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Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

Report on

COMPLIANCE DEMONSTRATION
NO. 9 BATTERY COMBUSTION STACK

JUNE 1994

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Project No.: 3934-45-02

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EXECUTIVE SUMMARY

On May 11 and 12, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #9 Battery Combustion Stack. The purpose of the testing was to determine the (1) concentration and mass emission rate of particulate matter, and (2) presence and extent of visible emissions from the stack as required by the Amended Mon Valley Consent Decree, Paragraph V.A.(6) and Appendix 4.A.

The results of the testing showed an average particulate matter concentration and emission rate of 0.0152 grains per dry standard cubic feet (gr/dscf) and 4.72 pounds per hour (lb/hr), respectively. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the allowable particulate matter concentration for #9 Battery Combustion Stack is 0.030 gr/dscf. Thus, the average particulate matter concentration in the stack gas is less than the allowable concentration.

The opacity of the exhaust gas during any of the three tests was less than or equal to 10 percent. The average opacity of the exhaust gas in any 3 consecutive minute period was less than or equal to 5 percent. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the "visible emissions shall not equal or exceed 20 percent opacity for a period or periods aggregating in excess of 3 minutes in any 60-minute period and shall never equal or exceed 60 percent opacity."

1.0 INTRODUCTION

On May 11 and 12 1994, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #9 Battery Combustion Stack. The purpose of the testing was to determine the (1) concentration and mass emission rate of particulate matter, and (2) presence and extent of visible emissions from the stack as required by the Amended Mon Valley Consent Decree, Paragraph V.A.(6) and Appendix 4.A.

Testing was performed by Chester Environmental. All test procedures were witnessed by Phil Lawrence from the Allegheny County Health Department - Department of Air Quality (DAQ).

2.0 METHODOLOGIES

The compliance test program was conducted in accordance with the emissions measurement test protocol, which can be found in Appendix A.

Particulate matter sampling was performed in accordance with EPA Stationary Source Sampling Methods 1 through 5. Three two-hour tests were executed during normal, maximum operation and production of the battery.

The process exhausts through a 114 inch inside diameter stack. A total of 24 traverse points, 12 per diameter, were sampled; the traverse points were calculated in accordance with EPA Method 1. Sampling was conducted through four equally spaced ports, with six traverse points sampled per port. Each traverse point was sampled for 5 minutes, thus bringing the total sampling time to 120 minutes for each test run.

In accordance with EPA Method 2, velocities and volumetric flow rates of the exhaust gas were determined using a calibrated S type pitot tube. Positive and negative pitot lines were leak-checked at the beginning and end of each test run. Gas velocity differential pressures along with stack gas temperatures were recorded at each sampling point.

At the beginning and end of each test, gas concentrations of carbon dioxide (CO_2), oxygen (O_2), and nitrogen (N_2, by difference) were determined with the use of Fyrite apparatus as specified by EPA Method 3. Gas concentrations were used to obtain molecular weight of the process gas on a dry basis.

Percent moisture content, by volume, of the exhaust gas was determined by measuring the weight gain of the four sample train impingers in accordance with EPA Method 4.

As specified by EPA Method 5, each sample train was assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated such that isokinetic conditions were maintained. Clean up of the sampling train included an acetone rinse of the front-half components of the sample train. Front-half acetone rinses were evaporated to dryness, desiccated, and weighed to a constant weight. Sample train

filters were desiccated for 24 hours, and particulate matter weight was determined gravimetrically. Rinse residue weights and filter weights were measured to the nearest 0.1 mg. One acetone blank was prepared in the same manner as the test sample rinses. The blank residue weight was subtracted from the test sample residue weights. After blank correction, the acetone rinse residue weights and sample train filter weights were used to determine total particulate matter catch.

All visible emissions determinations were performed in accordance with EPA Stationary Source Sampling Method 9. Visible emission readings were recorded for the duration of each particulate matter test.

3.0 RESULTS

All testing was performed during periods of normal plant operation. The test results have been summarized in Table 1. The results of the testing showed an average particulate matter concentration and emission rate of 0.0152 grains per dry standard cubic feet (gr/dscf) and 4.72 pounds per hour (lb/hr), respectively. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the allowable particulate matter concentration for #9 Battery Combustion Stack is 0.030 gr/dscf. Thus, the average particulate matter concentration in the stack gas is less than the allowable concentration.

Table 1 also lists other pertinent stack and sampling parameters which include stack gas flow rate in units of actual cubic feet per minute (acfm), standard cubic feet per minute (scfm), and dry standard cubic feet per minute (dscfm), stack gas temperature (^{o}F), moisture content of the stack gas (percent by volume), gas volume sampled for each test in units of dry standard cubic feet (dscf), and the isokinetics value for each test. The gas volume sampled for each 120 minute test was greater than 50 dry standard cubic feet. The isokinetics value is equal to the ratio of the average linear gas velocity sampled through the probe nozzle to the average stack gas velocity. An isokinetics value between 90 percent and 110 percent is considered acceptable. Isokinetic values for the three test runs were 95.1 percent, 98.7 percent, and 106.4 percent; therefore, all values were within the acceptable range. Actual test sampling times have also been included in Table 1.

Copies of the field data sheets for the visible emissions readings can be found in Appendix A. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the "visible emissions shall not equal or exceed 20 percent opacity for a period or periods aggregating in excess of 3 minutes in any 60-minute period and shall never equal or exceed 60 percent opacity." The opacity of the exhaust gas during any of the three tests was less than or equal to 10 percent. The average opacity of the exhaust gas in any 3 consecutive minute period was less than or equal to 5 percent.

Copies of the field data sheets can be found in Appendix A. All sampling equipment was calibrated and operated in accordance with EPA Stationary Source Sampling Methods 1 through 5. Copies of the pre-test calibration results, post-test calibration results, and the

results of an audit conducted with a critical orifice provided by the Allegheny County Health Department DAQ can be found in Appendix A.

Copies of the plant operational data can be found in Appendix B. The gravimetric results and the emissions calculations for each test can be found in Appendix C.

USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 1

#9 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

		Run 1	Run 2	Run 3	Average
Test Number		CLR-BS#9-1	CLR-BS#9-2	CLR-BS#9-3	
Test Date		05-11-94	05-11-94	05-12-94	
Mass Emissions Rate and Concentration					
Particulate Matter	(lb/hr)	4.57	5.00	4.58	4.72
	(gr/dscf)	0.0142	0.0157	0.0157	0.0152
Stack Conditions					
Flow Rate	(acfm)	82700	82900	75800	80500
	(scfm)	43200	43100	39200	41800
	(dscfm)	37400	37200	33900	36200
Temperature	(°F)	533	537	540	537
Moisture Content	(%)	13.4	13.6	13.4	13.5
Sampling Conditions					
Test times		1040 to 1110	1320 to 1350	0818 to 0848	
		1114 to 1144	1353 to 1423	0852 to 0922	
		1147 to 1217	1426 to 1456	0925 to 0955	
		1220 to 1250	1500 to 1530	0958 to 1028	
Sampling Time	(minutes)	120	120	120	
Sample Volume	(dscf)	78.872	81.485	80.067	
Isokinetics	(%)	95.1	98.7	106.4	

COMPLIANCE DEMONSTRATION
NO. 9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX A

TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

CHESTER
ENVIRONMENTAL

TEST PROTOCOL
COMPLIANCE DEMONSTRATION
#9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PA

Particulate matter sampling will be performed in accordance with EPA Stationary Source Sampling Methods 1 through 5 (40 CFR, Part 60, Appendix A) and Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual. Three two-hour tests will be executed during normal operating conditions. Greater than 50 dry standard cubic feet of sample gas will be collected during each test run.

The process exhausts through a 114 inch diameter stack. A total of 24 traverse points (12 per diameter) will be sampled; the traverse points will be calculated in accordance with EPA Method 1. Sampling will be conducted through four equally spaced ports, with six traverse points sampled per port. Each point will be sampled for 5 minutes, thus bringing the total sampling time to 120 minutes.

In accordance with EPA Method 2, velocities and volumetric flow rates of the exhaust gas will be determined using a calibrated S type pitot tube. Positive and negative pitot lines will be leak-checked at the beginning and end of each test run. Gas velocity differential pressures along with stack gas temperatures will be recorded at each sampling point. Static pressure of the exhaust gas stream will be measured with the same pitot tube.

At the beginning and end of each test, gas concentrations of CO_2, O_2, and N_2 (by difference) will be determined with the use of Fyrite apparatus as specified by EPA Method 3. Gas concentrations will be used to obtain molecular weight of the process gas on a dry basis.

Percent moisture content, by volume, of the exhaust gas will determined by measuring the weight gain of the four sample train impingers in accordance with EPA Method 4.

As specified by EPA Method 5, each sample train will be assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated such that isokinetic conditions are maintained. Clean up of the sampling train will include an acetone rinse of the front-half components of the sample train. Front-half acetone rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. Sample train glass fiber filters will be desiccated for 24 hours, and particulate matter weight will be determined gravimetrically. Rinse residue weights and filter weights will be measured to the nearest 0.1 milligram. One acetone blank will be prepared in the same manner as the test sample rinses. The blank residue weight will be subtracted from the test sample residue weights. After blank correction, front-half acetone rinse residue weights and sample train filter weights will be used to determine total particulate matter catch. Clean up and analytical procedures will follow the methodology of EPA Method 5.

All visible emissions determinations will be performed in accordance with EPA Stationary Source Sampling Method 9. Visible emission readings will be recorded for the duration of each particulate matter test.

A report summarizing the compliance test program will be submitted within 60 days following completion of field work. The report will describe test methodologies utilized and present a textual and tabular summary of the emissions results and related sampling information. Copies of operational data will be included in the report to verify that all testing was performed during periods of normal plant operation. Also incorporated into the report will be copies of the pre-test calibration results, post-test calibration results, the results of an audit conducted with a critical orifice provided by the Allegheny County Health Department Bureau of Air Quality, field data sheets for the particulate matter sampling and visible emissions determinations, computer-generated emissions calculations, and analytical results for each test.

STACK SAMPLING DATA SHEET

CLIENT USS- CLAIRTON WORKS
TEST UNIT BATTERY STACK #9
PROJECT NO. 3934-45-02
TEST CREW RJC, MV
BAROMETRIC PRESSURE 29.45

TEST DATE 05-11-94 (WED)
TEST NO. USS-CLR-BS9-#1
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -.90" H_2O
PORT DIRECTION EAST, NORTH

ORIFICE CORRECTION (ΔH@) 1.814
METER CORRECTION (Y) 1.0128
CALIBRATION DATE 02-02-94
PITOT CORRECTION 0.84
CONTROL BOX NO. SIR

HOT/COLD BOX NO. 2
PROBE NO. 7-1
FILTER NO. 1228
STACK DIA. "
PORT SIZE 4" 4" EWSE

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
40.6	10:40	488.250	.05	1.46	1.46	75	73	2.0	536	~250°F	<68°F	~250°F	5 min./point
28.5			.07	2.05	2.05	86	72	3.0	542				
20.2			.06	1.75	1.75	90	75	3.0	550				
13.5			.08	2.34	2.34	99	76	3.5	555				
7.6			.06	1.75	1.75	103	78	3.0	524				
2.4	11:10	509.254	.03	0.88	0.88	105	80	3.0	520				
40.6	11:14	509.254	.04	1.17	1.17	93	82	3.5	534				
28.5			.04	1.17	1.17	95	82	3.5	530				
20.2			.08	2.34	2.34	101	83	4.5	564				
13.5			.07	2.05	2.05	107	84	4.0	528				
7.6			.06	1.75	1.75	109	85	3.5	525				
2.4	11:44	529.300	.03	0.88	0.88	110	87	3.0	521				

Estimates:
MW= 28.
%H2O= 10.

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.02 CFM
After	7.0	<0.02 CFM

PITOT LEAK CHECK

	Positive	Negative
Before	OK/15 sec	OK/15 sec
After	OK/15 sec	OK/15 sec

GAS	1	2
CO2	4.0	4.0
O2	12.5	12.5
CO	0	0
N2	83.5	83.5

12.55

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL DI H_2O	728.4	532.2	196.2
2.	100 mL DI H_2O	594.3	559.1	35.2
3.	EMPTY	443.9	438.3	5.6
4.	SILICA GEL	677.3	655.8	21.5
5.				
6.				
7.				
8.			total=	258.5g

237.0g

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON Works
TEST UNIT BATTERY STACK #9
PROJECT NO. 3934-45-02
TEST CREW RPC MV
BAROMETRIC PRESSURE 29.45

TEST DATE 05-11-94 (WED)
TEST NO. USS-CLR-BS9-#1
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -0.90" H_2O
PORT DIRECTION WEST, SOUTH

ORIFICE CORRECTION (ΔH@) 1.814
METER CORRECTION (Y) 1.0128
CALIBRATION DATE 02-02-94
PITOT CORRECTION 0.84
CONTROL BOX NO. SIX

HOT/COLD BOX NO. 2
PROBE NO. 7-1
FILTER NO. 1228
STACK DIA. 114"
PORT SIZE 4" Flange

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
40.6	1147	529.300	.09	2.63	2.63	95	87	3.5	523	~250°F	<68°F	~250°F	5 min./point
28.5			.07	2.05	2.05	107	86	3.0	557				
20.2			.07	2.05	2.05	108	87	3.0	520				
13.5			.06	1.75	1.75	110	87	3.0	534				
7.6			.05	1.46	1.46	111	87	2.5	541				
2.4	12:17	550.822	.03	.88	.88	110	88	2.0	520				
40.6	12:20	550.822	.08	2.34	2.34	101	89	3.5	538				
28.5			.06	1.75	1.75	109	88	3.0	529				
20.2			.06	1.75	1.75	110	88	3.0	520				
13.5			.04	1.17	1.17	110	89	2.0	525				
7.6			.05	1.46	1.46	109	89	2.5	532				
2.4	12:50	570.772	.03	.88	.88	110	89	2.0	537				
Test Totals	Δ=120 min	Δ=82.522 dcf	$(\Delta P)_{AVG}$ = .06	$(\Delta H)_{AVG}$ = 1.66		$(T_{meter})_{AVG}$ = 93°F			$(T_{stack})_{AVG}$ = 533°F				Estimates: MW= 28.8 %H2O= 10

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before		
After		

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS CLAIRTON WORKS
TEST UNIT BATTERY STACK #9
PROJECT NO. 3934-45-02
TEST CREW RPC, MV
BAROMETRIC PRESSURE 29.45

TEST DATE 05-11-94 (WED)
TEST NO. USS-CLR-BS 9-#2
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -0.90" H_2O
PORT DIRECTION SOUTH WEST

ORIFICE CORRECTION (ΔH@) 1.8914
METER CORRECTION (Y) 1.0128
CALIBRATION DATE 02-02-94
PITOT CORRECTION 0.84
CONTROL BOX NO. 5.X

HOT/COLD BOX NO. 3
PROBE NO. 7-1
FILTER NO. 1251
STACK DIA. 114"
PORT SIZE 4" FLANGE

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
406	13:20	571.050	.08	2.34	2.34	84	82	5.0	562	~250°F	<68°F	~250°F	5 min./point
285			.09	2.63	2.63	98	82	6.0	568				
202			.08	2.34	2.34	102	83	5.0	520				
135			.05	1.46	1.46	105	85	4.0	527				
76			.05	1.46	1.46	106	85	4.0	531				
24	13:50	593.595	.04	1.17	1.17	107	85	3.5	530				
406	13:53	593.595	.06	1.75	1.75	100	88	5.5	519				
285			.06	1.75	1.75	107	89	5.5	557				
202			.07	2.05	2.05	110	90	6.0	539				
135			.07	2.05	2.05	113	91	6.0	545				
76			.08	2.34	2.34	114	92	6.5	550				
24	14:23	615.500	.04	1.17	1.17	115	94	4.0	544				

Estimates:
MW= 28.8
%H2O= 12

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.02CFM
After	8.0	<0.02CFM

PITOT LEAK CHECK

	Positive	Negative
Before	OK/15sec	OK/15sec
After	OK/15sec	OK/15sec

GAS	1	2
CO2	4.0	4.0
O2	12.5	12.5
CO	0	0
N2	83.5	83.5

1440

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI H_2O	693.2	539.5	153.7
2.	100mL DI H_2O	634.5	571.2	63.3
3.	EMPTY	470.7	455.1	15.6
4.	SILICA GEL	668.5	630.8	37.7
5.				
6.			total=	270.3
7.				
8.				

