/18	4.1	0						
3/19	4.0	0						
3/20	4.1	0						

INTEGRATED DRY NO_x/SO₂ EMISSIONS CONTROL SYSTEM

ENVIRONMENTAL MONITORING REPORT

**(Baseline and Baseline Urea Injection Test Periods)
(November 11, 1991 through December 15, 1991)
(February 3, 1992 through March 6, 1992)**

Appendix B

Aqueous Stream Compliance Data

EMITTER NAME/ADDRESS (Include Facility Name/Location if different)
AME PUBLIC SERVICE COMPANY OF COLORADO
ADDRESS P.O. BOX 840
DENVER, COLORADO 80201

FINAL

001A
DISCHARGE NUMBER

0001001
PERMIT NUMBER

MONITORING PERIOD
FROM YEAR 81 MO 11 DAY 01 TO YEAR 81 MO 11 DAY 30
(10-31) (11-30) (12-31) (1-31) (2-28) (3-31)

FACILITY ARAFANOE
LOCATION

NOTE: Read instructions before completing this form.

PARAMETER (12-37)	QUANTITY OR LOADING (15-61)			QUALITY OR CONCENTRATION (15-61)			NO. OF EX ANALYSIS (64-68)	FREQUENCY OF ANALYSIS (69-70)	SAMPLE TYPE (69-70)
	AVERAGE (46-51)	MAXIMUM (51-61)	UNITS	MINIMUM (18-45)	AVERAGE (46-51)	MAXIMUM (51-61)			
TEMPERATURE							0	20/30	
WATER DEG FAHRENHEI									
00011 1 0 0									
EFFLUENT GROSS VALU									
PH									INST
00400 1 0 0									
EFFLUENT GROSS VALU									
SOLIDS, TOTAL TSS									
SUSPENDED									
00530 1 0 0									
EFFLUENT GROSS VALU									
OIL AND GREASE									
FREON EXTR--GRAY MET									
00556 1 0 0									
EFFLUENT GROSS VALU									
ZINC, TOTAL									
(AS ZN)									
01092 1 0 0									
EFFLUENT GROSS VALU									
FLOW, IN CONDUIT OR									
THRU TREATMENT PLANT									
50050 1 0 0									
EFFLUENT GROSS VALU									
CHLORINE TOTAL									
RESIDUAL									
50060 1 0 0									
EFFLUENT GROSS VALU									
PRINCIPAL EXECUTIVE OFFICER	MCCOTTER, JAMES R.			SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT			AREA NUMBER YEAR MONTH DAY		
PRINCIPAL EXECUTIVE OFFICER	SR. V.P. CORP. AFF.			TELEPHONE			DATE		
TYPED OR PRINTED									

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY KNOWLEDGE OF THOSE MATERIALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 USC 1001 AND 18 USC 1011. I understand that these penalties may include fines up to \$10,000 and/or maximum imprisonment of between 6 months and 5 years.

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

NAME: FUMIC SERVICE COMPANY OF COLORADO
ADDRESS: P.O. BOX 070
DENVER, COLORADO 80201

FINAL

MONITORING PERIOD
FROM: 10/1/87 TO 11/30/87
YEAR: 1987
MONTH: 11
DAY: 30

NOTE: Read instructions before completing this form.

PARAMETER (12-17)	QUANTITY OR LOADING (16-51)			QUALITY OR CONCENTRATION (16-51)			NO. EX. (62-61)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
	AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM			
OIL AND GREASE VISUAL		0					0	4 / 30	
	EFFLUENT GROSS VALUE							1 / 7	VIS
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
James R. McCotter

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY KNOWLEDGE OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE INFORMATION SUBMITTED IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SERIOUS PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. 1001 AND 33 U.S.C. 1319. Offenders under these statutes may include fines up to \$100,000 and/or maximum imprisonment of between 6 months and 5 years.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)
(17-19)

NAME PUBLIC SERVICE COMPANY OF COLORADO
ADDRESS P.O. BOX 040
DENVER, COLORADO 80204

FINAL

MONITORING PERIOD
FROM 01/13/80 TO 01/19/80

NOTE: Read instructions before completing this form.

PARAMETER (17-17)	QUANTITY OR LOADING (16-31)			UNITS	QUALITY OR CONCENTRATION (14-41)			NO. EX (62-43)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
	AVERAGE	MAXIMUM	MINIMUM		AVERAGE	MAXIMUM	MINIMUM			
TEMPERATURE	NO DISCHARGE									
WATER DEG FAHRENHEI										
0011 1 0 0										
EFLUENT GROSS VAI	NO DISCHARGE									
0400 1 0 0										
EFLUENT GROSS VAI	NO DISCHARGE									
SOLIDS, TOTAL TSS										
SUSPENDED										
0530 1 0 0										
EFLUENT GROSS VAI	NO DISCHARGE									
IL AND GREASE										
0556 1 0 0										
REON EXTR-GRAV MET	NO DISCHARGE									
0556 1 0 0										
EFLUENT GROSS VAI	NO DISCHARGE									
INC. TOTAL										
092 1 0 0										
EFLUENT GROSS VAI	NO DISCHARGE									
LOW, IN CONDUIT OR										
THRU TREATMENT PLAN										
0950 1 0 0										
EFLUENT GROSS VAI	NO DISCHARGE									
CHLORINE TOTAL										
RESIDUAL										
0960 1 0 0										

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
OFFICER: JAMES R. SCOTTER, V.P. CORP. AFF.
DATE: 01/19/80

TELEPHONE:
 AREA NUMBER:
 CODE:
 YEAR:
 NO:
 DAY:

TYPED OR PRINTED

PERMIT NO. 9204662

PERMITTEE NAME/ADDRESS (Include city, State, Zip)
NAME WORLDWIDE SERVICE COMPANY OF COLORADO
ADDRESS P. O. BOX 840
DENVER, COLORADO 80201

FINAL

PERMIT NUMBER CO-0001094
DISCHARGE NUMBER 0020

MONITORING PERIOD
FROM 12/1 MP 07 TO 12/31 MP 30 DAY
(20-21) (22-23) (24-25) (26-27) (28-29) (30-31)

NOTE: Read instructions before completing this form.

PARAMETER (2-17)	(1 Cont Daily) QUANTITY OR LOADING (4-61)			(3 Cont Only) QUALITY OR CONCENTRATION (3-61)			NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
	AVERAGE (46-51)	MAXIMUM (47-50)	UNITS (48-50)	MINIMUM (49-51)	AVERAGE (46-51)	MAXIMUM (37-61)			
OIL AND GREASE VISUAL 04066 1 0 0 EFFLUENT GROSS VALUE									

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
MCCOTTER, JAMES R.
SR. V.P. CORP. AFF.

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
James R. McCotter

TELEPHONE AREA NUMBER 303 NUMBER 717161

DATE YEAR 91 MO 12 DAY 18

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SERIOUS PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 USC § 1001 AND 33 USC § 1319. If smaller under these statutes may include fines up to \$100,000 and/or maximum imprisonment of between 6 months and 3 years.

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

PHILIP SERVICE COMPANY OF COLORADO
 ADDRESS: P.O. BOX 114
 DENVER, COLORADO 80204

ACTIVITY: GRAPHOE
 LOCATION:

00-0004004
 Discharge Number

FINAL

MONITORING PERIOD

FROM: YEAR 81 MO 12 DAY 23 TO YEAR 81 MO 31 DAY 31
 (12/23/81) (12/31/81)

NOTE: Read instructions before completing this form.