232.

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS
TEST UNIT BATTERY STACK #9
PROJECT NO. 3934-95-02
TEST CREW RPC, MV
BAROMETRIC PRESSURE 29.45

TEST DATE 05-11-94 (WED)
TEST NO. USS-CLR-BS9-#2
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -.90" H2O
PORT DIRECTION NORTH EAST

ORIFICE CORRECTION (ΔH@) 1.814
METER CORRECTION (Y) 1.0128
CALIBRATION DATE 02-02-94
PITOT CORRECTION 0.84
CONTROL BOX NO. 5.K

HOT/COLD BOX NO. 3
PROBE NO. 7-1
FILTER NO. 1251
STACK DIA. 114"
PORT SIZE 4" flange

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
40.6	14:26	615.500	.08	2.34	2.34	109	95	6.0	509	~250°F	<68°F	~250°F	5 min./point
28.5			.09	2.63	2.63	114	95	7.0	524				
20.2			.05	1.46	1.46	114	95	4.0	530				
13.5			.06	1.75	1.75	115	95	5.0	537				
7.6			.05	1.46	1.46	116	95	4.5	540				
2.4	14:56	636.612	.03	.88	.88	116	96	3.5	530				
40.6	15:00	636.612	.08	2.34	2.34	105	95	6.5	513				
28.6			.06	1.75	1.75	115	95	5.5	540				
20.2			.06	1.75	1.75	117	97	5.5	549				
13.5			.05	1.46	1.46	117	97	4.0	554				
7.6			.06	1.75	1.75	117	97	5.5	550				
2.4	15:00	657.511	.03	0.88	0.88	118	98	2.5	529				
Test Totals	Δ=120 min	Δ=86.461 dcf	$(\Delta P)_{AVG}$ = .06	$(\Delta H)_{AVG}$ = 1.79		$(T_{meter})_{AVG}$ = 101°F			$(T_{stack})_{AVG}$ = 537°F				Estimates: MW= 28.8 %H2O= 12%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before		
After		

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS CLAIRTON WORKS
TEST UNIT BATTERY STACK #9
PROJECT NO. 3934-45-02
TEST CREW APC MV
BAROMETRIC PRESSURE 29.38

TEST DATE 05-12-94 (THUR.)
TEST NO. USS-CLR-B59-#3
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -.90" H2O
PORT DIRECTION EAST, NORTH

ORIFICE CORRECTION (ΔH@) 1.814
METER CORRECTION (Y) 1.0128
CALIBRATION DATE 02-02-94
PITOT CORRECTION 0.84
CONTROL BOX NO. SIX

HOT/COLD BOX NO. 2
PROBE NO. 7-1
FILTER NO. 1248
STACK DIA. 114"
PORT SIZE 4" Flange

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
406	08:18	657.940	.06	1.68	1.68	64	63	2.0	545	~250°F	<68°F	~250°F	5 min./point
285			.08	2.23	2.23	76	63	3.5	560				
202			.09	2.51	2.51	83	65	3.5	538				
135			.06	1.68	1.68	83	65	3.5	540				
76			.04	1.12	1.12	88	68	2.0	536				
24	08 48	679.465	.04	1.12	1.12	89	69	2.0	542				
406	08:52	679.465	.07	1.96	1.96	78	69	3.5	522				
285			.09	2.51	2.51	88	70	4.0	563				
202			.06	1.68	1.68	89	70	2.5	538				
135			.06	1.68	1.68	88	71	2.5	541				
76			.03	0.84	0.84	88	70	1.0	557				
24	09 22	699.635	.03	0.84	0.84	89	70	1.0	552				

Estimates:
MW= 28.8
%H2O= 12

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.02 cfm
After	6.0	<0.02 cfm

PITOT LEAK CHECK

	Positive	Negative
Before	OK/15 sec	OK/15 sec
After	OK/15 sec	OK/15 sec

GAS	1	2
CO2	4.5	4.5
O2	12.0	12.0
CO	0	0
N2	83.5	83.5

0/100

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL DI H2O	727.9	533.2	194.7
2.	100 mL DI H2O	635.4	594.3	41.1
3.	EMPTY	449.4	443.9	5.5
4.	SILICA GEL	672.8	652.5	20.30
5.				
6.				
7.				
8.			total =	261.6 g

241.3 g

13.3%

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS
TEST UNIT BATTERY STACK 9
PROJECT NO. 3934-45-02
TEST CREW RPC MV
BAROMETRIC PRESSURE 29.38

TEST DATE 05-12-94 (TUE)
TEST NO. US-CLR-BS9-3
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -.90"
PORT DIRECTION WEST SOUTH

ORIFICE CORRECTION (ΔH@) 1.814
METER CORRECTION (Y) 1.0128
CALIBRATION DATE 02-02-94
PITOT CORRECTION 0.84
CONTROL BOX NO. SIX

HOT/COLD BOX NO. 2
PROBE NO. 7-1
FILTER NO. 1248
STACK DIA. 114"
PORT SIZE 4" flange

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
406	09:25	699.635	.07	1.96	1.96	76	68	3.0	536	~250°F	<68	~250°F	5 min./point
285			.08	2.23	2.23	84	68	3.0	528				
202			.05	1.40	1.40	86	68	2.0	529				
135			.05	1.40	1.40	86	67	2.0	530				
76			.03	0.84	0.84	86	68	1.0	530				
24	09:55	719.848	.04	1.12	1.12	87	68	1.0	528				
406	09:58	719.848	.08	2.23	2.23	75	68	3.0	510				
285			.06	1.68	1.68	85	68	2.5	539				
202			.07	1.96	1.96	87	69	3.0	546				
135			.05	1.40	1.40	87	69	2.0	550				
76			.03	0.84	0.84	87	69	1.0	557				
24	10:28	739.348	.03	0.84	0.84	84	68	1.0	554				
Test Totals	Δ=120 min	Δ=81.408 dcf	$(\Delta P)_{Avg}$= .05	$(\Delta H)_{Avg}$= 1.57		$(T_{meter})_{Avg}$= 76°F			$(T_{stack})_{Avg}$= 540°F				

Estimates:
MW= 28.8
%H2O= 12

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before		
After		

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

CHESTER ENVIRONMENTAL

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 10:35

END TIME: 11:35

OBSERVATION POINT:
Parking lot outside main gate Maple st.

SOURCE:

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 17 mph

DIRECTION: SW

TEMPERATURE: 61°

SKY CONDITION: 25% Cloud Cover

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS:

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX-Clairton

OBSERVATION: START TIME: 11:35

END TIME: 12:35

OBSERVATION POINT:

Parking lot at Maple St gate

SOURCE: Batt. 9. Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 17

DIRECTION: SW

TEMPERATURE: 61

SKY CONDITION: 50% Clouds

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX-Clairton

OBSERVATION: START TIME: 12:35

END TIME: 1:35

OBSERVATION POINT: Parking Lot of Maplest gate

SOURCE: Batt. 9 stack

DISTANCE: 950'

DIRECTION FROM: SE

HEIGHT: 200'

WIND:

SPEED: 17mph

DIRECTION: SW

TEMPERATURE: 48

SKY CONDITION: Mostly Cloudy

BACKGROUND: sky

READING CONDITIONS: fair

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: FOREMAN:

COMMENTS:

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX-Clairton

OBSERVATION: START TIME: 1:35

END TIME: 2:35

OBSERVATION POINT: Maple St gate parking Lot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 17mph

DIRECTION: SW

TEMPERATURE: 69

SKY CONDITION: Mostly Cloudy

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-11-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 2:35

END TIME: 3:35

OBSERVATION POINT:
Maple St gate Parking Lot

SOURCE:

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 17mph

DIRECTION: SW

TEMPERATURE: 74

SKY CONDITION: Mostly Cloudy

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: Black

TOTAL No. OF READINGS: 236

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 10

CREW: ____ FOREMAN: ____

COMMENTS:

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	5
15	5	10	10	10
16	5	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56				
57				
58				
59				

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-12-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 8:00

END TIME: 9.00

OBSERVATION POINT:

Maple St gate parkinglot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 14 mph

DIRECTION: NW

TEMPERATURE: 53°F

SKY CONDITION: Mostly Cloudy

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-12-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 9:00

END TIME: 10:00

OBSERVATION POINT:

Maplest gate parking lot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 14 mph

DIRECTION: NW

TEMPERATURE: 50

SKY CONDITION: Overcast

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: ✓

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-12-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 10:00

END TIME: 11:00

OBSERVATION POINT: Maplest. gate parking lot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 14 mph

DIRECTION: N

TEMPERATURE: 49

SKY CONDITION: Overcast

BACKGROUND: Sky

READING CONDITIONS: fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

9 STACK

OBSERVER: Mark Zaleski

DATE: 5-12-94

FACILITY: USX Clairton

OBSERVATION: START TIME: 11:00

END TIME: 1130

OBSERVATION POINT:

Maple St. gate parking lot

SOURCE: Batt. 9 Stack

DISTANCE: 950'

DIRECTION FROM: S

HEIGHT: 200'

WIND:

SPEED: 14mph

DIRECTION: N

TEMPERATURE: 50

SKY CONDITION: Overcast

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: Black

TOTAL No. OF READINGS: 120

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 10

CREW: ____ FOREMAN: ____

COMMENTS:

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	5	5	5
24	5	5	5	10
25	10	10	5	5
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

30				
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CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 6 BP 29 in. Hg
DATE 02-02-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER						
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	METER COEFFICIENT Y	ORIFICE COEFFICIENT ΔH@
START			0.000	29.00					265.100		
HALF		69.0			90.0	76.0	83.0	0.50			
STOP	12.90		5.000						270.200		
CALCULATION	12.90	529.0	5.013	29.00							
START			0.000	29.00					5.100		
HALF		69.0					543.0	29.04		1.0076	1.866
STOP	9.00		5.000		96.0	82.0	89.0	1.00	270.500		
CALCULATION	9.00	529.0	5.013	29.00					275.602		
START			0.000	29.00					5.102		
HALF		69.0					549.0	29.07		1.0170	1.796
STOP	6.33		5.000		96.0	81.0	88.5	2.00	276.100		
CALCULATION	6.33	529.0	5.013	29.00					281.200		
AVERAGE							548.5	29.15	5.100	1.0139	1.779
										1.0128	1.814

POST TEST

BOX # 6 BP 29.00 in. Hg
DATE 06-09-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT	ORIFICE COEFFICIENT
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	Y	ΔH@
START			0.000	29.00				1.70	135.300		
HALF		78.0			112.0	96.0	104.0				
STOP	6.95		5.000						140.394		
CALCULATION	6.95	538.0	5.013	29.00			564.0	29.13	5.094	1.0271	1.833
START			0.000	29.00				1.70	140.900		
HALF		78.0			116.0	97.0	106.5				
STOP	7.00		5.000						146.000		
CALCULATION	7.00	538.0	5.013	29.00			566.5	29.13	5.100	1.0305	1.852
START			0.000	29.00				1.70	146.700		
HALF		78.0			117.0	97.0	107.0				
STOP	7.00		5.000						151.809		
CALCULATION	7.00	538.0	5.013	29.00			567.0	29.13	5.109	1.0296	1.850
AVERAGE										1.0291	1.845
DIFFERENCE										-1.6%	-1.7%

PRE-TEST MAGNEHELIC CALIBRATION
BOX# 6
DATE 02-02-94
OPERATOR RPC

0 to 3.0" H2O RANGE

MAGNEHELIC

Δ P	MANOMETER
0.50	0.50
1.00	1.00
2.00	2.00
3.00	3.00

0 to 0.50" H2O RANGE
SLANT TUBE
PRIMARY STANDARD

0 to 5" H2O RANGE

MAGNEHELIC

Δ H	MANOMETER
4.00	4.00
3.00	3.00
2.00	2.00
1.00	1.00
0.50	0.50

PRE-TEST LEAK CHECK
DATE 02-02-94
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	264.400	264.560	0.160	10.000	-0.001
WET	0.000	0.150	0.150		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

VOLTAGE INPUT (mV)	ARGE TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	301.0
8.31	400	400.0
10.57	500	500.0

PRE-TEST PYROMETER CHECK
DATE 02-02-94
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	300.0
8.31	400	400.0
10.57	500	500.0

POST-TEST MAGNEHELIC CALIBRATION
BOX# 6
DATE 06-09-94
OPERATOR RPC

0 to 3.0" H2O RANGE

MAGNEHELIC

Δ P	MANOMETER
0.50	0.50
1.00	1.00
2.00	2.00
3.00	3.00

0 to 0.50" H2O RANGE
SLANT TUBE
PRIMARY STANDARD

0 to 5" H2O RANGE

MAGNEHELIC

Δ H	MANOMETER
4.00	4.00
3.00	3.00
2.00	2.00
1.00	1.00
0.50	0.50

POST-TEST LEAK CHECK
DATE 06-09-94
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	134.261	134.471	0.210	10.000	-0.0000
WET	0.000	0.210	0.210		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

VOLTAGE INPUT (mV)	ARGE TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	301.0
8.31	400	400.0
10.57	500	500.0

POST-TEST PYROMETER CHECK
DATE 06-09-94
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	301.0
8.31	400	402.0
10.57	500	502.0

QA ORIFICE AUDIT

ORIFICE	BAPC-3	DATE	06-09-94	B.P.	29.00
OPERATOR	RPC	BOX #	6		

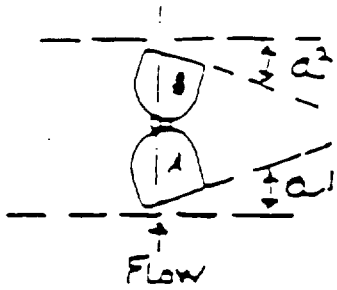
RUN	1		2		3	
INITIAL CF	110.300		118.300		126.300	
FINAL CF	117.825		125.828		133.810	
DIFFERENCE	7.525		7.528		7.510	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	105	100	102	98	102	97
TEMP 5 MIN	102	99	101	97	102	97
TEMP 10 MIN	102	98	102	97	103	98
TEMP 15 MIN	102	98	102	97	103	98
		TEMP R		TEMP R		TEMP R
TEMP AVG	100.75	560.75	99.5	559.5	100	560
TIME (MIN.)	15.00		15.00		15.00	
	N WATE	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.75	0.06	0.75	0.06	0.75	0.06
METER PRESSURE		29.06		29.06		29.06
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	78.0	25.6	78.0	25.6	78.0	25.6
VACUUM IN HG	21.0		21.0		21.0	
DGM CAL Y	1.0128		1.0128		1.0128	
STD CF	6.995		7.014		6.991	
STD CUBIC METERS	0.1981		0.1986		0.1980	

GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check

Probe #: 7-1
Date: 1-24-94
Initials: [illegible]

①

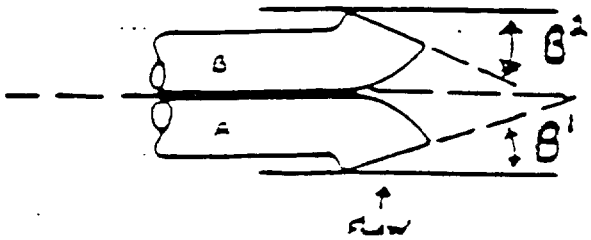


a^1 = 1.0°
a^2 = 4.0°
a^1, a^2 = <10°

B^1 = 1.0°
B^2 = 1.0°
B^1, B^2 = <5°

F = 1.042"