PARAMETER (12.37)	(U Card Only) QUANTITY OR LOADING (14.61)			(U Card Only) QUANTITY OR CONCENTRATION (14.61)			NO. EX (67.41)	FREQUENCY OF ANALYSIS (62.48)	SAMPLE TYPE (69.70)
	AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM			
TEMPERATURE							0	19/31	
WATER DEG FARENHEI								5/7	INST
00011 1 0 0							0	19/31	
EFFLUENT GROSS VALU								5/7	GR
EFFLUENT GROSS VALU				7.850	8.180		0	19/31	
PH				6.500	9.000	SU		5/7	GR
00100 1 0 0							0	1/31	
EFFLUENT GROSS VALU				10.500	10.800			1/7	GR
SOLIDS, TOTAL TSS								1/7	GR
SUSPENDED				30.000	100.000	MG/L		1/7	GR
00530 1 0 0							0	4/31	
EFFLUENT GROSS VALU								1/7	GR
OIL AND GREASE								1/7	GR
FREON EXTR-GRAV NET								1/7	GR
00556 1 0 0							0	1/31	
EFFLUENT GROSS VALU				0.046	0.046			1/30	GR
ZINC, TOTAL								24/31	
(65 ZN)								30/30	INST
01092 1 0 0							0	4/31	
EFFLUENT GROSS VALU								1/7	GR
FLOW, IN CONDUIT OR								1/7	GR
THRU TREATMENT PLAN				0.217	0.662	(G3)		1/30	GR
50059 1 0 0				1.900				30/30	INST
EFFLUENT GROSS VALU								4/31	
CHLORINE TOTAL								1/7	GR
RESIDUAL									
50060 1 0 0							0	1/7	GR
EFFLUENT GROSS VALU									

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED THE INFORMATION SUBMITTED HEREIN AND BASED THEREON I BELIEVE THE INFORMATION IS TRUE AND ACCURATE. I BELIEVE THE INFORMATION SUBMITTED IS TRUE AND ACCURATE. I BELIEVE THE INFORMATION SUBMITTED IS TRUE AND ACCURATE. I BELIEVE THE INFORMATION SUBMITTED IS TRUE AND ACCURATE.

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

TYPED OR PRINTED

MCCOTTER, JAMES R.
 SR. V.P., CHIEF, AFF.

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Refer to all attachments here)

NAME PURIFIC-SERVICE-COMPANY-OF-COLORADO
 ADDRESS P.O. BOX 848
DENVER, COLORADO 80204

FACILITY GRAVHAGE
 LOCATION

PERMIT NUMBER 0001001
 DISCHARGE NUMBER 0014

FINAL

MONITORING PERIOD
 FROM YEAR 01 MONTH 01 DAY 01 TO YEAR 01 MONTH 10 DAY 14
 (20.21) (22.20) (24.24) (26.21) (28.20) (30.11)

NOTE: Read instructions before completing this form.

PARAMETER (22-27)	QUANTITY OR LOADING (46-51)			QUALITY OR CONCENTRATION (32-41)			NO. EX. ANALYSIS (62-61)	FREQUENCY OF ANALYSIS (64-63)	SAMPLE TYPE (68-70)
	AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM			
OIL AND GREASE VISUAL			1= YES 0= NO				0	4 / 3	
								1 / 7	VIS
EFFLUENT GROSS VALUE									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									
SAMPLE MEASUREMENT									
PERMIT REQUIREMENT									

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
 McCOTTER, JAMES R.
 SR. V.P., CORP. AFF.
 TYPED OR PRINTED

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
James R. McCotter

TELEPHONE

DATE

AREA CODE

LOCAL NUMBER

YEAR

MONTH

DAY

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY KNOWLEDGE OF THESE MATTERS I BELIEVE THE INFORMATION FOR OBTAINING THE PERMIT IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SERIOUS PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF THE AND IMPROPERLY USE IN U.S.C. § 1361 AND 33 USC § 1319. If violators under these statutes may include fines up to \$10,000 and/or imprisonment of not more than 6 months and 1 year.

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

NATIONAL POLLUTANTS DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)
(12-19)

FINAL

NOTE: Read instructions before completing this form.

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)
PHEMIC SERVICE COMPANY OF COLORADO
109-040
DENVER, COLORADO 80204

PERMIT NUMBER
0000000000

ANSA
mechanical number

MONITORING PERIOD
FROM YEAR 81 MO 01 DAY 01 TO YEAR 81 MO 13 DAY 31
(12-21) (12-29) (12-30) (1-30-81)

PARAMETER (37-37)	SAMPLE MEASUREMENT	QUANTITY OR LOADING (46-51)			QUALITY OR CONCENTRATION (34-61)			NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM			
TEMPERATURE		NO DISCHARGE								
WATER DEG FAHRENHEIT		NO DISCHARGE								
00011 1 0 0	PERMIT REQUIREMENT	NO DISCHARGE								
EFFLUENT GROSS VALUE	SAMPLE MEASUREMENT	NO DISCHARGE								
PH	PERMIT REQUIREMENT	NO DISCHARGE								
00400 1 0 0	SAMPLE MEASUREMENT	NO DISCHARGE								
EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	NO DISCHARGE								
SOLIDS, TOTAL TSS	SAMPLE MEASUREMENT	NO DISCHARGE								
SUSPENDED	PERMIT REQUIREMENT	NO DISCHARGE								
00530 1 0 0	SAMPLE MEASUREMENT	NO DISCHARGE								
EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	NO DISCHARGE								
OIL AND GREASE	SAMPLE MEASUREMENT	NO DISCHARGE								
FREON EXTR-GRAV MET	PERMIT REQUIREMENT	NO DISCHARGE								
00554 1 0 0	SAMPLE MEASUREMENT	NO DISCHARGE								
EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	NO DISCHARGE								
ZINC, TOTAL	SAMPLE MEASUREMENT	NO DISCHARGE								
(AS ZN)	PERMIT REQUIREMENT	NO DISCHARGE								
01092 1 0 0	SAMPLE MEASUREMENT	NO DISCHARGE								
EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	NO DISCHARGE								
FLOW, IN CONDUIT OR THRU TREATMENT PLAN	SAMPLE MEASUREMENT	NO DISCHARGE								
50050 1 0 0	PERMIT REQUIREMENT	NO DISCHARGE								
EFFLUENT GROSS VALUE	SAMPLE MEASUREMENT	NO DISCHARGE								
CHLORINE TOTAL RESIDUAL	PERMIT REQUIREMENT	NO DISCHARGE								
50060 1 0 0	SAMPLE MEASUREMENT	NO DISCHARGE								
EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	NO DISCHARGE								

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY KNOWLEDGE OF THOSE RESPONSIBLE IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SET IN USC 1301 AND 1315C & 1319. Penalties under these statutes may include fines up to \$100,000 and/or maximum imprisonment of between 6 months and 5 years.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
MCCOTTER, JAMES R.
SR. V.P., CORP. AFF.

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
TYPED OR PRINTED

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
3922948500
AREA NUMBER
92
YEAR
01
MO
DAY

TELEPHONE
DATE

NATIONAL POLLUTION CONTROL ADMINISTRATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)
(17.19)
0020
DISCHARGE NUMBER

FINAL

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)
PUBLIC SERVICE COMPANY OF GEORGIA
ADDRESS P. O. BOX 1140
HENNER, GEORGIA 30201

MONITORING PERIOD
FROM YEAR 81 MO 08 TO YEAR 81 MO 09
(20.21) (22.21) (24.25) (26.21) (28.29) (30.31)

NOTE: Read instructions before completing this form.

PARAMETER (32.17)	QUANTITY OR LOADING (34.61) (If Card Only)			QUALITY OR CONCENTRATION (34.61)			NO. EX (42.61)	FREQUENCY OF ANALYSIS (44.61)	SAMPLE TYPE (49.70)
	AVERAGE (46.51)	MAXIMUM (54.61)	UNITS	AVERAGE (46.51)	MINIMUM (48.41)	MAXIMUM (54.61)			
Oil and Grease	NO DISCHARGE								
Visual									
04066 1 0 0									
EFFLUENT GROSS VALUE									
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								

J. A. Withers, Jr.
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

10-2940500
AREA NUMBER

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY KNOWLEDGE OF THOSE MATERIALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THEFT ANY SUCH FALSE INFORMATION IS A VIOLATION OF FEDERAL LAWS AND IS PROHIBITED BY 18 U.S.C. 1001 AND 18 U.S.C. 1011. (Penalties under these statutes may include fines up to \$10,000 and/or imprisonment of between 6 months and 5 years.)

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
MCCUTTER, JAMES R.
SR. V.P., CORP. AFF.
TYPED OR PRINTED

TELEPHONE
DATE YEAR 81 MO 01 DAY 2

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
REPLACES EPA FORM T-68 WHICH MAY NOT BE USED.

EPA Form 3320-1 (Rev. 10-79) PREVIOUS EDITIONS TO BE USED UNTIL SUPPLY IS EXHAUSTED.

PAGE 2 OF

PERMITTEE NAME/ADDRESS (Include Facility Name/location if different)
 NAME
 ADDRESS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR) (17-19)

OMB No. 2040-1 Expires 3-31-88

FINAL

PERMIT NUMBER: 00110
 MONITORING PERIOD
 FROM: YEAR: 1980, MONTH: 03, DAY: 15 TO: YEAR: 1980, MONTH: 03, DAY: 31

FACILITY: ... LOCATION: ...

NOTE: Read instructions before completing this for

PARAMETER (17-17)	QUANTITY OR LOADING (16-11)			QUALITY OR CONCENTRATION (16-53)			NO. EX (16-47)	FREQUENCY OF ANALYSIS (16-48)
	AVERAGE (16-11)	MAXIMUM (16-11)	UNITS (16-11)	MINIMUM (16-53)	AVERAGE (16-53)	MAXIMUM (16-53)		
SAMPLE MEASUREMENT								
PERMIT REQUIREMENT		Inst. Max.						
SAMPLE MEASUREMENT								
PERMIT REQUIREMENT								
SAMPLE MEASUREMENT								
PERMIT REQUIREMENT								
SAMPLE MEASUREMENT								
PERMIT REQUIREMENT								
SAMPLE MEASUREMENT								
PERMIT REQUIREMENT								
SAMPLE MEASUREMENT								
PERMIT REQUIREMENT								
SAMPLE MEASUREMENT								
PERMIT REQUIREMENT								
SAMPLE MEASUREMENT								
PERMIT REQUIREMENT								
SAMPLE MEASUREMENT								
PERMIT REQUIREMENT								

NAME/TITLE: ...
 SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT: [Signature]
 TELEPHONE NUMBER: 107-2240500
 AREA CODE: 107
 YEAR: 80
 MONTH: 03

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)
 NAME
 ADDRESS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR) (12.19)
 PERMIT NUMBER
 DISCHARGE NUMBER

OMB No. 2040-4 Expires 3-31-88

FINAL

FACILITY LOCATION
 FROM (10/31/87) TO (10/31/87) MONITORING PERIOD (10/31/87) (10/31/87)
 YEAR MO DAY YEAR MO DAY
 (10) (31) (87) (10) (31) (87)

NOTE: Read instructions before completing this form

PARAMETER (02.02)	QUANTITY OR CONCENTRATION (10.01)			QUALITY OR CONCENTRATION (10.01)			NO. EX (02.01)	FREQUENCY OF ANALYSIS (02.03)
	AVERAGE (06.51)	MAXIMUM (06.52)	UNITS (06.53)	MINIMUM (06.54)	AVERAGE (06.55)	MAXIMUM (06.56)		
CHLORIDE	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
AMMONIA NITROGEN	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
AMMONIUM NITROGEN	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
NITRATE NITROGEN	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
NITRITES NITROGEN	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
COD	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
BOD	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
TOTAL SOLIDS	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
TOTAL DISSOLVED SOLIDS	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
TOTAL SUSPENDED SOLIDS	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
PH	7.0	7.0	UNITLESS	7.0	7.0	UNITLESS	1	1
TEMPERATURE	20.0	20.0	DEGREES CELSIUS	20.0	20.0	DEGREES CELSIUS	1	1
TOXIC SUBSTANCES	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
HEAVY METALS	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
ARSENIC	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
CADMIUM	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
COPPER	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
CHROMIUM	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
LEAD	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
MANGANESE	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
NICKEL	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
SILICA	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
ZINC	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
PHOSPHORUS	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
FLUORIDE	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
SEWAGE TREATMENT EFFLUENT	0.0	0.0	MG/L	0.0	0.0	MG/L	1	1
OTHER								

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY SAMPLED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY KNOWLEDGE OF THESE MATERIALS, I HAVE NOTIFIED THE AGENCY OF ANY OBTAINING THE INFORMATION IN MY REPORTS IN ACCORDANCE WITH THE PROVISIONS OF THE ACT AND I AM AWARE THAT THERE ARE CIVIL AND CRIMINAL PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 USC 1001 AND 18 USC 1011. I further certify that the data were collected from the facility and are representative of the discharge over the period specified.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
 SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER
 DATE

TELEPHONE NUMBER
 AREA CODE NUMBER YEAR MO

301 290 8500 92 03

TYPE OR PRINTED

COMMITTEE AND EXPLANATION OF ANY VIOLATIONS (Reference all other forms here)

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)
 NAME THE U.S. AIR FORCE
 ADDRESS 1111 10th St

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR)
 (2-16) 00000
 PERMIT NUMBER

OMB No. 2040-00
 Expires 3-31-88

FINAL

MONITORING PERIOD
 FROM YEAR 1983 MONTH 01 DAY 01 TO YEAR 1983 MONTH 01 DAY 01

FACILITY NAME/ADDRESS (Include Location)
1111 10th St

NOTE: Read Instructions before completing this form

PARAMETER (2-17)	AVERAGE (46-51)			MAXIMUM (46-51)			MINIMUM (48-45)			QUALITY OR CONCENTRATION (34-41)			NO. EX (42-43)	FREQUENCY ANALYSIS (44-48)	DATE
	AVERAGE	MAXIMUM	UNITS	AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS					
<input checked="" type="checkbox"/> SAMPLE MEASUREMENT															
<input type="checkbox"/> PERMIT REQUIREMENT															
<input type="checkbox"/> SAMPLE MEASUREMENT															
<input type="checkbox"/> PERMIT REQUIREMENT															
<input type="checkbox"/> SAMPLE MEASUREMENT															
<input type="checkbox"/> PERMIT REQUIREMENT															
<input type="checkbox"/> SAMPLE MEASUREMENT															
<input type="checkbox"/> PERMIT REQUIREMENT															
<input type="checkbox"/> SAMPLE MEASUREMENT															
<input type="checkbox"/> PERMIT REQUIREMENT															
<input type="checkbox"/> SAMPLE MEASUREMENT															
<input type="checkbox"/> PERMIT REQUIREMENT															
<input type="checkbox"/> SAMPLE MEASUREMENT															
<input type="checkbox"/> PERMIT REQUIREMENT															

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
DR. V.P. GORE, JR.
 SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
[Signature]
 TELEPHONE AREA CODE 703 NUMBER 7208500 YEAR 83 MO 01
 COMMENT AND EXPLANATION OF ANY VIOLATIONS (Refer to all attachments here)
 I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION CONTAINED HEREIN AND I BELIEVE ON MY KNOWLEDGE OF THESE MATTERS, INDICATELY RESPONSIBLE FOR PREPARING THE INFORMATION I ENTERED. THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT IF ANY ONE OF THESE STATEMENTS IS FALSE, I AM SUBJECT TO PERSECUTION UNDER THE FEDERAL PENALTY LAWS AND AM SUBJECT TO PERSECUTION UNDER THE FEDERAL PENALTY LAWS. (Penalties under these statutes may include fines up to \$10,000 and/or imprisonment of not more than 5 years.)
 TYPED OR PRINTED

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

FINAL

11-0000001
PERMIT NUMBER

00004
DISCHARGE NUMBER

MONITORING PERIOD
YEAR 72 MO 03 DAY 01 TO YEAR 72 MO 03 DAY 31

NOTE: Read instructions before completing this form.