②



μ = .008 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0.0262 — V = ≤0.03125" (V = F TAN θ)

W = 1.160 — W ≥ 0"

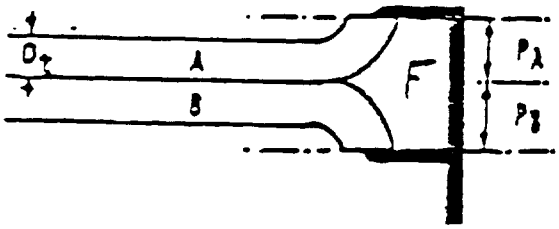
X = 1.491 — X ≥ 0.750" (3/4" using 1/2" nozzle)

Y = 6.000 — Y ≥ 3.0"

Z = 2.551 — Z > 2.0"

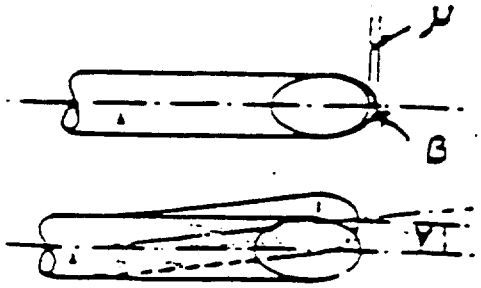
D_t = .374 — D_t > .1875"

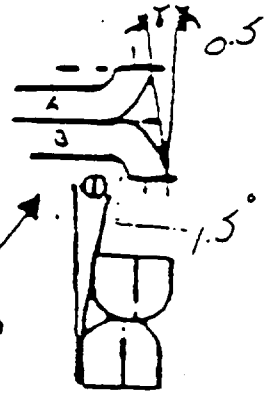
③



1.05 D_t < A < 1.50 D_t
P_A = P_B
2.10 D_t < A < 3.00 D_t

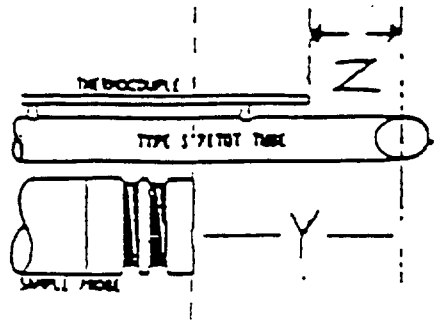
④



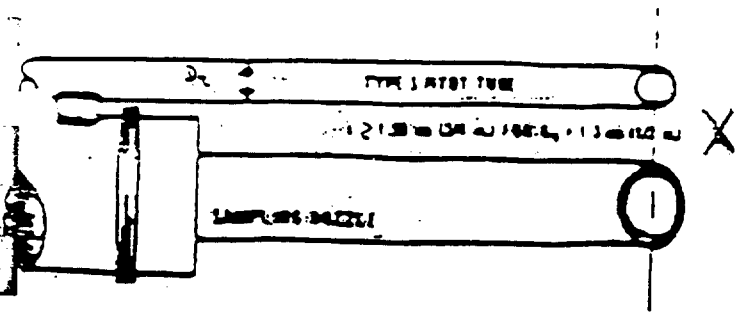


(γ, θ EXPRESSED IN DEGREES)

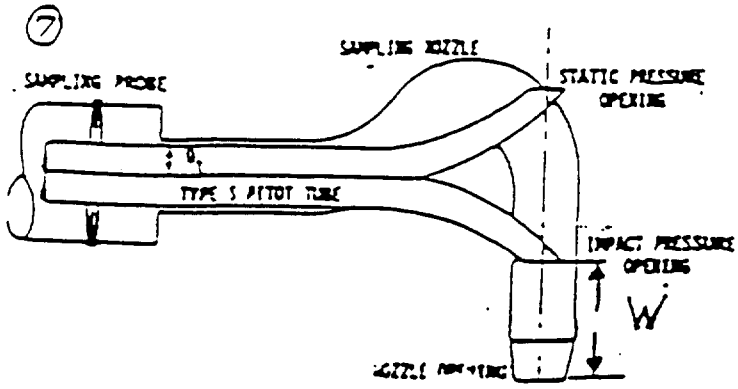
⑥



⑤



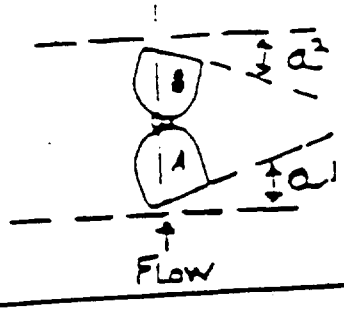
⑦



GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check

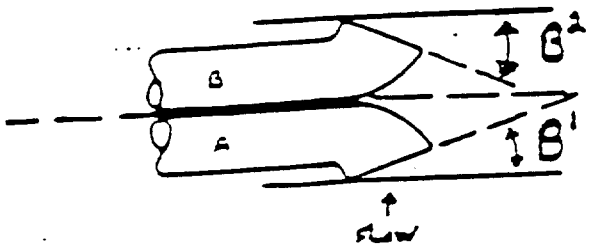
Probe #: 7-1
Date: 06-10-94
Initials: RPC



a^1 = 1°
a^2 = 2°
$a^1, a^2 = <10°$

B^1 = 1°
B^2 = 1°
$B^1, B^2, = <5°$

F = 1.50"

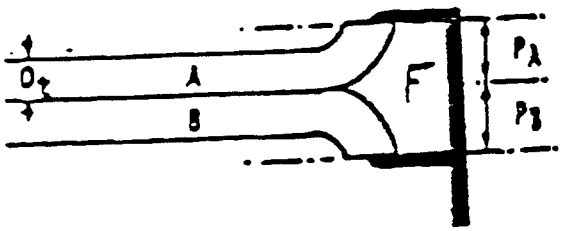


μ = 0 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0 — V = ≤0.03125" (V = F TAN θ)

W = .25 — W ≥ 0"

X = .850 — X ≥ 0.750" (3/4" using 1/2" nozzle)

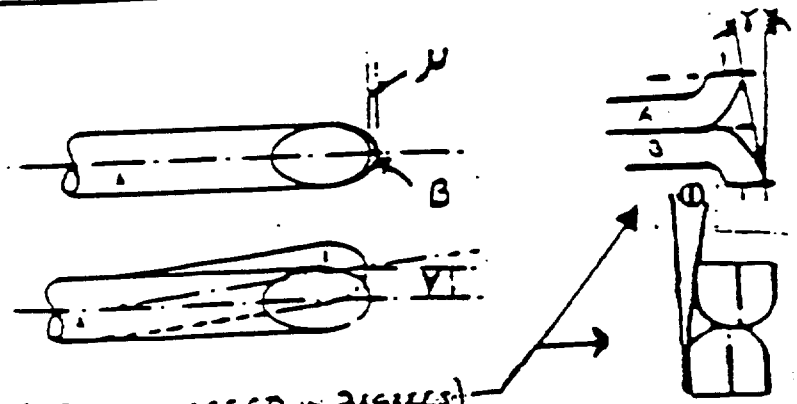


1.05 D_t < A < 1.50 D_t
$P_A = P_B$
2.10 D_t < A < 3.00 D_t

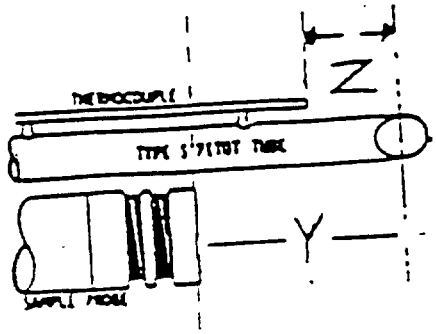
Y = 6.10 — Y ≥ 3.0"

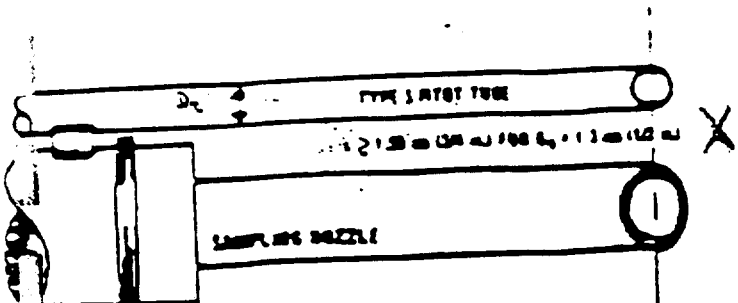
Z = 2.6 — Z > 2.0"

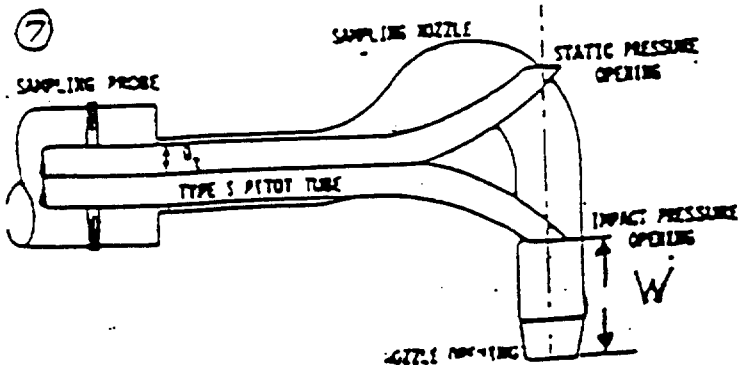
D_t = .390 — D_t > .1875"



(γ, θ EXPRESSED IN DEGREES)







COMPLIANCE DEMONSTRATION
NO. 9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX B

PLANT OPERATIONAL DATA

CHESTER
ENVIRONMENTAL

Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
A20/8	18:39	11:49pm	12:00am	12:11am
B21/7	18:44	11:55pm	12:05am	12:15am
B20/7	18:44	12:00am	12:11am	12:22am
A22/8	18:44	12:05am	12:17am	12:28am
B22/7	18:44	12:11am	12:23am	12:35am
A24/8	18:44	12:15am	12:29am	12:43am
B24/7	18:44	12:18am	12:33am	12:47am
A26/8	18:43	12:24am	12:38am	12:52am
B26/7	18:44	12:27am	12:40am	12:53am
A28/8	18:44	12:33am	12:45am	12:57am
B29/7	18:44	12:41am	12:52am	1:03am
A30/8	18:44	12:47am	12:58am	1:09am
B30/7	18:44	12:53am	1:04am	1:15am
A1 /9	18:44	12:59am	1:10am	1:21am
B1 /8	18:43	1:05am	1:16am	1:27am
A3 /9	18:44	1:10am	1:21am	1:32am
B3 /8	18:44	1:16am	1:27am	1:38am
A5 /9	18:44	1:22am	1:33am	1:44am
B5 /8	18:44	1:28am	1:39am	1:50am
A7 /9	18:44	1:34am	1:45am	1:56am
B7 /8	18:44	1:40am	1:51am	2:02am
A9 /9	18:43	1:46am	1:57am	2:08am
B9 /8	18:44	1:51am	2:02am	2:13am
A11/9	18:44	1:57am	2:08am	2:19am
B11/8	18:44	2:03am	2:14am	2:25am
A13/9	18:44	2:09am	2:20am	2:31am
B13/8	18:44	2:15am	2:26am	2:37am
A15/9	18:44	2:21am	2:32am	2:43am
B15/8	18:43	2:27am	2:38am	2:49am
A17/9	18:43	2:32am	2:43am	2:54am
B17/8	18:43	2:38am	2:49am	3:00am
A19/9	18:43	2:44am	2:55am	3:06am
B19/8	18:43	2:50am	3:01am	3:12am
A21/9	18:43	2:56am	3:07am	3:18am
B21/8	18:43	3:02am	3:13am	3:24am
A23/9	18:43	3:08am	3:19am	3:30am
B23/8	18:43	3:13am	3:24am	3:35am
A25/9	18:43	3:19am	3:30am	3:41am
B25/8	18:43	3:25am	3:36am	3:47am
A27/9	18:43	3:31am	3:42am	3:53am
B27/8	18:43	3:37am	3:48am	3:59am
A29/9	18:43	3:43am	3:54am	4:05am
B29/8	18:41	3:48am	3:59am	4:10am
A31/9	18:41	3:54am	4:05am	4:16am
B31/8	18:41	4:00am	4:11am	4:22am
C2 /8	18:41	4:06am	4:17am	4:28am
B2 /9	18:41	4:12am	4:23am	4:34am
A1 /7	18:41	4:18am	4:29am	4:40am
B4 /9	18:40	4:24am	4:35am	4:45am
A4 /7	18:40	4:29am	4:40am	4:51am
B6 /9	18:40	4:35am	4:46am	4:57am
A6 /7	18:40	4:41am	4:52am	5:03am
B8 /9	18:40	4:47am	4:58am	5:09am
A8 /7	18:40	4:53am	5:04am	5:15am
B10/9	18:40	4:59am	5:10am	5:21am
A10/7	18:39	5:05am	5:16am	5:27am
B12/9	18:39	5:10am	5:21am	5:32am
A12/7	18:39	5:16am	5:27am	5:38am
B14/9	18:39	5:22am	5:33am	5:44am
A14/7	18:39	5:28am	5:39am	5:50am
B16/9	18:39	5:34am	5:45am	5:56am
A16/7	18:39	5:40am	5:51am	6:02am
B18/9	18:39	5:46am	5:57am	6:03am
A18/7	18:39	5:51am	6:02am	6:13am
B20/9	18:38	5:57am	6:08am	6:19am
A22/7	18:38	6:03am	6:14am	6:25am
B22/9	18:38	6:09am	6:20am	6:31am
A24/7	18:38	6:15am	6:26am	6:37am
B24/9	18:38	6:21am	6:32am	6:43am
A26/7	18:38	6:27am	6:38am	6:49am
B26/9	18:37	6:33am	6:43am	6:54am
A28/7	18:37	6:39am	6:49am	7:00am
B28/9	18:37	6:44am	6:55am	7:05am
A30/7	18:37	6:50am	7:01am	7:12am
B30/9	18:37	6:56am	7:07am	7:18am
A32/7	18:37	7:02am	7:13am	7:24am
B32/9	18:36	7:08am	7:19am	7:30am
A1 /8	18:36	7:14am	7:25am	7:36am
B1 /9	18:36	7:19am	7:30am	7:41am
A3 /8	18:36	7:25am	7:36am	7:47am
B3 /9	18:36	7:31am	7:42am	7:53am

+B 31/7 wA 20/8

PUSHING SCHEDULE

Wednesday, May 11, 1994 Turn 1

Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
[illegible]	18:36	7:37am	7:48am	7:59am
B5 /8	18:36	7:43am	7:54am	8:05am