PARAMETER (32-7)	QUANTITY OR LOADING (46-51)			QUALITY OR CONCENTRATION (54-61)			NO. EX. ANALYSIS (62-63)	FREQUENCY (64-66)	SAMPLE TYPE (69-70)
	AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM			
000001							0	25/31	
000002							0	5/7	INST
000003							0	25/31	
000004							0	5/7	GR
000005							0	5/31	
000006							0	1/7	BHR (DMI)
000007							0	5/31	
000008							0	1/7	GR
000009							0	1/31	
000010							0	46/31	
000011							0	30/30	INST
000012							0	5/31	
000013							0	1/7	GR

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER: JACOTTER, JAMES R.
OFFICER OR AUTHORIZED AGENT: [Signature]

TELEPHONE: [Area Code] [Number] [Number]

DATE: YEAR 72 MO 04 DAY 17

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)
(12.19)

FINAL

PERMIT NUMBER
0000000000

DISCHARGE NUMBER
00000

MONITORING PERIOD
FROM (12.19) (12.19) (12.19) TO (12.19) (12.19) (12.19)

NOTE: Read instructions before completing this form.

PARAMETER (32-17)	QUANTITY OR LOADING (46-51)			QUALITY OR CONCENTRATION (34-61)			NO. EX. (62-63)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
	AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM			
TOTAL GROSS WASTE	SAMPLE MEASUREMENT						0	5 / 31	
	PERMIT REQUIREMENT								
EFFLUENT GROSS WASTE	SAMPLE MEASUREMENT								VIS
	PERMIT REQUIREMENT								
TOTAL GROSS WASTE	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
EFFLUENT GROSS WASTE	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TOTAL GROSS WASTE	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
EFFLUENT GROSS WASTE	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TOTAL GROSS WASTE	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
EFFLUENT GROSS WASTE	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TOTAL GROSS WASTE	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
EFFLUENT GROSS WASTE	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
J. J. [Signature]

TELEPHONE
703 294 8500

DATE
07 04 87

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INSPECTION OF THESE RECORDS I HAVE DETERMINED THAT THE INFORMATION CONTAINED HEREIN IS TRUE, ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF. I AM AWARE THAT ANY FALSIFICATION OF THIS INFORMATION IS A VIOLATION OF FEDERAL LAWS AND REGULATIONS. I AM AWARE THAT ANY FALSIFICATION OF THIS INFORMATION IS A VIOLATION OF FEDERAL LAWS AND REGULATIONS. I AM AWARE THAT ANY FALSIFICATION OF THIS INFORMATION IS A VIOLATION OF FEDERAL LAWS AND REGULATIONS.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)
(12.19)

FINAL

NOTE: Read instructions before completing this form.

DISCHARGE NUMBER
0020

MONITORING PERIOD

FROM: YEAR 1977, MO 11, DAY 29
TO: YEAR 1977, MO 12, DAY 31
(20.2) (22.3) (24.5) (26.7) (28.9) (30.11)

MITTEE NAME/ADDRESS (include
ity Name/location if different)
ME 11111
DRESS P. O. BOX 230
DIVER COLLEGE

CITY ACADEMIE
CATION

PARAMETER (32.1)	QUANTITY OR LOADING (46.5)			QUALITY OR CONCENTRATION (46.5)			NO. EX (62.4)	FREQUENCY OF ANALYSIS (62.4)	SAMPLE TYPE (69.7)
	AVERAGE (46.5)	MAXIMUM (46.5)	UNITS (46.5)	MINIMUM (46.5)	AVERAGE (46.5)	MAXIMUM (46.5)			
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
SAMPLE MEASUREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)
PERMIT REQUIREMENT	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(46.5)	(62.4)	(62.4)	(69.7)

TELEPHONE

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER
OFFICER OR AUTHORIZED AGENT

DATE: YEAR 1977, MO 12, DAY 17

1022948500

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY FRAMED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY KNOWLEDGE OF THESE INDIVIDUALS, I BELIEVE THE INFORMATION CONTAINED HEREIN IS TRUE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR PROVIDING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 USC § 1001 AND 33 USC § 1319. Offenders under these statutes may include fines up to \$10,000 and/or maximum imprisonment of between 6 months and 3 years.

IDENTIFICATION AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

TYPED OR PRINTED NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
SCOTTER, JAMES R.
R. V.P. CORP., AFF.

FINAL

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)
EPA FORM 402 (12-79)

PERMIT NUMBER: 0000000000
DISCHARGE NUMBER: 0000

MONITORING PERIOD
FROM: YEAR 1980, MONTH 12, DAY 20 TO YEAR 1980, MONTH 12, DAY 31

NOTE: Read instructions before completing this form.

PARAMETER (32-37)	AVERAGE (46-51)			QUANTITY OR LOADING (54-61)			QUALITY OR CONCENTRATION (46-51)			NO. EX. ANALYSIS (64-68)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
	MAXIMUM	MINIMUM	UNITS	MAXIMUM	MINIMUM	UNITS	MAXIMUM	MINIMUM	UNITS			
SULFUR DIOXIDE												
PHOSPHORUS												
AMMONIA NITROGEN												
...												

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY KNOWLEDGE AND BELIEFS, I BELIEVE THE INFORMATION SUBMITTED IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 USC 1001 AND 33 USC 1311b. (Signatories under this heading may include firms up to 2000 employees or maximum employment of 1000 or more employees.)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
James R. Cotter

TELEPHONE NUMBER: 703-290-8500
AREA CODE: 703

INTEGRATED DRY NO_x/SO₂ EMISSIONS CONTROL SYSTEM

ENVIRONMENTAL MONITORING REPORT

**(Baseline and Baseline Urea Injection Test Periods)
(November 11, 1991 through December 15, 1991)
(February 3, 1992 through March 6, 1992)**

Appendix C

Burner Baseline Data Summary

Table 5-1. Summary of Parametric Baseline Tests

Test No.	Date & Time	Control Room Data			Mills	Steam Flow	Gaseous Emissions					Ash Carbon					
		Load	O2 % wet	Opacity %			O2 Econ Out	CO ppm	NOx ppm@3%	CO2 %	SO2c ppm@3%	O2 AHD %	O2 Stack %	Fly Ash %	Bottom Ash %	Beg House %	
1	11/11/91 09:35	104	3.15	2.0		R40	78	766	13.50	379	3.30	3.65					
2	11/11/91 14:44	104	3.40	2.0		R30	38	862	13.00	384	4.30	4.40					5.02
3	11/11/91 17:04	104	4.55	2.0		R40	34	1061	11.70	367	5.80	5.90					
4	11/12/91 13:32	100	3.30	2.0		R40	41	874	12.90	394	4.80	5.05					8.15
5	11/12/91 15:27	100	2.25	2.0		R40	210	769	13.60	412	4.15	4.35					
6	11/13/91 14:25	100	3.30	2.0		R70	44	825	14.60	388	4.10	4.55					
7	11/13/91 16:24	99	3.40	2.0		R65	47	849	14.52	394	4.25	4.70					
8	11/14/91 09:08	101	3.35	2.3		R70	40	834	14.20	380	4.20	4.65					8.85
9	11/14/91 16:37	100	3.30	2.0		R70	60	804	14.23	399	4.30	4.65					
10	11/15/91 09:37	99	3.50	3.0		R65	60	780	14.60	370	4.15	4.45					
11	11/16/91 08:11	81	3.90	3.0		R82	38	752	14.27	395	4.55	4.70					3.88
12	11/16/91 13:00	79	2.90	2.5		R83	112	659	15.08	394	3.70	4.00					0.30
13	11/16/91 15:45	80	5.10	3.0		R85	37	901	13.20	361	5.70	5.75					0.55
14	11/17/91 08:05	59	4.90	2.5	B	A55	43	749	13.35	382	5.50	5.70					2.99
15	11/17/91 10:43	58	3.60	2.0	B	A50	85	624	14.28	394	4.35	4.75					6.39
16	11/17/91 12:49	58	6.10	2.5	B	A45	38	916	12.38	380	6.55	6.78					
17	11/17/91 14:28	58	5.70	2.5	C	A50	37	898	12.50	380	6.22	6.50					
18	11/17/91 16:09	58	5.10	2.5	C	A45	37	790	13.13	402	5.80	5.97					
19	11/19/91 08:16	100	3.40	3.0	A	R70	70	938	14.60	585	4.00						
20	11/19/91 09:00	100	3.50	3.0	A	R70	1000	722	14.20	571	4.30	5.01					
21	11/19/91 11:30	99	3.50	2.5	A	R65	75	976	14.45	542	4.30	4.65					
22	11/19/91 13:13	99	3.50	2.0	B	R70	95	925	14.65	537	4.10	4.30					
23	11/19/91 14:55	100	3.10	2.0	C	R70	50	895	14.78	523	3.95	4.45					
24	11/19/91 16:32	100	3.30	2.0	D	R70	75	891	14.80	508							
25	11/19/91 17:30	100	3.50	3.0		R65	50	832	14.60	483							
26	11/19/91 22:50	80	4.40	3.0		R72	35	782	13.95	457	4.90	5.55					
27	11/20/91 00:24	79	4.40	3.0	A	R75	43	840	13.68	440	5.15	5.70					
28	11/20/91 02:00	80	4.80	2.5	B	R80	43	824	13.75	468	5.05	5.55					
29	11/20/91 03:48	80	4.40	2.5	C	R80	38	815	14.03	414							
30	11/20/91 05:03	79	4.30	2.5	D	R80	40	814	14.05	415							
31	11/21/91 08:45	101	2.80	2.5		R85	105	756	15.00	390	3.82	3.85					10.94
32	11/21/91 11:41	101	4.10	2.0		R90	37	891	14.15	391	4.75	4.85					4.35
33	11/21/91 14:43	100	5.10	2.0		R90	35	1049	13.20	379	5.80	5.85					3.48
34	12/03/91 09:00	99	3.93	2.3		R77	450	800	14.40	418	4.40	4.58					0.78
35	12/04/91 09:00	100	3.98	2.0		R82	43	839	14.20	411	4.55	5.13					1.13
36	12/05/91 09:00	100	3.85	2.0		R75	43	845	14.30	468	4.33	4.83					0.53
37	12/07/91 08:30	79	3.87	2.0		R80	41	737	14.30	570	4.40	4.70					2.82
38	12/08/91 09:00	61	4.73	2.3	C	500	35	712	13.30	570	5.50	5.75					2.58

INTEGRATED DRY NO_x/SO₂ EMISSIONS CONTROL SYSTEM

ENVIRONMENTAL MONITORING REPORT

**(Baseline and Baseline Urea Injection Test Periods)
(November 11, 1991 through December 15, 1991)
(February 3, 1992 through March 6, 1992)**