Batteries: 7-8 2

Oven	Last Pushed	Earliest	Desired	Latest
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
A23/7	18:44	3:49pm	4:00pm	4:11pm
B25/9	18:44	3:55pm	4:05pm	4:16pm
A25/7	18:44	4:00pm	4:11pm	4:22pm
B27/9	18:44	4:06pm	4:17pm	4:28pm
A27/7	18:44	4:12pm	4:23pm	4:34pm
B29/9	18:44	4:18pm	4:29pm	4:40pm
A29/7	18:44	4:24pm	4:35pm	4:46pm
B31/9	18:44	4:29pm	4:40pm	4:51pm
A31/7	18:44	4:35pm	4:46pm	4:57pm
C2 /9	18:44	4:41pm	4:52pm	5:03pm
A2 /8	18:44	4:47pm	4:58pm	5:09pm
B2 /7	18:44	4:53pm	5:04pm	5:15pm
A4 /6	18:44	4:59pm	5:10pm	5:21pm
B4 /7	18:44	5:05pm	5:16pm	5:27pm
A6 /6	18:44	5:10pm	5:22pm	5:32pm
B6 /7	18:44	5:16pm	5:27pm	5:38pm
A8 /8	18:44	5:22pm	5:33pm	5:44pm
B8 /7	18:44	5:28pm	5:39pm	5:50pm
A10/6	18:44	5:34pm	5:45pm	5:56pm
B10/7	18:44	5:40pm	5:51pm	6:02pm
A12/6	18:44	5:46pm	5:57pm	6:08pm
B12/7	18:44	5:51pm	6:02pm	6:13pm
A14/8	18:44	5:57pm	6:08pm	6:19pm
B14/7	18:44	6:03pm	6:14pm	6:25pm
A16/8	18:44	6:09pm	6:20pm	6:31pm
B16/7	18:44	6:15pm	6:26pm	6:37pm
A18/6	18:44	6:21pm	6:32pm	6:43pm
B18/7	18:44	6:27pm	6:38pm	6:49pm
A20/6	18:44	6:32pm	6:43pm	6:54pm
B20/7	18:44	6:38pm	6:49pm	7:00pm
A22/6	18:36	6:44pm	6:55pm	7:06pm
B22/7	18:36	6:50pm	7:01pm	7:12pm
A24/8	18:36	6:56pm	7:07pm	7:18pm
B24/7	18:36	7:02pm	7:13pm	7:24pm
A26/9	18:36	7:08pm	7:19pm	7:30pm
B26/7	18:39	7:13pm	7:24pm	7:35pm
A28/6	18:38	7:19pm	7:30pm	7:41pm
B28/7	18:36	7:25pm	7:36pm	7:47pm
A30/6	18:38	7:31pm	7:42pm	7:53pm
B30/7	18:36	7:37pm	7:48pm	7:59pm
A1 /9	18:39	7:43pm	7:54pm	8:05pm
B1 /8	18:38	7:48pm	7:59pm	8:10pm
A3 /9	18:38	7:54pm	8:05pm	8:16pm
B3 /8	18:38	8:00pm	8:11pm	8:22pm
A5 /9	18:38	8:06pm	8:17pm	8:28pm
B5 /8	18:38	8:12pm	8:23pm	8:34pm
A7 /9	18:36	8:18pm	8:29pm	8:40pm
B7 /8	18:38	8:24pm	8:35pm	8:46pm
A9 /9	18:36	8:29pm	8:40pm	8:51pm
B9 /8	18:38	8:35pm	8:46pm	8:57pm
A11/8	18:38	8:41pm	8:52pm	9:03pm
B11/8	18:38	8:47pm	8:58pm	9:09pm
A13/8	18:38	8:53pm	9:04pm	9:15pm
B13/8	18:35	8:59pm	9:10pm	9:21pm
A15/8	18:38	9:05pm	9:16pm	9:27pm
B15/8	18:38	9:10pm	9:21pm	9:32pm
A17/9	18:38	9:16pm	9:27pm	9:38pm
B17/8	18:38	9:22pm	9:33pm	9:44pm
A19/9	18:38	9:28pm	9:39pm	9:50pm
B19/8	18:38	9:34pm	9:45pm	9:56pm
A21/8	18:38	9:40pm	9:51pm	10:02pm
B21/8	18:38	9:46pm	9:57pm	10:08pm
A23/6	18:38	9:51pm	10:02pm	10:13pm
B23/8	18:38	9:57pm	10:08pm	10:19pm
A25/8	18:38	10:03pm	10:14pm	10:25pm
B25/8	18:38	10:09pm	10:20pm	10:31pm
A27/8	18:38	10:15pm	10:26pm	10:37pm
B27/8	18:38	10:21pm	10:32pm	10:43pm
A29/8	18:38	10:27pm	10:38pm	10:49pm
B29/8	18:38	10:32pm	10:43pm	10:54pm
A31/8	18:38	10:38pm	10:49pm	11:00pm
B31/8	18:38	10:44pm	10:55pm	11:06pm
C2 /9	18:38	10:50pm	11:01pm	11:12pm
A2 /8	18:38	10:56pm	11:07pm	11:18pm
B2 /8	18:38	11:02pm	11:13pm	11:24pm
A4 /8	18:38	11:08pm	11:19pm	11:30pm
B4 /8	18:38	11:14pm	11:25pm	11:36pm
A6 /8	18:38	11:20pm	11:31pm	11:42pm
B6 /8	18:38	11:26pm	11:37pm	11:48pm
A8 /8	18:38	11:32pm	11:43pm	11:54pm
B8 /8	18:38	11:38pm	11:49pm	12:00am
A10/8	18:38	11:44pm	11:55pm	12:06am
B10/8	18:38	11:50pm	12:01am	12:12am
A12/8	18:38	11:56pm	12:07am	12:18am
B12/8	18:38	12:02am	12:13am	12:24am
A14/8	18:38	12:08am	12:19am	12:30am
B14/8	18:38	12:14am	12:25am	12:36am
A16/8	18:38	12:20am	12:31am	12:42am
B16/8	18:38	12:26am	12:37am	12:48am
A18/8	18:38	12:32am	12:43am	12:54am
B18/8	18:38	12:38am	12:49am	1:00am
A20/8	18:38	12:44am	12:55am	1:06am
B20/8	18:38	12:50am	1:01am	1:12am
A22/8	18:38	12:56am	1:07am	1:18am
B22/8	18:38	1:02am	1:13am	1:24am
A24/8	18:38	1:08am	1:19am	1:30am
B24/8	18:38	1:14am	1:25am	1:36am
A26/8	18:38	1:20am	1:31am	1:42am
B26/8	18:38	1:26am	1:37am	1:48am
A28/8	18:38	1:32am	1:43am	1:54am
B28/8	18:38	1:38am	1:49am	2:00am
A30/8	18:38	1:44am	1:55am	2:06am
B30/8	18:38	1:50am	2:01am	2:12am

PUSHING SCHEDULE

Wednesday, May 11, 1994 Turn 3

Batteries: 7-9_2

Last Pushed	Earliest	Desired	Latest
18:38	11:37am	11:48am	11:59am
18:38	11:43am	11:54am	12:05pm

Oven	Last Pushed	Earliest	Desired	Latest
A22/7	18:39	11:49am	12:22am	12:11am
A22/8	18:44	12:15am	12:05am	12:16am
A23/9	18:44	12:22am	12:11am	12:23am
A23/8	18:44	12:30am	12:17am	12:28am
A24/7	18:44	12:36am	12:23am	12:34am
A24/8	18:44	12:42am	12:30am	12:42am
A24/9	18:44	12:48am	12:36am	12:46am
A25/8	18:45	12:54am	12:41am	12:52am
A25/9	18:45	1:00am	12:47am	12:58am
A22/7	18:45	1:06am	12:53am	1:04am
A22/8	18:45	1:12am	12:59am	1:10am
A22/9	18:45	1:18am	1:05am	1:16am
A23/7	18:45	1:24am	1:11am	1:22am
A23/8	18:45	1:30am	1:17am	1:28am
A23/9	18:45	1:36am	1:23am	1:35am
A24/7	18:45	1:42am	1:29am	1:39am
A24/8	18:45	1:48am	1:35am	1:45am
A24/9	18:45	1:54am	1:41am	1:51am
A25/7	18:45	2:00am	1:47am	1:57am
A25/8	18:45	2:06am	1:53am	2:03am
A25/9	18:45	2:12am	1:59am	2:07am
A30/7	18:45	2:18am	2:05am	2:15am
A30/8	18:45	2:24am	2:11am	2:21am
A30/9	18:46	2:30am	2:17am	2:27am
A31/7	18:46	2:36am	2:23am	2:33am
A31/8	18:46	2:42am	2:29am	2:39am
A31/9	18:46	2:48am	2:35am	2:45am
A32/7	18:46	2:54am	2:41am	2:50am
A32/8	18:46	3:00am	2:47am	2:56am
A32/9	18:46	3:06am	2:53am	3:02am
A33/7	18:46	3:12am	2:59am	3:08am
A33/8	18:46	3:18am	3:05am	3:14am
A33/9	18:46	3:24am	3:11am	3:20am
A34/7	18:46	3:30am	3:17am	3:26am
A34/8	18:46	3:36am	3:23am	3:32am
A34/9	18:46	3:42am	3:29am	3:38am
A35/7	18:46	3:48am	3:35am	3:44am
A35/8	18:46	3:54am	3:41am	3:50am
A35/9	18:46	4:00am	3:47am	3:56am
A36/7	18:46	4:06am	3:53am	4:02am
A36/8	18:46	4:12am	3:59am	4:08am
A36/9	18:46	4:18am	4:05am	4:13am
A37/7	18:46	4:24am	4:11am	4:19am
A37/8	18:46	4:30am	4:17am	4:25am
A37/9	18:46	4:36am	4:23am	4:31am
A38/7	18:46	4:42am	4:29am	4:37am
A38/8	18:46	4:48am	4:35am	4:43am
A38/9	18:46	4:54am	4:41am	4:49am
A39/7	18:46	5:00am	4:47am	4:55am
A39/8	18:46	5:06am	4:53am	5:01am
A39/9	18:46	5:12am	4:59am	5:07am
A40/7	18:46	5:18am	5:05am	5:13am
A40/8	18:46	5:24am	5:11am	5:19am
A40/9	18:46	5:30am	5:17am	5:25am
A41/7	18:46	5:36am	5:23am	5:30am
A41/8	18:46	5:42am	5:29am	5:36am
A41/9	18:46	5:48am	5:35am	5:42am
A42/7	18:46	5:54am	5:41am	5:48am
A42/8	18:46	6:00am	5:47am	5:54am
A42/9	18:46	6:06am	5:53am	6:00am
A43/7	18:46	6:12am	5:59am	6:06am
A43/8	18:46	6:18am	6:05am	6:12am
A43/9	18:46	6:24am	6:11am	6:18am
A44/7	18:46	6:30am	6:17am	6:24am
A44/8	18:46	6:36am	6:23am	6:30am
A44/9	18:46	6:42am	6:29am	6:36am
A45/7	18:46	6:48am	6:35am	6:42am
A45/8	18:46	6:54am	6:41am	6:48am
A45/9	18:46	7:00am	6:47am	6:54am
A46/7	18:46	7:06am	6:53am	7:00am
A46/8	18:46	7:12am	6:59am	7:06am
A46/9	18:46	7:18am	7:05am	7:12am
A47/7	18:46	7:24am	7:11am	7:18am
A47/8	18:46	7:30am	7:17am	7:24am
A47/9	18:46	7:36am	7:23am	7:30am
A48/7	18:46	7:42am	7:29am	7:36am
A48/8	18:46	7:48am	7:35am	7:42am
A48/9	18:46	7:54am	7:41am	7:48am
A49/7	18:46	8:00am	7:47am	7:54am
A49/8	18:46	8:06am	7:53am	8:00am
A49/9	18:46	8:12am	7:59am	8:06am
A50/7	18:46	8:18am	8:05am	8:12am
A50/8	18:46	8:24am	8:11am	8:18am
A50/9	18:46	8:30am	8:17am	8:24am
A51/7	18:46	8:36am	8:23am	8:30am
A51/8	18:46	8:42am	8:29am	8:36am
A51/9	18:46	8:48am	8:35am	8:42am
A52/7	18:46	8:54am	8:41am	8:48am
A52/8	18:46	9:00am	8:47am	8:54am
A52/9	18:46	9:06am	8:53am	9:00am
A53/7	18:46	9:12am	8:59am	9:06am
A53/8	18:46	9:18am	9:05am	9:12am
A53/9	18:46	9:24am	9:11am	9:18am
A54/7	18:46	9:30am	9:17am	9:24am
A54/8	18:46	9:36am	9:23am	9:30am
A54/9	18:46	9:42am	9:29am	9:36am
A55/7	18:46	9:48am	9:35am	9:42am
A55/8	18:46	9:54am	9:41am	9:48am
A55/9	18:46	10:00am	9:47am	9:54am
A56/7	18:46	10:06am	9:53am	10:00am
A56/8	18:46	10:12am	9:59am	10:06am
A56/9	18:46	10:18am	10:05am	10:12am
A57/7	18:46	10:24am	10:11am	10:18am
A57/8	18:46	10:30am	10:17am	10:24am
A57/9	18:46	10:36am	10:23am	10:30am
A58/7	18:46	10:42am	10:29am	10:36am
A58/8	18:46	10:48am	10:35am	10:42am
A58/9	18:46	10:54am	10:41am	10:48am
A59/7	18:46	11:00am	10:47am	10:54am
A59/8	18:46	11:06am	10:53am	11:00am
A59/9	18:46	11:12am	10:59am	11:06am
A60/7	18:46	11:18am	11:05am	11:12am
A60/8	18:46	11:24am	11:11am	11:18am
A60/9	18:46	11:30am	11:17am	11:24am
A61/7	18:46	11:36am	11:23am	11:30am
A61/8	18:46	11:42am	11:29am	11:36am
A61/9	18:46	11:48am	11:35am	11:42am
A62/7	18:46	11:54am	11:41am	11:48am
A62/8	18:46	12:00pm	11:47am	11:54am
A62/9	18:46	12:06pm	11:53am	12:00pm
A63/7	18:46	12:12pm	11:59am	12:06pm
A63/8	18:46	12:18pm	12:05pm	12:12pm
A63/9	18:46	12:24pm	12:11pm	12:18pm
A64/7	18:46	12:30pm	12:17pm	12:24pm
A64/8	18:46	12:36pm	12:23pm	12:30pm
A64/9	18:46	12:42pm	12:29pm	12:36pm
A65/7	18:46	12:48pm	12:35pm	12:42pm
A65/8	18:46	12:54pm	12:41pm	12:48pm
A65/9	18:46	1:00pm	12:47pm	12:54pm
A66/7	18:46	1:06pm	12:53pm	1:00pm
A66/8	18:46	1:12pm	12:59pm	1:06pm
A66/9	18:46	1:18pm	1:05pm	1:12pm
A67/7	18:46	1:24pm	1:11pm	1:18pm
A67/8	18:46	1:30pm	1:17pm	1:24pm
A67/9	18:46	1:36pm	1:23pm	1:30pm
A68/7	18:46	1:42pm	1:29pm	1:36pm
A68/8	18:46	1:48pm	1:35pm	1:42pm
A68/9	18:46	1:54pm	1:41pm	1:48pm
A69/7	18:46	2:00pm	1:47pm	1:54pm
A69/8	18:46	2:06pm	1:53pm	2:00pm
A69/9	18:46	2:12pm	1:59pm	2:06pm
A70/7	18:46	2:18pm	2:05pm	2:12pm
A70/8	18:46	2:24pm	2:11pm	2:18pm
A70/9	18:46	2:30pm	2:17pm	2:24pm
A71/7	18:46	2:36pm	2:23pm	2:30pm
A71/8	18:46	2:42pm	2:29pm	2:36pm
A71/9	18:46	2:48pm	2:35pm	2:42pm
A72/7	18:46	2:54pm	2:41pm	2:48pm
A72/8	18:46	3:00pm	2:47pm	2:54pm
A72/9	18:46	3:06pm	2:53pm	3:00pm
A73/7	18:46	3:12pm	2:59pm	3:06pm
A73/8	18:46	3:18pm	3:05pm	3:12pm
A73/9	18:46	3:24pm	3:11pm	3:18pm
A74/7	18:46	3:30pm	3:17pm	3:24pm
A74/8	18:46	3:36pm	3:23pm	3:30pm
A74/9	18:46	3:42pm	3:29pm	3:36pm
A75/7	18:46	3:48pm	3:35pm	3:42pm
A75/8	18:46	3:54pm	3:41pm	3:48pm
A75/9	18:46	4:00pm	3:47pm	3:54pm
A76/7	18:46	4:06pm	3:53pm	4:00pm
A76/8	18:46	4:12pm	3:59pm	4:06pm
A76/9	18:46	4:18pm	4:05pm	4:12pm
A77/7	18:46	4:24pm	4:11pm	4:18pm
A77/8	18:46	4:30pm	4:17pm	4:24pm
A77/9	18:46	4:36pm	4:23pm	4:30pm
A78/7	18:46	4:42pm	4:29pm	4:36pm
A78/8	18:46	4:48pm	4:35pm	4:42pm
A78/9	18:46	4:54pm	4:41pm	4:48pm
A79/7	18:46	5:00pm	4:47pm	4:54pm
A79/8	18:46	5:06pm	4:53pm	5:00pm
A79/9	18:46	5:12pm	4:59pm	5:06pm
A80/7	18:46	5:18pm	5:05pm	5:12pm
A80/8	18:46	5:24pm	5:11pm	5:18pm
A80/9	18:46	5:30pm	5:17pm	5:24pm
A81/7	18:46	5:36pm	5:23pm	5:30pm
A81/8	18:46	5:42pm	5:29pm	5:36pm
A81/9	18:46	5:48pm	5:35pm	5:42pm
A82/7	18:46	5:54pm	5:41pm	5:48pm
A82/8	18:46	6:00pm	5:47pm	5:54pm
A82/9	18:46	6:06pm	5:53pm	6:00pm
A83/7	18:46	6:12pm	5:59pm	6:06pm
A83/8	18:46	6:18pm	6:05pm	6:12pm
A83/9	18:46	6:24pm	6:11pm	6:18pm
A84/7	18:46	6:30pm	6:17pm	6:24pm
A84/8	18:46	6:36pm	6:23pm	6:30pm
A84/9	18:46	6:42pm	6:29pm	6:36pm
A85/7	18:46	6:48pm	6:35pm	6:42pm
A85/8	18:46	6:54pm	6:41pm	6:48pm
A85/9	18:46	7:00pm	6:47pm	6:54pm
A86/7	18:46	7:06pm	6:53pm	7:00pm
A86/8	18:46	7:12pm	6:59pm	7:06pm
A86/9	18:46	7:18pm	7:05pm	7:12pm
A87/7	18:46	7:24pm	7:11pm	7:18pm
A87/8	18:46	7:30pm	7:17pm	7:24pm
A87/9	18:46	7:36pm	7:23pm	7:30pm
A88/7	18:46	7:42pm	7:29pm	7:36pm
A88/8	18:46	7:48pm	7:35pm	7:42pm
A88/9	18:46	7:54pm	7:41pm	7:48pm
A89/7	18:46	8:00pm	7:47pm	7:54pm
A89/8	18:46	8:06pm	7:53pm	8:00pm
A89/9	18:46	8:12pm	7:59pm	8:06pm