Appendix D

Urea Injection Baseline Data Summary

Appendix 4 Baseline Urea Data Summary

Test Lead	MAs	CRO2	Steam	Chem-	Inject	NAND	Chem	Total	Inj Air	LIq	OH	Alt	OH	O2	CO	COc	NOx	NOx	CO2	SO2	SO2c	N2Oc	MH3	MH3	MH3	AN2O/	AN2O/	AN2O/
MW%	OCs	% wet	e/ftph	ical	Level	gm	gm	ppm	pskg	Inch	Inch	Inch	Inch	%	ppm	ppm@3%	ppm	ppm@3%	%	ppm	ppm@3%	ppm(1)	ppm(2)	ppm(3)	%	%	%	
142	62	B	6.50	518	Urea	1	0.46	0.60	7	0	0.046	1.5	7.15	5.1	68	470	611	11.7	262	341	34	28	7	29.3	0.13	25		
142	62	B	6.50	518	Urea	1	0.46	0.60	7	0	0.046	1.5	7.15	5.1	68	472	613	11.7	260	338	34	31	4	29.1	0.12	25		
142	62	B	6.50	518	Urea	1	0.46	0.60	7	0	0.046	1.5	7.10	5.0	65	480	622	11.8	262	339	33	33	5	28.0	0.13	24		
143	100		3.87	878	Urea	1	0.00	0.00	0	0	0.046	1.5	4.68	3.6	40	745	822	14.2	333	367	4	0	0	0.0		0		
144	99		4.27	875	Urea	1	0.95	2.05	19	0	0.046	1.5	5.15	6.1	69	420	477	13.6	320	363	61	0	0	46.0	0.12	20		
145	98		4.00	875	Urea	1	0.98	2.05	16	0	0.046	1.5	5.15	5.9	67	425	483	13.6	315	358	50	10	0	48.0	0.11	27		
146	99		4.03	875	Urea	1	0.95	2.05	13	0	0.046	1.5	5.15	5.5	63	445	505	13.6	320	363	45	6	0	43.5	0.11	23		
147	99		4.15	875	Urea	1	0.95	2.05	10	0	0.046	1.5	5.20	5.3	60	462	526	13.5	318	362	41	4	0	41.2	0.10	20		
148	99		4.15	875	Urea	1	0.95	2.05	7	0	0.046	1.5	5.35	5.0	58	500	575	13.3	315	362	36	1	0	35.7	0.10	18		
149	99		4.32	875	Urea	1	0.95	2.05	7	0	0.046	1.5	5.25	5.1	58	510	583	13.5	311	356	38	0	0	34.8	0.11	18		
150	99		4.25	875	Urea	1	0.51	1.10	7	0	0.046	1.5	5.20	4.3	49	583	664	13.5	315	359	24	0	3	25.7	0.07	9		
151	99		4.15	878	Urea	1	1.44	3.10	7	0	0.046	1.5	5.25	5.5	63	473	540	13.6	305	349	45	1	15	38.6	0.11	23		
152	99		4.10	880	Urea	1	1.90	4.10	7	0	0.046	1.5	5.20	5.8	66	455	518	13.5	295	336	50	0	0	42.1	0.12	28		
153	99		3.95	880	Urea	1	0.00	0.00	0	0	0.046	1.5	5.00	3.5	39	795	894	13.7	310	349	4	1	0	0.0		-1		
154	99	B	3.97	880	Urea	1	0.00	0.00	0	0	0.046	1.5	4.80	3.5	39	838	931	14	318	353	4	0	0	0.0		-1		
155	99	B	4.00	880	Urea	1	1.02	2.30	16	0	0.046	1.5	4.95	6.3	71	460	516	13.8	323	362	55	5	15	44.8	0.12	32		
156	99	B	4.05	880	Urea	1	1.02	2.30	10	0	0.046	1.5	5.08	5.8	66	505	571	13.7	320	362	48	4	11	38.7	0.12	27		
157	101		3.85	892	Urea	1	0.00	0.00	0	0	0.046	1.5	4.70	3.5	39	784	868	14.1	424	489	5	0	0	0.0		-1		
158	100		3.58	883	Urea	1	1.04	2.20	16	0	0.046	1.5	4.00	6.0	64	427	470	14	433	477	47	3	8	45.9	0.11	28		
159	101		3.58	885	Urea	1	1.03	2.20	16	0	0.046	1.5	4.30	6.3	88	406	437	14.4	445	479	52	12	3	49.7	0.11	30		
160	100		3.35	887	Urea	1	1.04	2.20	16	0	0.046	1.5	4.80	6.6	72	419	453	14.4	459	496	48	18	7.8	47.6	0.11	34		
161	100		3.88	892	Urea	1	1.04	2.20	16	0	0.046	1.5	4.60	6.0	66	496	478	14.2	457	500	46	18	7.3	44.2	0.13	28		
162	100		3.83	890	Urea	1	1.04	2.20	16	0	0.046	1.5	4.80	6.1	67	438	480	14.1	448	489	43	10	7.1	44.8	0.12	28		
163	100		3.68	890	Urea	1	0.00	0.00	0	0	0.046	1.5	4.40	6.0	65	455	493	14.1	444	481	47	10	0	42.5	0.12	27		
164	100		3.85	890	Urea	1	0.00	0.00	0	0	0.046	1.5	4.80	3.4	37	781	857	14.1	448	491	6	1	0	0.0		-1		
165	99		3.87	875	Urea	1	0.00	0.00	0	0	0.046	1.5	5.00	3.5	39	780	867	13.8	335	376	5	0	0	0.0		-1		
166	99		4.11	875	NH4OH	1	0.51	2.10	7	0	0.046	1.5	4.90	3.8	43	620	693	13.9	340	381	7	0	0	20.1	-0.01	4		
167	99		4.05	878	NH4OH	1	0.99	4.10	7	0	0.046	1.5	4.95	4.3	48	578	648	13.9	340	382	8	0	0	25.3	0.00	0		
168	99		4.28	878	NH4OH	1	1.41	5.80	7	0	0.046	1.5	4.80	4.5	50	520	577	13.7	340	378	12	5	5	33.4	0.02	11		
168	99		4.17	878	NH4OH	1	0.54	2.20	18	0	0.046	1.5	5.00	4.0	45	563	633	13.8	343	386	9	1	1	28.7	0.00	0		
170	100		4.43	880	NH4OH	1	1.00	4.10	18	0	0.046	1.5	5.20	3.6	41	523	585	13.8	343	390	11	1	1	31.1	0.01	2		
171	100		4.30	880	NH4OH	1	1.42	5.80	18	0	0.046	1.5	5.00	3.8	43	483	544	13.4	344	387	14	4	4	37.0	0.02	4		
172	100		3.98	878	NH4OH	1	0.00	0.00	0	0	0.046	1.5	5.10	6.3	71	785	863	13.8	338	381	5	0	0	0.0		-1		
173	80		4.98	885	NH4OH	1	0.00	0.00	0	0	0.046	1.5	5.55	4.0	47	630	734	13.3	320	373	6	0	0	0.0		-1		
174	80		5.04	885	NH4OH	1	0.00	0.00	0	0	0.046	1.5	5.75	3.0	35	725	856	13	325	384	6	0	0	0.0		-1		
175	80		5.21	883	NH4OH	1	0.46	1.50	7	0	0.046	1.5	6.18	3.3	40	524	636	12.8	330	401	9	1	1	25.7	0.00	5		
176	61	B	6.24	513	NH4OH	1	0.00	0.00	0	0	0.046	1.5	6.80	3.2	40	696	870	12.3	313	381	5	0	0	0.0		-1		
177	61	B	6.02	513	NH4OH	1	0.48	1.20	7	0	0.046	1.5	6.85	3.5	44	434	544	12.3	314	383	10	15	15	37.5	0.00	4		
178	61	B	5.78	515	NH4OH	1	0.86	2.40	7	0	0.046	1.5	6.48	4.0	50	318	394	12.4	285	354	15	46	46	54.7	0.02	10		
178	61	B	5.97	518	NH4OH	1	1.44	3.60	7	0	0.046	1.5	6.72	4.2	53	254	320	12.2	251	317	19	178	178	83.2	0.02	13		
180	81	B	5.85	518	NH4OH	1	1.92	4.80	7	0	0.046	1.5	6.80	4.5	57	210	286	12.2	208	263	23	263	263	86.4	0.03	17		
181	81	B	5.71	518	NH4OH	1	0.00	0.00	0	0	0.046	1.5	6.50	3.3	41	687	853	12.4	265	329	5	5	5	0.0		-1		

(1): Data corrected for CO2 interference on MDIR analyzer
 (2): Continuous MH3 analyzer
 (3): Wet chemical composite data