$-B\frac{31}{7} - B\frac{4}{8}$

$+B\frac{31}{7}\ \omega A\frac{10}{7}$

P U S H I N G S C H E D U L E

Thursday, May 12, 1994 Turn 1

Batteries: 7-9 2

Last Pushed	Earliest	Desired	Latest
18:42	7:43am	7:54am	8:05am

#	Oven	Last Pushed	Earliest	Desired	Latest
	A30/9	16:36	7:45am	8:00am	8:15am
	B30/9	16:36	7:51am	8:06am	8:21am
	C1 /8	16:36	7:57am	8:12am	8:27am
	B1 /9	16:36	8:03am	8:18am	8:33am
	A1 /7	16:36	8:27am	8:42am	8:57am
	B3 /9	16:35	8:15am	8:24am	8:33am
	A3 /7	16:36	8:21am	8:30am	8:39am
	B5 /9	16:36	8:51am	8:36am	8:45am
	A5 /7	16:35	8:27am	8:42am	8:51am
	B7 /9	16:36	8:33am	8:48am	8:57am
	A7 /7	16:36	8:39am	8:54am	9:03am
	B9 /9	16:36	8:45am	9:00am	9:15am
	A9 /7	16:36	8:51am	9:06am	9:21am
	B11/9	16:36	8:57am	9:12am	9:27am
	A11/7	16:36	9:03am	9:18am	9:33am
	B13/9	16:36	9:09am	9:24am	9:39am
	A13/7	16:36	9:15am	9:30am	9:45am
	B15/9	16:36	9:21am	9:36am	9:51am
	A15/7	16:36	9:27am	9:42am	9:57am
	B17/9	16:36	9:33am	9:48am	10:03am
	A17/7	16:36	9:39am	9:54am	10:09am
	B19/9	16:36	9:45am	10:00am	10:15am
	A19/7	16:36	9:51am	10:06am	10:21am
	B21/9	16:36	9:57am	10:12am	10:27am
	A21/7	16:36	10:03am	10:18am	10:33am
	B23/9	16:36	10:09am	10:24am	10:39am
	A23/7	16:36	10:15am	10:30am	10:45am
	B25/9	16:37	10:21am	10:36am	10:51am
	A25/7	16:37	10:27am	10:42am	10:57am
	B27/9	16:37	10:33am	10:48am	11:03am
	A27/7	16:37	10:39am	10:54am	11:09am
	B29/9	16:37	10:45am	11:00am	11:15am
	A29/7	16:37	10:51am	11:06am	11:21am
	B31/9	16:38	10:57am	11:12am	11:27am
	A31/7	16:38	11:03am	11:18am	11:33am
	C2 /9	16:38	11:09am	11:24am	11:39am
	A2 /8	16:38	11:15am	11:30am	11:45am
	B2 /7	16:38	11:21am	11:36am	11:51am
	A4 /8	16:38	11:27am	11:42am	11:57am
	B4 /7	16:38	11:33am	11:48am	12:03pm
	A6 /9	16:38	11:39am	11:54am	12:09pm
	B6 /7	16:39	11:45am	12:00pm	12:15pm
	A8 /8	16:39	11:51am	12:06pm	12:21pm
	B8 /7	16:39	11:57am	12:12pm	12:27pm
	A10/8	16:39	12:03pm	12:18pm	12:33pm
	B10/7	16:39	12:09pm	12:24pm	12:39pm
	A12/8	16:39	12:15pm	12:30pm	12:45pm
	B12/7	16:39	12:21pm	12:36pm	12:51pm
	A14/8	16:40	12:27pm	12:42pm	12:57pm
	B14/7	16:40	12:33pm	12:48pm	1:03pm
	A16/8	16:40	12:39pm	12:54pm	1:09pm
	B16/7	16:40	12:45pm	1:00pm	1:15pm
	A18/8	16:40	12:51pm	1:06pm	1:21pm
	B18/7	16:40	12:57pm	1:12pm	1:27pm
	A20/8	16:41	1:03pm	1:18pm	1:33pm
	B20/7	16:41	1:09pm	1:24pm	1:39pm
	A22/8	16:41	1:15pm	1:30pm	1:45pm
	B22/7	16:41	1:21pm	1:36pm	1:51pm
	A24/8	16:41	1:27pm	1:42pm	1:57pm
	B24/7	16:41	1:33pm	1:48pm	2:03pm
	A26/8	16:41	1:39pm	1:54pm	2:09pm
	B26/7	16:42	1:45pm	2:00pm	2:15pm
	A28/8	16:42	1:51pm	2:06pm	2:21pm
	B28/7	16:42	1:57pm	2:12pm	2:27pm
	A30/8	16:42	2:03pm	2:18pm	2:33pm
	B30/7	16:42	2:09pm	2:24pm	2:39pm
	A1 /9	16:42	2:15pm	2:30pm	2:45pm
	B1 /8	16:42	2:21pm	2:36pm	2:51pm
	A3 /9	16:43	2:27pm	2:42pm	2:57pm
	B3 /8	16:43	2:33pm	2:48pm	3:03pm
	A5 /9	16:43	2:39pm	2:54pm	3:09pm
	B5 /8	16:43	2:45pm	3:00pm	3:15pm
	A7 /9	16:43	2:51pm	3:06pm	3:21pm
	B7 /8	16:43	2:57pm	3:12pm	3:27pm
	A9 /9	16:43	3:03pm	3:18pm	3:33pm
	B9 /8	16:43	3:09pm	3:24pm	3:39pm
	A11/9	16:43	3:15pm	3:30pm	3:45pm
	B11/8	16:43	3:21pm	3:36pm	3:51pm
	A13/9	16:43	3:27pm	3:42pm	3:57pm
	B13/8	16:43	3:33pm	3:48pm	4:03pm
	A15/9	16:43	3:39pm	3:54pm	4:09pm
	B15/8	16:43	3:45pm	4:00pm	4:15pm
	A17/9	16:43	3:51pm	4:06pm	4:21pm
	B17/8	16:43	3:57pm	4:12pm	4:27pm
	A19/9	16:43	4:03pm	4:18pm	4:33pm
	B19/8	16:43	4:09pm	4:24pm	4:39pm
	A21/9	16:43	4:15pm	4:30pm	4:45pm
	B21/8	16:43	4:21pm	4:36pm	4:51pm
	A23/9	16:43	4:27pm	4:42pm	4:57pm
	B23/8	16:43	4:33pm	4:48pm	5:03pm
	A25/9	16:43	4:39pm	4:54pm	5:09pm
	B25/8	16:43	4:45pm	5:00pm	5:15pm
	A27/9	16:43	4:51pm	5:06pm	5:21pm
	B27/8	16:43	4:57pm	5:12pm	5:27pm
	A29/9	16:43	5:03pm	5:18pm	5:33pm
	B29/8	16:43	5:09pm	5:24pm	5:39pm
	A31/9	16:43	5:15pm	5:30pm	5:45pm
	B31/8	16:43	5:21pm	5:36pm	5:51pm
	C2 /9	16:43	5:27pm	5:42pm	5:57pm
	A2 /8	16:43	5:33pm	5:48pm	6:03pm
	B2 /7	16:43	5:39pm	5:54pm	6:09pm
	A4 /8	16:43	5:45pm	6:00pm	6:15pm
	B4 /7	16:43	5:51pm	6:06pm	6:21pm
	A6 /9	16:43	5:57pm	6:12pm	6:27pm
	B6 /7	16:43	6:03pm	6:18pm	6:33pm
	A8 /8	16:43	6:09pm	6:24pm	6:39pm
	B8 /7	16:43	6:15pm	6:30pm	6:45pm
	A10/8	16:43	6:21pm	6:36pm	6:51pm
	B10/7	16:43	6:27pm	6:42pm	6:57pm
	A12/8	16:43	6:33pm	6:48pm	7:03pm
	B12/7	16:43	6:39pm	6:54pm	7:09pm
	A14/8	16:43	6:45pm	7:00pm	7:15pm
	B14/7	16:43	6:51pm	7:06pm	7:21pm
	A16/8	16:43	6:57pm	7:12pm	7:27pm
	B16/7	16:43	7:03pm	7:18pm	7:33pm
	A18/8	16:43	7:09pm	7:24pm	7:39pm
	B18/7	16:43	7:15pm	7:30pm	7:45pm
	A20/8	16:43	7:21pm	7:36pm	7:51pm
	B20/7	16:43	7:27pm	7:42pm	7:57pm
	A22/8	16:43	7:33pm	7:48pm	8:03pm
	B22/7	16:43	7:39pm	7:54pm	8:09pm
	A24/8	16:43	7:45pm	8:00pm	8:15pm
	B24/7	16:43	7:51pm	8:06pm	8:21pm
	A26/8	16:43	7:57pm	8:12pm	8:27pm
	B26/7	16:43	8:03pm	8:18pm	8:33pm
	A28/8	16:43	8:09pm	8:24pm	8:39pm
	B28/7	16:43	8:15pm	8:30pm	8:45pm
	A30/8	16:43	8:21pm	8:36pm	8:51pm
	B30/7	16:43	8:27pm	8:42pm	8:57pm
	A1 /9	16:43	8:33pm	8:48pm	9:03pm
	B1 /8	16:43	8:39pm	8:54pm	9:09pm
	A3 /9	16:43	8:45pm	9:00pm	9:15pm
	B3 /8	16:43	8:51pm	9:06pm	9:21pm
	A5 /9	16:43	8:57pm	9:12pm	9:27pm
	B5 /8	16:43	9:03pm	9:18pm	9:33pm
	A7 /9	16:43	9:09pm	9:24pm	9:39pm
	B7 /8	16:43	9:15pm	9:30pm	9:45pm
	A9 /9	16:43	9:21pm	9:36pm	9:51pm
	B9 /8	16:43	9:27pm	9:42pm	9:57pm
	A11/9	16:43	9:33pm	9:48pm	10:03pm
	B11/8	16:43	9:39pm	9:54pm	10:09pm
	A13/9	16:43	9:45pm	10:00pm	10:15pm
	B13/8	16:43	9:51pm	10:06pm	10:21pm
	A15/9	16:43	9:57pm	10:12pm	10:27pm
	B15/8	16:43	10:03pm	10:18pm	10:33pm
	A17/9	16:43	10:09pm	10:24pm	10:39pm
	B17/8	16:43	10:15pm	10:30pm	10:45pm
	A19/9	16:43	10:21pm	10:36pm	10:51pm
	B19/8	16:43	10:27pm	10:42pm	10:57pm
	A21/9	16:43	10:33pm	10:48pm	11:03pm
	B21/8	16:43	10:39pm	10:54pm	11:09pm
	A23/9	16:43	10:45pm	11:00pm	11:15pm
	B23/8	16:43	10:51pm	11:06pm	11:21pm
	A25/9	16:43	10:57pm	11:12pm	11:27pm
	B25/8	16:43	11:03pm	11:18pm	11:33pm
	A27/9	16:43	11:09pm	11:24pm	11:39pm
	B27/8	16:43	11:15pm	11:30pm	11:45pm
	A29/9	16:43	11:21pm	11:36pm	11:51pm
	B29/8	16:43	11:27pm	11:42pm	11:57pm
	A31/9	16:43	11:33pm	11:48pm	12:03am
	B31/8	16:43	11:39pm	11:54pm	12:09am
	C2 /9	16:43	11:45pm	12:00am	12:15am
	A2 /8	16:43	11:51pm	12:06am	12:21am
	B2 /7	16:43	11:57pm	12:12am	12:27am
	A4 /8	16:43	12:03am	12:18am	12:33am
	B4 /7	16:43	12:09am	12:24am	12:39am
	A6 /9	16:43	12:15am	12:30am	12:45am
	B6 /7	16:43	12:21am	12:36am	12:51am
	A8 /8	16:43	12:27am	12:42am	12:57am
	B8 /7	16:43	12:33am	12:48am	1:03am
	A10/8	16:43	12:39am	12:54am	1:09am
	B10/7	16:43	12:45am	1:00am	1:15am
	A12/8	16:43	12:51am	1:06am	1:21am
	B12/7	16:43	12:57am	1:12am	1:27am
	A14/8	16:43	1:03am	1:18am	1:33am
	B14/7	16:43	1:09am	1:24am	1:39am
	A16/8	16:43	1:15am	1:30am	1:45am
	B16/7	16:43	1:21am	1:36am	1:51am
	A18/8	16:43	1:27am	1:42am	1:57am
	B18/7	16:43	1:33am	1:48am	2:03am
	A20/8	16:43	1:39am	1:54am	2:09am
	B20/7	16:43	1:45am	2:00am	2:15am
	A22/8	16:43	1:51am	2:06am	2:21am
	B22/7	16:43	1:57am	2:12am	2:27am
	A24/8	16:43	2:03am	2:18am	2:33am
	B24/7	16:43	2:09am	2:24am	2:39am
	A26/8	16:43	2:15am	2:30am	2:45am
	B26/7	16:43	2:21am	2:36am	2:51am
	A28/8	16:43	2:27am	2:42am	2:57am
	B28/7	16:43	2:33am	2:48am	3:03am
	A30/8	16:43	2:39am	2:54am	3:09am
	B30/7	16:43	2:45am	3:00am	3:15am
	A1 /9	16:43	2:51am	3:06am	3:21am
	B1 /8	16:43	2:57am	3:12am	3:27am
	A3 /9	16:43	3:03am	3:18am	3:33am
	B3 /8	16:43	3:09am	3:24am	3:39am
	A5 /9	16:43	3:15am	3:30am	3:45am
	B5 /8	16:43	3:21am	3:36am	3:51am
	A7 /9	16:43	3:27am	3:42am	3:57am
	B7 /8	16:43	3:33am	3:48am	4:03am
	A9 /9	16:43	3:39am	3:54am	4:09am

Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
A15/9	18:44	3:49pm	4:00pm	4:11pm
B15/8	18:44	3:55pm	4:05pm	4:15pm
A17/9	18:44	4:00pm	4:11pm	4:22pm
B17/8	18:44	4:05pm	4:17pm	4:28pm
A19/9	19:44	4:11pm	4:22pm	4:34pm
B19/8	18:44	4:18pm	4:29pm	4:40pm
A21/9	18:44	4:24pm	4:35pm	4:46pm
B21/8	18:43	4:29pm	4:42pm	4:51pm
A23/9	18:44	4:35pm	4:46pm	4:57pm
B23/8	18:44	4:41pm	4:52pm	5:03pm
A25/9	18:44	4:47pm	4:58pm	5:09pm
B25/8	18:44	4:53pm	5:04pm	5:15pm
A27/9	18:44	4:59pm	5:10pm	5:21pm
B27/8	18:44	5:05pm	5:16pm	5:27pm
A29/9	18:47	5:10pm	5:21pm	5:32pm
B29/8	18:44	5:15pm	5:27pm	5:38pm
A31/9	18:44	5:22pm	5:33pm	5:44pm
B31/8	18:44	5:28pm	5:39pm	5:50pm
[illegible]	18:44	5:34pm	5:45pm	5:56pm
[illegible]	18:44	5:42pm	5:51pm	6:02pm
[illegible]	18:44	5:46pm	5:57pm	6:06pm
B4 /9	18:43	5:51pm	6:02pm	6:13pm
A4 /7	18:24	5:57pm	6:03pm	6:19pm
B6 /9	18:44	6:03pm	6:14pm	6:25pm
[illegible]	18:44	6:09pm	6:20pm	6:31pm
[illegible]	18:44	6:15pm	6:26pm	6:37pm
A8 /7	18:44	6:21pm	6:32pm	6:43pm
B10/9	18:44	6:27pm	6:38pm	6:49pm
A10/7	18:43	6:32pm	6:43pm	6:54pm
B12/9	18:38	6:38pm	6:49pm	7:00pm
A12/7	18:38	6:44pm	6:55pm	7:06pm
B14/9	18:38	6:50pm	7:01pm	7:12pm
A14/7	18:38	6:56pm	7:07pm	7:18pm
B16/9	18:38	7:02pm	7:13pm	7:24pm
A16/7	18:38	7:08pm	7:19pm	7:30pm
B18/9	18:37	7:13pm	7:24pm	7:35pm
A18/7	18:37	7:19pm	7:30pm	7:41pm
B20/9	18:37	7:25pm	7:36pm	7:47pm
A20/7	18:37	7:31pm	7:42pm	7:53pm
B22/9	18:37	7:37pm	7:48pm	7:59pm
A22/7	18:37	7:43pm	7:54pm	8:05pm
B24/9	18:37	7:48pm	7:59pm	8:10pm
A24/7	18:37	7:54pm	8:05pm	8:16pm
B26/9	18:37	8:00pm	8:11pm	8:22pm
A26/7	18:37	8:06pm	8:17pm	8:28pm
B28/9	18:37	8:12pm	8:23pm	8:34pm
A28/7	18:37	8:18pm	8:29pm	8:40pm
B30/9	18:37	8:24pm	8:35pm	8:46pm
[illegible]	18:36	8:29pm	8:40pm	8:51pm
A32/7	18:36	8:35pm	8:46pm	8:57pm
[illegible]	18:36	8:41pm	8:52pm	9:03pm
[illegible]	18:36	8:47pm	8:58pm	9:09pm
[illegible]	18:36	8:53pm	9:04pm	9:15pm
[illegible]	18:36	8:59pm	9:10pm	9:21pm
[illegible]	18:36	9:05pm	9:16pm	9:27pm
[illegible]	18:36	9:12pm	9:23pm	9:33pm
[illegible]	18:36	9:18pm	9:29pm	9:39pm
[illegible]	18:36	9:22pm	9:33pm	9:44pm
[illegible]	18:36	9:28pm	9:39pm	9:50pm
[illegible]	18:36	9:34pm	9:45pm	9:56pm
A11/8	18:36	9:40pm	9:51pm	10:02pm
[illegible]	18:36	9:46pm	9:57pm	10:08pm
[illegible]	18:36	9:51pm	10:02pm	10:13pm
[illegible]	18:36	9:57pm	10:08pm	10:19pm
A15/8	18:36	10:03pm	10:14pm	10:25pm
B15/7	18:36	10:07pm	10:20pm	10:31pm
A17/8	18:36	10:15pm	10:26pm	10:37pm
B17/7	18:36	10:21pm	10:32pm	10:43pm
A19/8	18:36	10:27pm	10:38pm	10:49pm
B19/7	18:36	10:32pm	10:43pm	10:54pm
A21/8	18:36	10:38pm	10:49pm	11:00pm
[illegible]	18:36	10:44pm	10:55pm	11:06pm
[illegible]	18:36	10:50pm	11:01pm	11:12pm
[illegible]	18:36	10:56pm	11:07pm	11:18pm
[illegible]	18:36	11:02pm	11:13pm	11:24pm
[illegible]	18:36	11:08pm	11:19pm	11:30pm
[illegible]	18:34	11:13pm	11:24pm	11:35pm
[illegible]	18:34	11:19pm	11:30pm	11:41pm
[illegible]	18:34	11:25pm	11:36pm	11:47pm
[illegible]	18:34	11:31pm	11:42pm	11:53pm

7/-B31

PUSHING SCHEDULE

Thursday, May 12, 1994 Turn 3
Batteries: 7-9_2

Oven	Last Pushed	Earliest	Desired	Latest
[illegible]1/9	18:34	11:37pm	11:48pm	11:59pm
[illegible] /9	18:42	11:43pm	11:54pm	12:05am

CC-10295 REV. 1181
93.003.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 5

12 Hrs. Beginning 12:00 AM

Date 5-11-94

BATTERY NO. 9 As

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	1	13	1	35	
3	1	27	1	46	
5	1	37	1	57	
7	1	48	2	08	
9	1	59	2	19	
11	2	10	2	28	
13	2	21	2	40	
15	2	30	2	52	
17	2	42	3	04	
19	2	54	3	16	
21	3	06	3	28	
23	3	18	3	40	
25	3	30	3	52	
27	3	42	4	04	
29	3	54	4	22	
31	4	06	4	34	
2	10	41	11	07	
4	10	52	11	20	
6	11	09	11	33	
8	11	22	11	43	
10	11	35	11	54	PB
12	11	45			
14	11	56			
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					

BATTERY NO. 9 Bs

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
19					
21					
23					
25					
27					
29					
31					
2	4	24	4	46	
4	4	36	4	58	
6	4	48	5	10	
8	5	—	5	22	
10	5	12	5	34	
12	5	24	5	46	
14	5	36	5	58	
16	5	48	6	10	
18	6	—	6	22	
20	6	12	6	34	PB
22	6	24	6	46	
24	6	36	6	58	
26	6	48	7	10	
28	7	—	7	16	
30	7	12	7	28	
C1	7	18	7	40	
2					

BATTERY NO. 8 As

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	7	30	7	52	
3	7	42	8	16	
5	7	54	8	27	
7	8	18	8	38	
9	8	29	8	49	
11	8	40	9	01	
13	8	51	9	11	
15	9	03	9	22	
17	9	13	9	32	
19	9	24	9	43	
21	9	34	9	53	
23	9	45	10	04	
25	9	55	10	18	
27	10	06	10	28	
29	10	20	10	39	
31	10	30	10	50	
2					
4					
6					
8					
10					
12					
14					
16			12	09	
18			12	19	
20	12	11	12	29	
22	12	21	12	39	
24	12	31	12	49	
26	12	41	1	--	
28	12	51	1	11	
30	1	02	1	25	
1					
2					

REMARKS: 23 / 21 / 16 / 10 / 22 / 24

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	5		6-7	5	5	
1-2	6	6		7-8	6	5	
2-3	5	5		8-9	4	4	
3-4	5	5		9-10	6	6	
4-5	4	5		10-11	5	5	
5-6	5	5		11-12	5	5	
	30	31			31	30	

Total Ovens Pushed 61

Total Ovens Charged 61

Pusherman

Battery Foreman

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 3

12 Hrs. Beginning 12:00 P.M.

Date 05-11-94

BATTERY NO. A-9

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	7 26	7 34	
3	7 37	7 45	
5	7 48	7 56	
7	7 59	8 08	
9	8 11	8 18	
11	8 22	8 29	
13	8 35	8 42	
15	8 45	8 52	
17	8 56	9 03	
19	9 10	9 18	
21	9 22	9 30	
23	9 34	9 41	
25	9 45	9 52	
27	9 55	9 59	
29	10 02	10 06	
31	10 08	10 14	
2			
4			
6			
8			
10			
12		12 05	
14		12 16	
16	12 07	12 29	
18	12 18	12 37	
20	12 29	12 47	
22	12 39	12 58	
24	12 49	1 08	
26	1 00	1 18	
28	1 10	1 28	
30	1 20	1 39	
1			
2			

REMARKS: 24/26

BATTERY NO. B-9

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	1 37	1 57	
3	1 48	2 07	
5	1 59	2 18	
7	2 09	2 28	
9	2 20	2 39	
11	2 30	2 49	
13	2 41	2 59	
15	2 51	3 09	
17	3 02	3 19	
19	3 12	3 28	
21	3 21	3 38	
23	3 31	3 48	
25	4 08	4 17	
27	4 20	4 27	
29	4 30	4 38	
31	4 42	4 49	
2	10 40	10 47	
4	10 50	10 57	
6	11 02	11 10	
8	11 13	11 21	
10	11 25	11 32	
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
1			
2	4 52	4 59	

22/22

BATTERY NO. A-8

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1			
3			
5			
7			
9			
11			
13			
15			
17			
19			
21			
23			
25			
27			
29			
31			
2	4 57	5 03	
4	5 06	5 13	
6	5 16	5 24	
8	5 27	5 34	
10	5 37	5 45	
12	5 47	5 53	
14	5 56	5 59	
16	6 05	6 10	
18	6 15	6 21	
20	6 25	6 32	
22	6 35	6 42	
24	6 45	6 53	
26	6 55	7 02	
28	7 05	7 13	
30	7 16	7 23	
1			
2			

15/15

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	6		6-7	6	5	
1-2	6	5		7-8	6	6	
2-3	5	6		8-9	5	5	
3-4	4	5		9-10	5	6	
4-5	6	5		10-11	4	4	
5-6	6	7		11-12	3	3	
	32	34			29	29	

Total Ovens Pushed

Total Ovens Charged

Pusherman

Battery Foreman

CC-10255 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 3
12 Hrs. Beginning 12:00 AM
Date 5-12-94

BATTERY NO. AS-9

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
19					
21					
23					
25					
27					
29					
31					
2	5	22	5	38	
4	5	35	5	49	
6	5	40	5	59	
8	5	51	6	10	
10	6	01	6	20	
12	6	12	6	28	
14	6	22	6	35	
16	6	32	6	46	
18	6	43	6	57	
20	6	54	7	09	
22	7	06	7	21	
24	7	18	7	33	
26	7	30	7	39	
28	7	42	7	45	PB
30	8	16	8	25	
1					
2					

BATTERY NO. BS-9

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	8	33	8	45	
3	8	48	8	55	
5	8	59	9	15	
7	9	10	9	30	
9	9	21	9	40	
11	9	33	9	53	
13	9	51	10	05	
15	9	56	10	17	
17	10	03	10	28	
19	10	19	10	42	
21	10	30	10	52	
23	10	44	11	05	
25	10	54	11	15	
27	11	10	11	22	
29	11	20	11	32	
31	11	30	11	39	
2					
4					
6					
8					
10					
12	12	10	12	19	
14	12	15	12	25	
16	12	21	12	31	
18	12	27	12	37	
20	12	33	12	52	
22	12	39	1	02	
24	1	20	1	28	
26	1	25	1	36	
28	1	31	1	44	
30	1	47	1	54	
C1	2	27	2	46	
C3	11	41	11	45	

BATTERY NO. AS-8

OVEN NO	TIME PUSHED		TIME CHARGED		NOTES
1	2	37	2	56	
3	2	48	3	06	
5	2	58	3	16	
7	3	08	3	24	
9	3	18	3	36	
11	3	28	3	48	
13	3	38	3	59	
15	3	50	4	11	
17	4	01	4	21	
19	4	13	4	31	
21	4	23	4	41	
23	4	33	4	52	
25	4	43	4	57	
27	4	54	5	07	
29	4	57	5	20	
31	5	09	5	33	
2	11	47	11	56	
4	11	58			
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					

REMARKS: 15/15 28/28 18/17
Need 2 New Chair

Condition of Signals OK

Condition of Pusher ok

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	6	5		6-7	6	6	
1-2	4	5		7-8	4	5	
2-3	4	2		8-9	4	3	
3-4	5	6		9-10	5	4	
4-5	7	6		10-11	5	5	
5-6	5	6		11-12	6	7	
	31	30			30	30	

Total Ovens Pushed 61
Total Ovens Charged 60

Pusherman 20481
Battery Foreman

CC-10255 REV. 1161
03.031.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 3

12 Hrs. Beginning 12:00 N Noon

Date 5-12-94

BATTERY NO. 9 As

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	2	43	2	52	
3	2	54	3	05	
5	3	07	3	15	
7	3	17	3	25	
9	3	27	3	35	
11	3	37	3	45	
13	3	47	3	50	
15	4	05	4	12	
17	4	17	4	24	
19	4	27	4	35	
21	4	40	4	48	
23	4	51	4	59	
25	5	03	5	11	
27	5	09	5	18	
29	5	27	5	34	
31	5	38	5	45	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					

REMARKS: 16/16

BATTERY NO. 9 Bs

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
19					
21					
23					
25					
27					
29					
31					
2	5	53	5	59	
4	6	04	6	12	
6	6	18	6	24	
8	6	28	6	36	
10	6	38	6	45	
12	6	48	6	54	
14	6	58	7	05	
16	7	07	7	14	
18	7	17	7	24	
20	7	27	7	33	
22	7	37	7	43	
24	7	48	7	54	
26	7	59	8	05	
28	8	09	8	16	
30	8	20	8	24	
C1	8	27	8	32	
2					

16/16

BATTERY NO. 8 Bs

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	8	40	8	46	
3	8	51	8	58	
5	9	02	9	08	
7	9	12	9	15	
9	9	17	9	24	
11	9	27	9	34	
13	9	37	9	44	
15	9	50	9	56	
17	10	00	10	12	
19	10	10	10	27	
21	10	20	10	37	
23	10	30	10	47	
25	10	40	11	06	
27	10	50	11	17	
29	11	10			
31	11	20			
2					
4			12	09	
6	12	11	12	21	
8	12	23	12	33	
10	12	35	12	45	
12	12	47	12	57	
14	12	59	1	10	
16	1	12	1	21	
18	1	23	1	33	
20	1	35	1	46	
22	1	46	1	55	
24	1	57	2	11	
26	2	09	2	18	
28	2	20	2	28	
30	2	30	2	41	
1					
2					