Aerosols 4 Baseline Urea Data Summary

Test Load	Mtbs	CRO2	Sleam	Chem-	Inject	NANO	Chem	Total	Wj Air	Iq Off	Air Off	O2	CO2	N2O	N2Oe	Mt3	Mt3	Mt3	Mt3	AN2O/	ACO
Mtbs	CO2	% wet	e4pph	lcal	Level	ppm	ppm	ppm	ppkg	inch	inch	%	ppm	ppm@3%	ppm(1)	ppm(2)	ppm(3)	%	AN2O/	ACO	
51 100	C	4.10	864	Urea	2	0.00	0.00	0	0	0.094	1.625	5.05	42	47	805	908	13.8	360	406	0.0	0
52 100	C		870	Urea	2	0.00	0.00	0	0	0.094	1.625	5.01	43	48	800	901	13.8	356	401	0.0	0
53 100	C		870	Urea	2	0.00	0.00	0	12	0.094	1.625	5.25	43	49	798	914	13.6	347	397	-0.7	1
54 100	C		870	Urea	2	0.00	0.00	28	12	0.094	1.625	5.01	44	50	790	889	13.8	352	396	2.1	2
55 99	C	3.90	875	Urea	2	1.13	2.50	28	12	0.094	1.625	5.17	65	74	606	689	13.8	130	148	24.1	28
56 101		4.05	880	Urea	2	0.00	0.00	0	0	0.094	1.625	4.95	41	48	764	857	13.8	350	399	2.4	0
57 101		4.20	865	Urea	2	0.00	0.00	0	0	0.094	1.625	5.08	38	43	795	899	13.8	358	405	-2.4	0
58 100		4.30	865	Urea	2	1.02	2.20	28	12	0.094	1.625	5.22	68	78	585	644	13.7	180	182	26.7	35
59 101		4.20	890	Urea	2	1.01	2.20	28	8	0.094	1.625	5.25	72	82	587	649	13.6	159	181	26.1	39
60 100		4.10	875	Urea	1	0.00	0.00	0	0	0.094	1.25	5.00	38	43	804	905	13.7	362	362	-0.2	0
61 100		4.10	870	Urea	1	1.98	4.40	28	8	0.094	1.25	5.03	94	108	303	341	13.9	319	359	82.3	83
62 101		4.06	885	Urea	1	1.47	3.30	28	8	0.094	1.25	5.01	84	95	350	393	13.8	342	384	58.5	52
63 101		4.04	888	Urea	1	0.98	2.20	28	8	0.094	1.25	4.86	80	89	384	428	13.9	358	358	52.8	48
64 101		3.95	890	Urea	1	0.49	1.10	28	8	0.094	1.25	4.88	68	74	502	559	13.9	374	417	38.1	31
65 101		4.01	888	Urea	1	0.00	0.00	0	0	0.094	1.25	5.00	39	44	801	901	13.9	360	405	0.3	1
66 100		4.01	870	Urea	1	0.00	0.00	0	0	0.088	1.25	4.90	38	43	782	874	14.1	352	394	1.1	0
67 100		4.06	870	Urea	1	2.00	4.35	28	12	0.088	1.25	4.91	89	100	304	340	13.9	315	353	81.5	57
68 100		3.78	888	Urea	1	1.50	3.25	28	12	0.088	1.25	4.89	82	92	335	375	13.8	330	369	57.8	48
69 100		3.86	870	Urea	1	0.99	2.15	28	12	0.088	1.25	4.88	73	82	403	453	13.9	334	375	48.8	39
70 100		3.89	870	Urea	1	0.50	1.08	28	12	0.088	1.25	5.00	58	65	527	593	13.8	357	401	32.8	22
71 100		4.12	870	Urea	1	0.00	0.00	0	0	0.088	1.25	4.97	39	44	798	894	13.8	348	392	-1.1	1
72 112		4.03	960	Urea	1	0.00	0.00	0	0	0.088	1.5	4.89	37	41	848	948	13.9	439	491	0.0	0
73 111		3.82	965	Urea	1	0.45	1.17	28	8	0.088	1.5	4.92	45	50	642	718	13.9	441	493	24.3	18
74 111		3.90	965	Urea	1	0.68	1.77	28	8	0.088	1.5	4.93	49	55	582	652	13.8	441	494	31.2	0
75 111		4.04	970	Urea	1	0.91	2.34	28	8	0.088	1.5	4.88	53	59	541	604	13.9	450	502	38.3	11
76 111		4.00	975	Urea	1	0.00	0.00	28	8	0.088	1.5	4.89	37	41	835	933	13.8	433	484	1.8	-0.82
77 111		4.05	975	Urea	1	1.13	2.82	28	8	0.088	1.5	4.96	58	65	502	563	13.9	470	527	40.8	13
78 111		4.20	975	Urea	1	0.91	2.36	28	12	0.088	1.5	5.15	52	59	532	604	13.8	463	528	36.3	12
79 111		4.11	975	Urea	1	0.45	1.17	28	12	0.088	1.5	5.15	42	48	653	741	13.7	451	512	21.8	7
80 100		4.17	872	Urea	1	0.00	0.00	0	0	0.088	1.5	4.84	35	39	820	913	13.9	460	512	-1.4	0.03
81 101		3.85	875	Urea	1	0.51	1.15	28	8	0.088	1.5	4.53	50	55	580	612	14.3	479	523	32.0	17
82 101		3.69	875	Urea	1	0.78	1.70	28	8	0.088	1.5	4.48	58	63	482	524	14.4	468	509	41.8	12
83 101		3.75	875	Urea	1	0.00	0.00	28	8	0.088	1.5	4.65	37	41	787	844	14.3	483	532	28.4	18
84 101		4.05	875	Urea	1	1.02	2.30	28	8	0.088	1.5	4.95	64	72	428	482	14	489	526	48.4	13
85 100		4.06	872	Urea	1	1.53	3.40	28	8	0.088	1.5	4.93	70	78	381	428	14	489	515	52.7	16
86 101		4.10	875	Urea	1	1.51	3.40	28	12	0.088	1.5	4.95	68	76	379	425	13.9	455	510	52.8	14
87 101		4.11	875	Urea	1	1.02	2.30	28	12	0.088	1.5	5.17	61	69	438	498	13.8	467	531	44.7	12
88 101		4.28	877	Urea	1	0.51	1.15	28	12	0.088	1.5	5.20	47	54	557	635	13.7	485	538	28.4	18
89 100		4.41	879	Urea	1	0.00	0.00	0	0	0.088	1.5	5.10	33	37	833	943	13.8	488	521	-4.8	0.00
90 80		4.02	870	Urea	1	0.52	0.75	28	8	0.088	1.5	4.86	37	41	669	746	13.9	403	449	0.0	0
91 79		4.16	870	Urea	1	0.77	1.12	28	8	0.088	1.5	5.23	58	66	443	505	13.4	480	457	32.3	13
92 79		4.18	872	Urea	1	0.77	1.12	28	8	0.088	1.5	5.18	65	74	373	424	13.7	368	419	43.2	14
93 79		3.84	872	Urea	1	1.08	1.56	28	8	0.088	1.5	5.03	73	82	314	354	13.8	324	385	53.5	15
94 79		4.04	872	Urea	1	1.08	1.58	28	12	0.088	1.5	5.04	73	82	309	349	13.8	324	385	53.2	14
95 79		4.27	872	Urea	1	0.00	0.00	28	8	0.088	1.5	5.15	35	40	672	783	13.7	383	435	-2.3	0.04
96 79		4.19	873	Urea	1	1.58	2.28	28	8	0.088	1.5	5.28	45	52	322	368	13.7	313	358	50.7	11
97 79		4.22	875	Urea	1	1.04	1.51	28	8	0.088	1.5	5.39	68	80	338	388	13.5	305	352	47.9	15
98 79		4.25	875	Urea	1	1.04	1.51	28	8	0.088	1.5	5.32	63	72	380	438	13.5	300	344	41.8	15

INTEGRATED DRY NO_x/SO₂ EMISSIONS CONTROL SYSTEM

ENVIRONMENTAL MONITORING REPORT

**(Baseline and Baseline Urea Injection Test Periods)
(November 11, 1991 through December 15, 1991)
(February 3, 1992 through March 6, 1992)**

Appendix E

Particulate Data Analysis

Table 7-2

AVERAGE BAGHOUSE INLET PARTICLE SIZE DISTRIBUTION

<u>Aerodynamic Diameter</u>	<u>Cumulative Weight (%)</u>	<u>dM/dLOG(D_g,mg/SCFM,dry)</u>
0.20 (microns)	0.4	25.7
0.25	0.4	21.0
0.40	0.5	5.7
0.50	0.5	17.9
0.75	0.7	59.5
1.00	0.8	111.0
1.50	1.5	322.5
2.00	2.3	419.0
2.50	3.0	482.4
4.00	5.6	1296.3
5.00	8.6	2388.1
7.50	19.9	5350.9
10.0	36.2	12020.9
15.0	72.8	10967.7
20.0	90.6	5946.2
25.0	97.2	2546.2
40.0	100.0	48.9
50.0	100.0	0.4

Table 7-3

AVERAGE BAGHOUSE EXIT PM₁₀ RESULTS

<u>Parameter</u>	<u>Average Value</u>
Flow Rate (SCFM, dry)	254,864
Temperature (°F)	261
PM ₁₀ Concentration (gr/SCF, dry)	0.0043
Emissions (lb/hr)	9.5

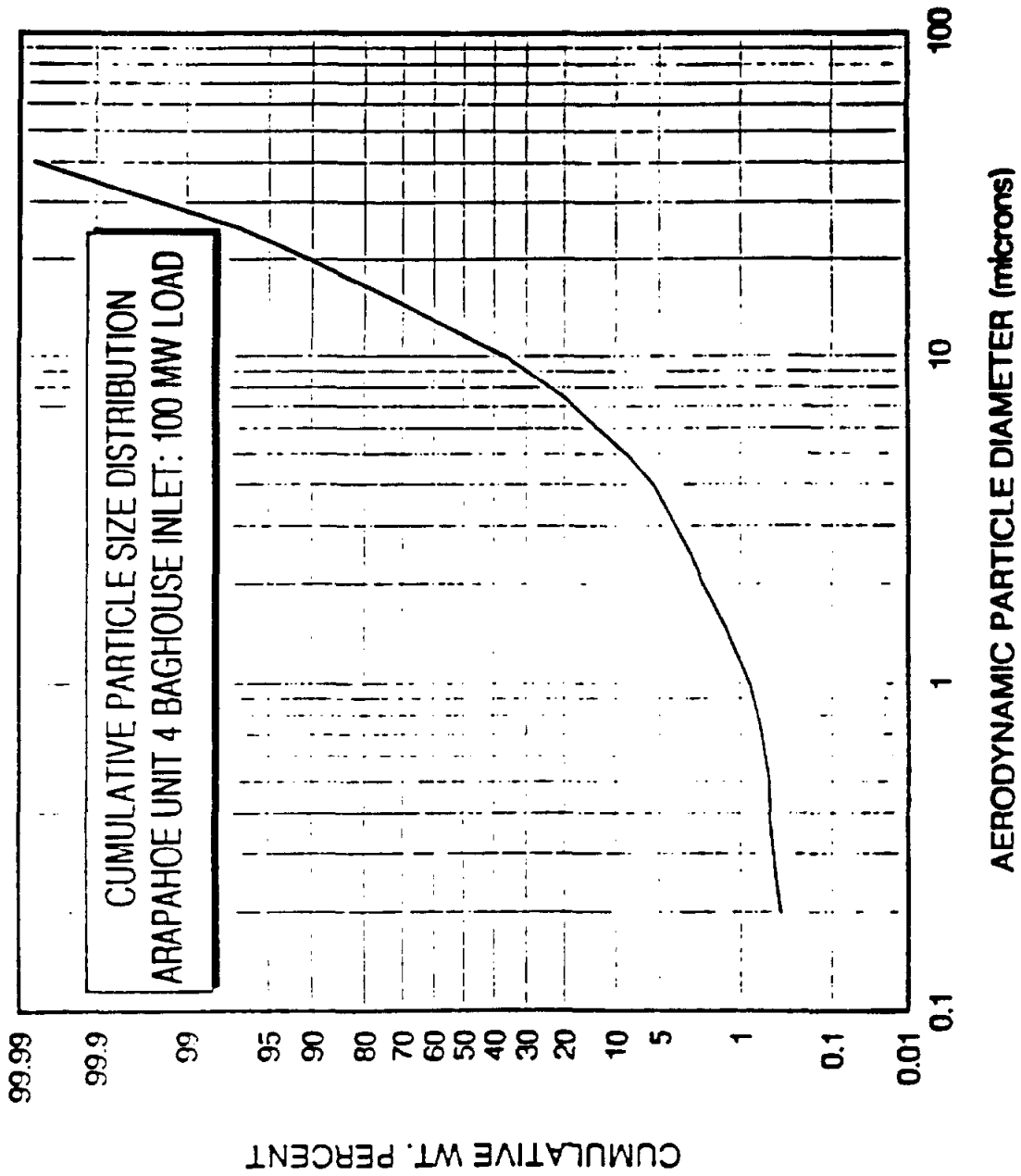


Figure 7-5. Baghouse Inlet Particulate Size Distribution.

INTEGRATED DRY NO_x/SO₂ EMISSIONS CONTROL SYSTEM

ENVIRONMENTAL MONITORING REPORT

**(Baseline and Baseline Urea Injection Test Periods)
(November 11, 1991 through December 15, 1991)
(February 3, 1992 through March 6, 1992)**

Appendix F

Coal/Ash Analysis

Table 4-1

PSCC ARAPAHOE UNIT 4 BASELINE COAL ANALYSIS

Test Number	2	21	35	
Date	11/11/91	11/19/91	12/4/91	Averages
Proximate Analysis				
%Moisture	10.11	11.53	11.34	10.99
%Ash	10.39	7.75	8.98	9.04
%Volatile	35.02	35.28	34.98	35.09
%Fixed Carbon	<u>44.48</u>	<u>45.44</u>	<u>44.70</u>	<u>44.87</u>
Total	100.00	100.00	100.00	100.00
HHV, Btu/lb	11106	11076	11108	11097
FCV	1.27	1.29	1.28	1.28
Prox Analysis, MAF				
%Volatile	44.05	43.71	43.90	43.89
%Fixed Carbon	55.95	56.29	56.10	56.11
HHV, Btu/lb	13970	13722	13941	13877
Ultimate Analysis				
%Carbon	61.98	61.94	62.07	62.00
%Hydrogen	4.46	4.31	4.32	4.36
%Nitrogen	1.37	1.53	1.53	1.48
%Chlorine	0.04	0.00	0.00	0.01
%Sulfur	0.46	0.58	0.43	0.49
%Oxygen	11.23	12.36	11.33	11.64
%Ash	10.39	7.75	8.98	9.04
%Moisture	<u>10.11</u>	<u>11.53</u>	<u>11.34</u>	<u>10.99</u>
Total	100.04	100.00	100.00	100.01
Ult Analysis, MAF				
%Carbon	77.95	76.73	77.90	77.53
%Hydrogen	5.61	5.34	5.42	5.46
%Nitrogen	1.72	1.90	1.92	1.85
%Chlorine	0.05	0.00	0.00	0.02
%Sulfur	0.58	0.72	0.54	0.61
%Oxygen	14.12	15.31	14.22	14.55
Hardgrove Grind				
		42	44	43
%Moisture		2.84	2.38	2.61

Table 4-1 (continued)

PSCC ARAPAHOE UNIT 4 BASELINE COAL ANALYSIS

Test Number Date	2 11/11/91	21 11/19/91	35 12/4/91	Averages
Fusion Temp Reducing, °F				
Initial	2510	2412	2464	2462
Softening	2591	2475	2527	2531
Hemispherical	2640	2529	2574	2581
Fluid	2700	2624	2680	2668
Fusion Temp Oxidizing, °F				
Initial	2540	2507	2549	2532
Softening	2667	2567	2586	2607
Hemispherical	2700	2634	2654	2663
Fluid	2700	2700	2700	2700
Ash Analysis, %				
SiO ₂	59.29	52.34	56.99	56.21
Al ₂ O ₃	23.62	26.15	24.41	24.73
Fe ₂ O ₃	4.02	3.68	3.18	3.63
CaO	4.18	6.32	5.00	5.17
MgO	1.33	1.35	1.61	1.43
Na ₂ O	1.04	0.52	1.27	0.94
K ₂ O	1.01	0.71	1.00	0.91
TiO ₂	0.74	0.77	0.75	0.75
MnO ₂	0.07	0.07	0.07	0.07
P ₂ O ₅	0.72	1.64	0.97	1.11
SO ₃	2.95	4.63	3.23	3.60
StO*	0.24	0.41	0.28	0.31
BaO*	0.29	0.39	0.48	0.39
LiO				
Undetermined	0.50	1.02	0.76	0.76
Total	100.00	100.00	100.00	100.00
Base/Acid Ratio	0.1384	0.1587	0.1468	0.148
Silica Ratio	86.152	82.179	85.34	84.557
T _{zsc}	2900	2845	2900	2882
Fouling Index	1.04	0.52	1.27	0.94
Slagging Index	2548	2435	2502	2495