29/28

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	5		6-7	6	5	
1-2	5	5		7-8	6	6	
2-3	5	5		8-9	5	6	
3-4	5	6		9-10	6	6	
4-5	5	5		10-11	6	4	
5-6	5	5		11-12	2	2	
	30	31			31	29	

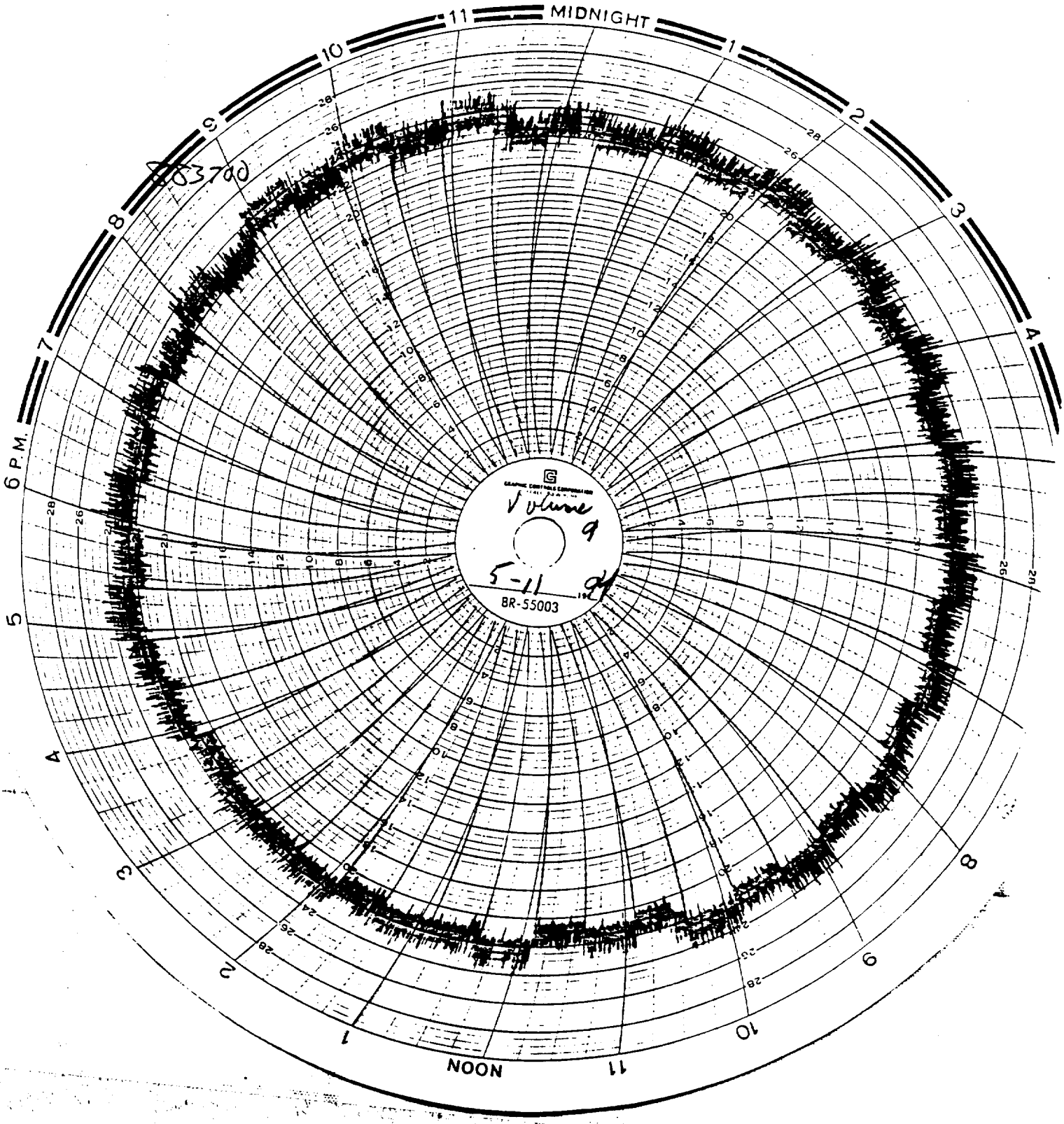
Total Ovens Pushed 61

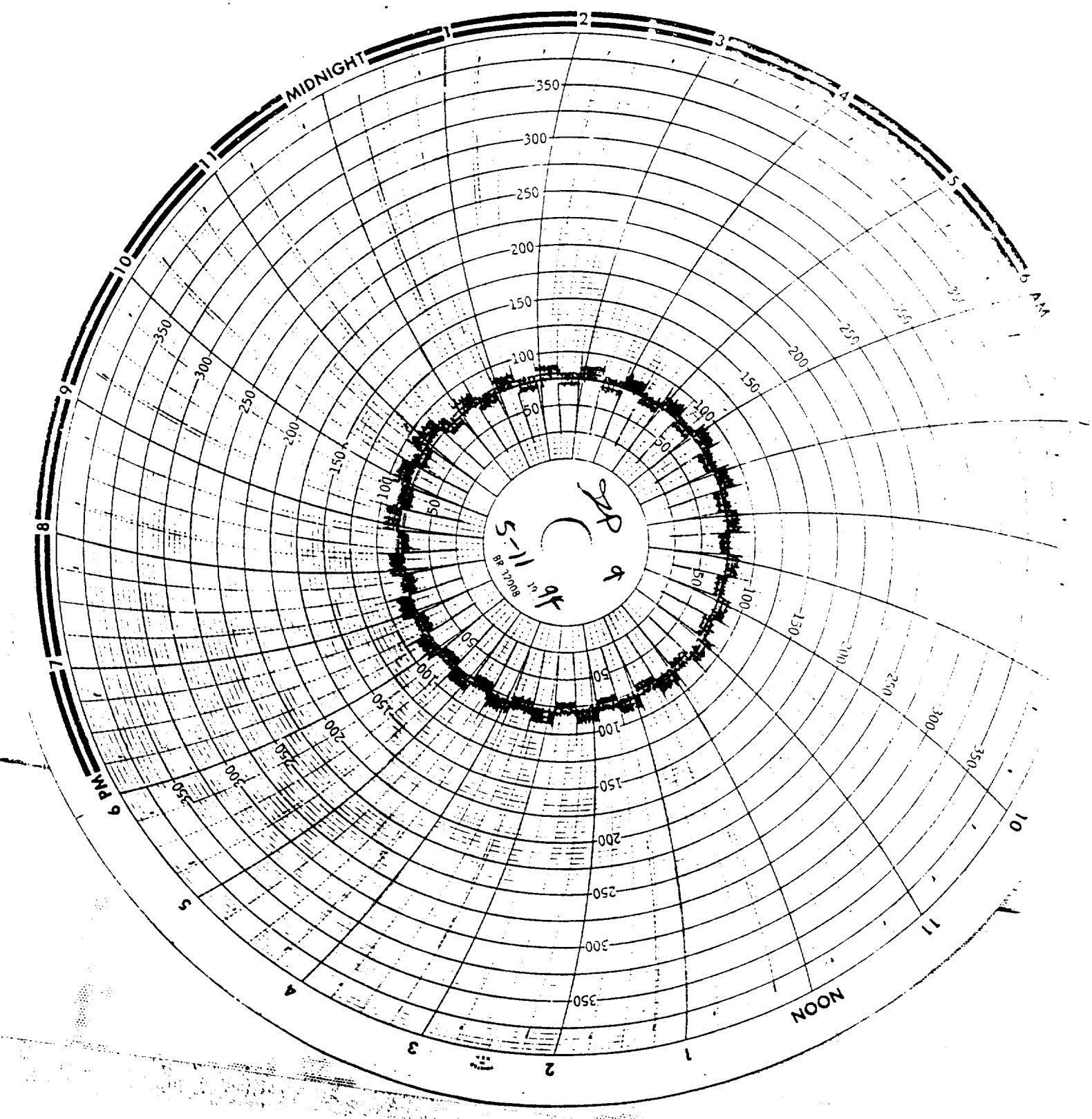
Total Ovens Charged 60

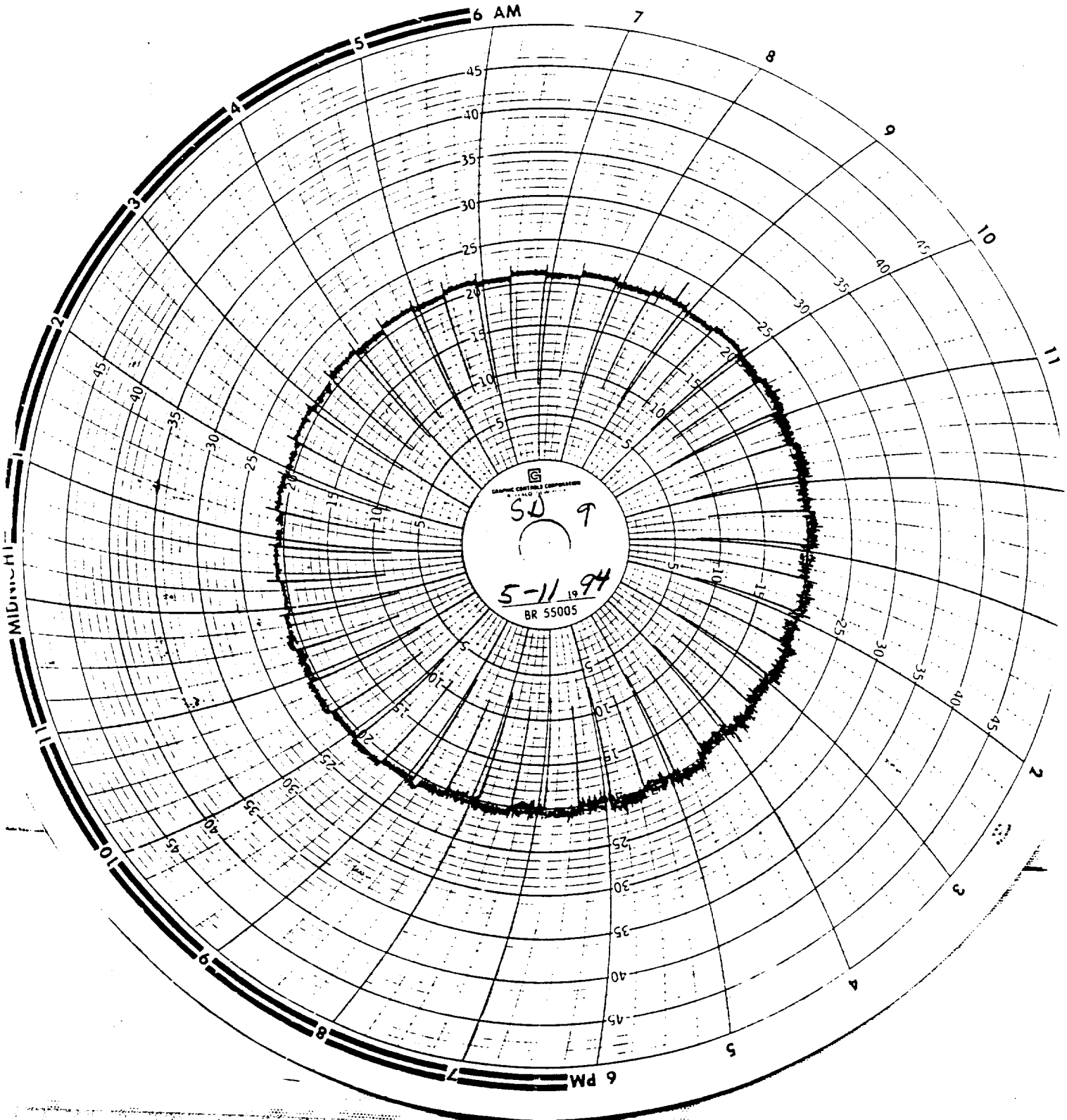
Pusherman

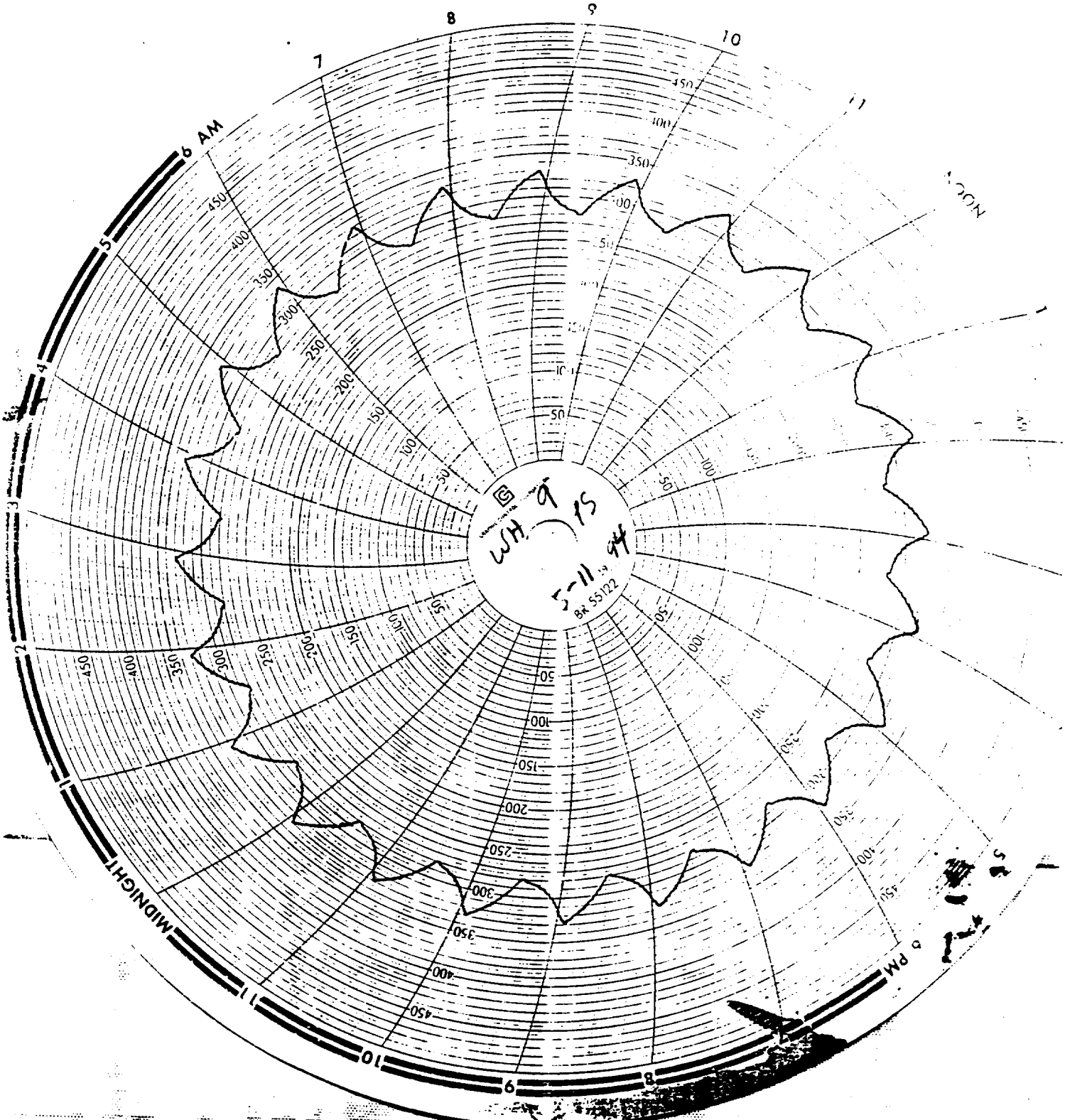
Battery Foreman

MIDNIGHT
6 AM
NOON
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
BR 727
1994
5-11

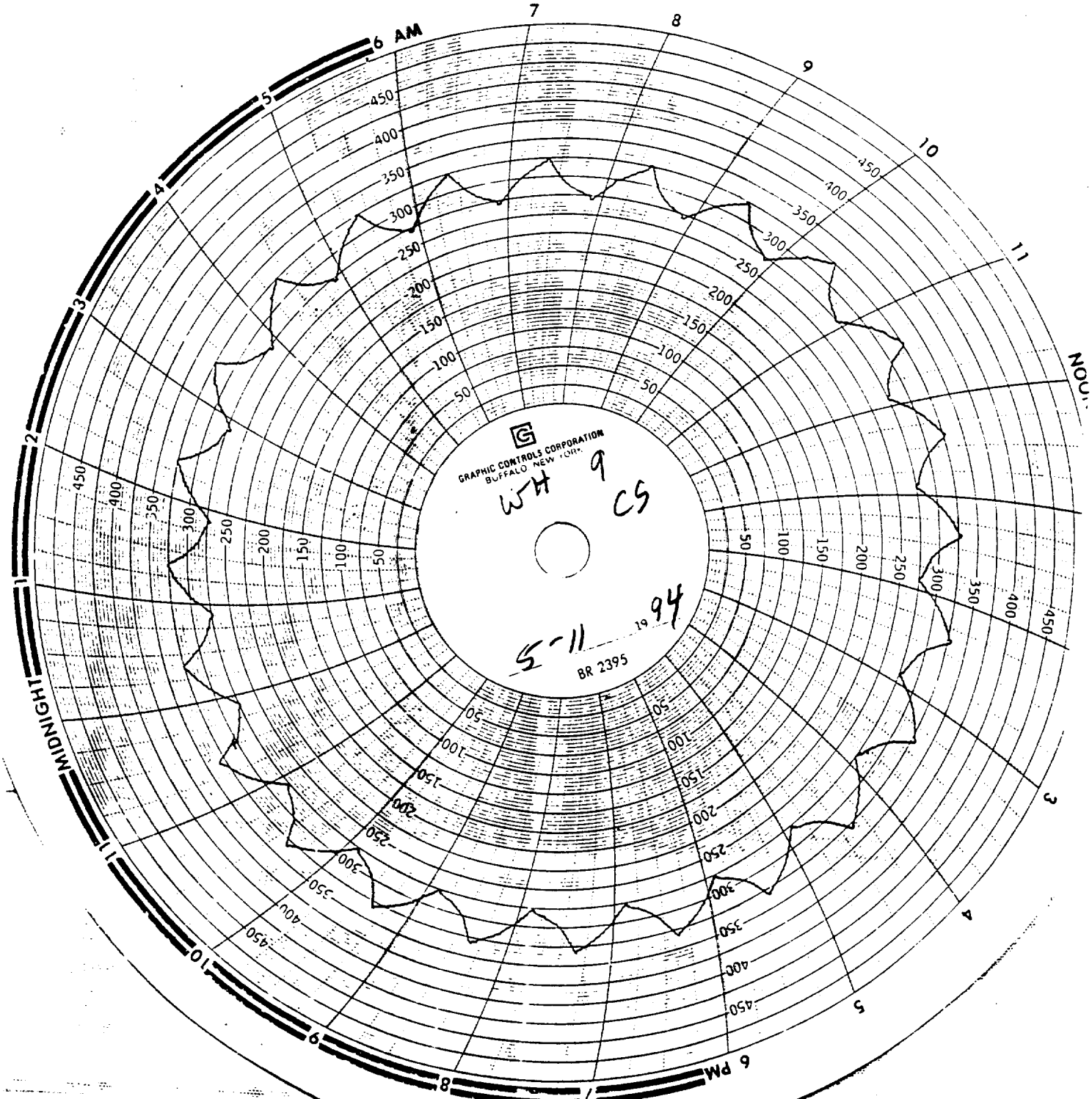

MIDNIGHT
NOON
6 P.M.
Volume 9
5-11
BR-55003

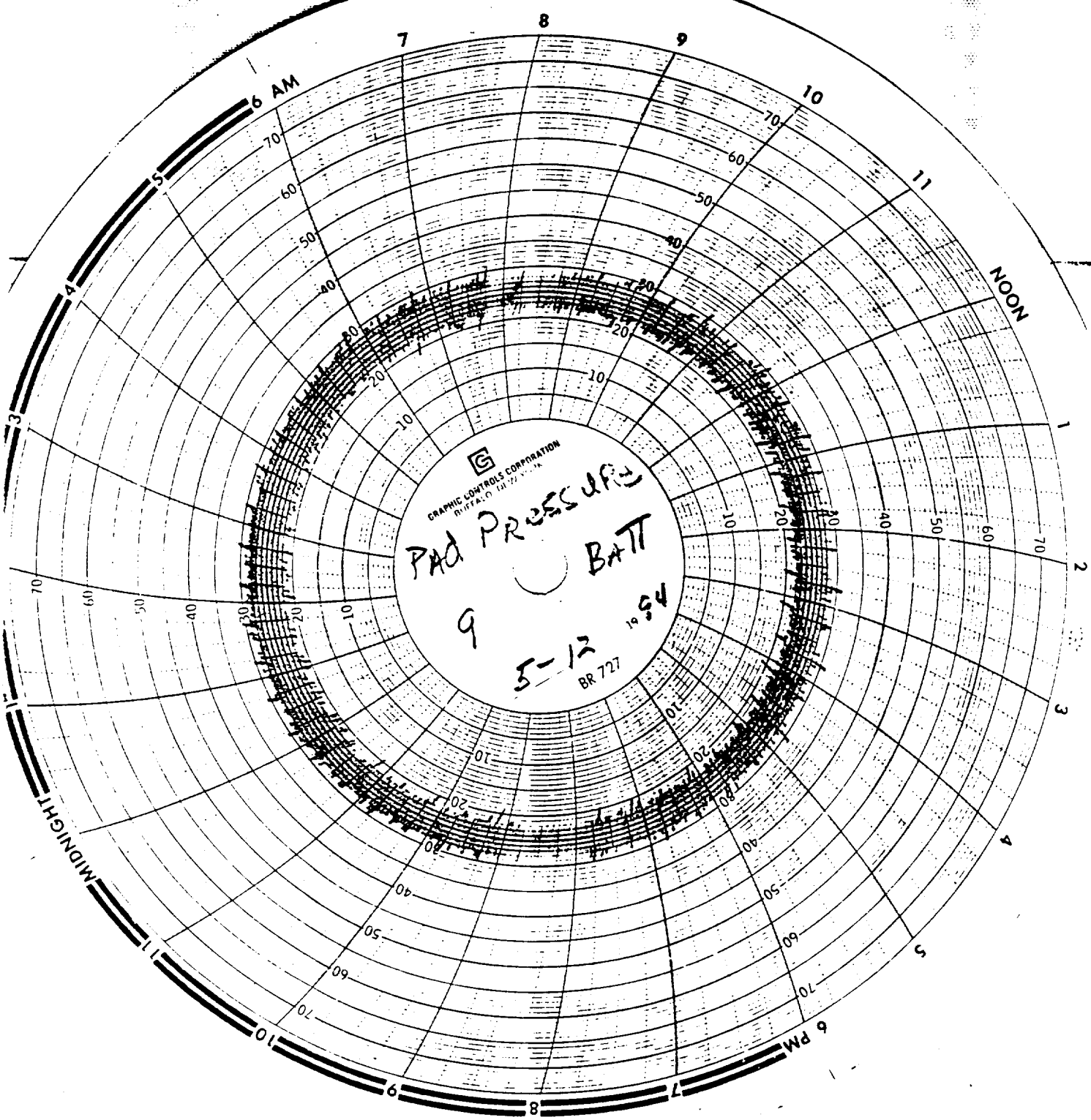

MIDNIGHT
6 AM
NOON
6 PM
5-11 9K
BR 32008


6 AM
6 PM
SD
5-11 1994
BR 55005

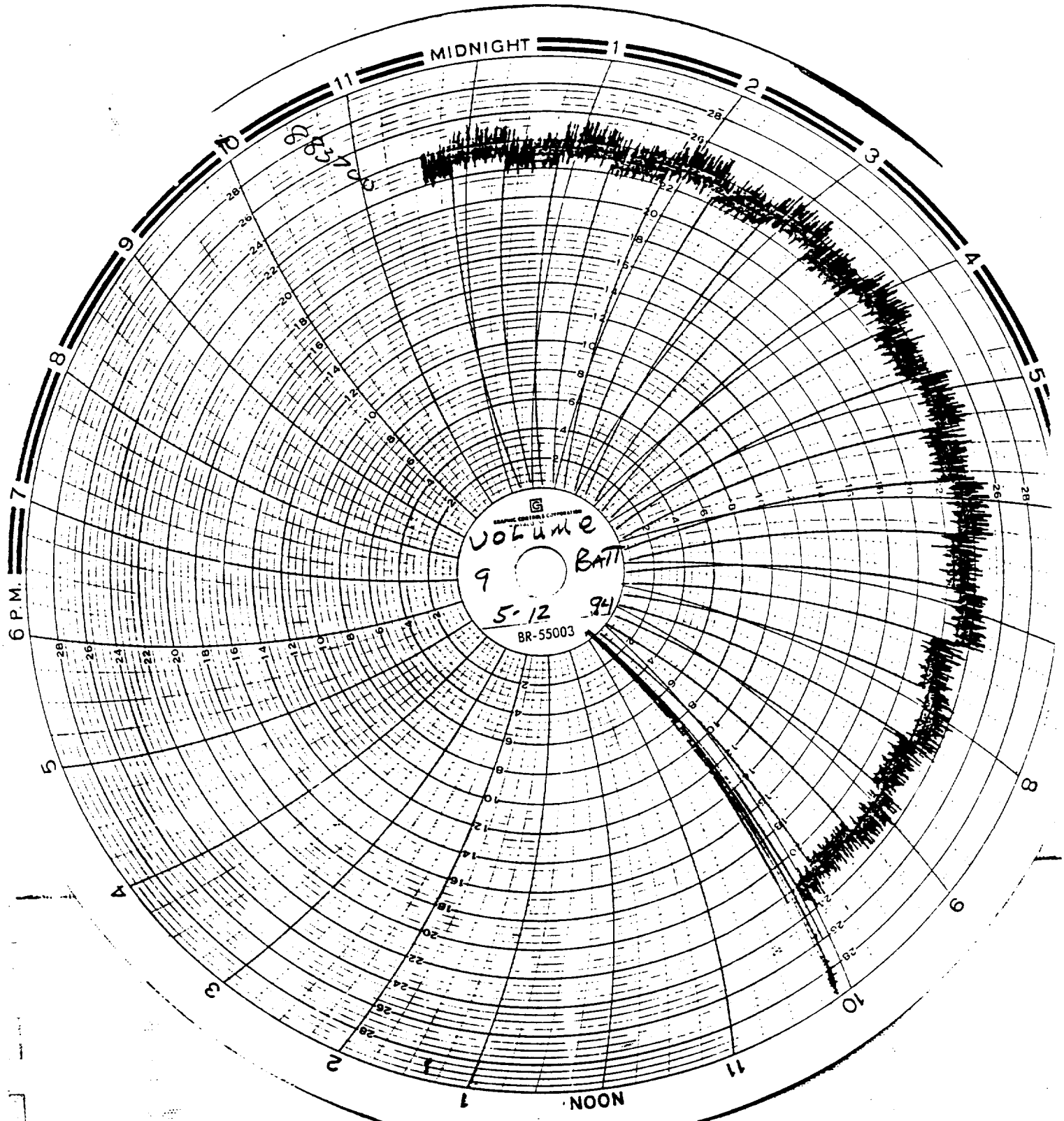


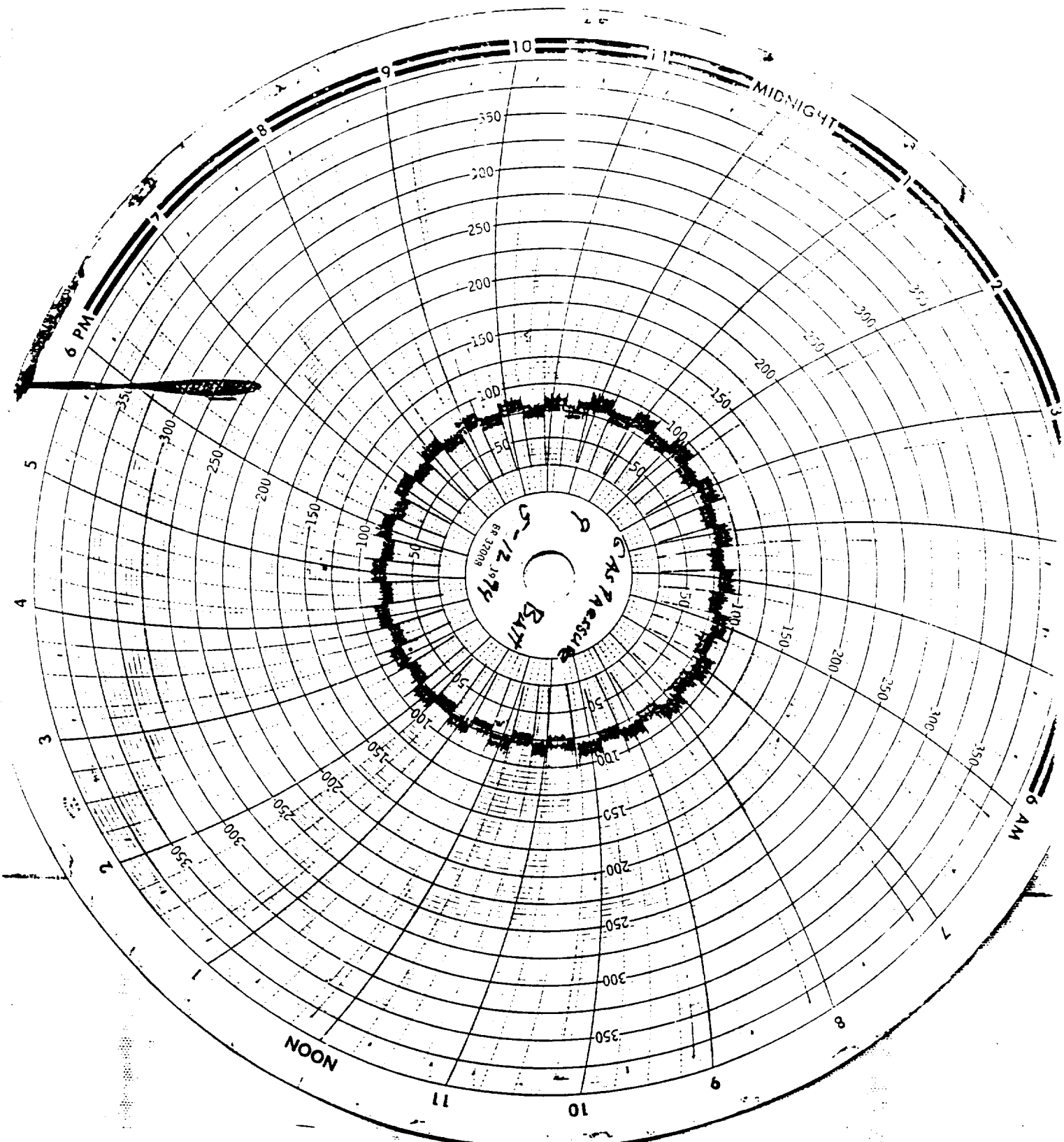
6 AM
MIDNIGHT
6 PM
WH 9 15
5-11 94
BR 55122


GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
WH 9 CS
5-11 1994
BR 2395
MIDNIGHT
6 AM
6 PM
NOON

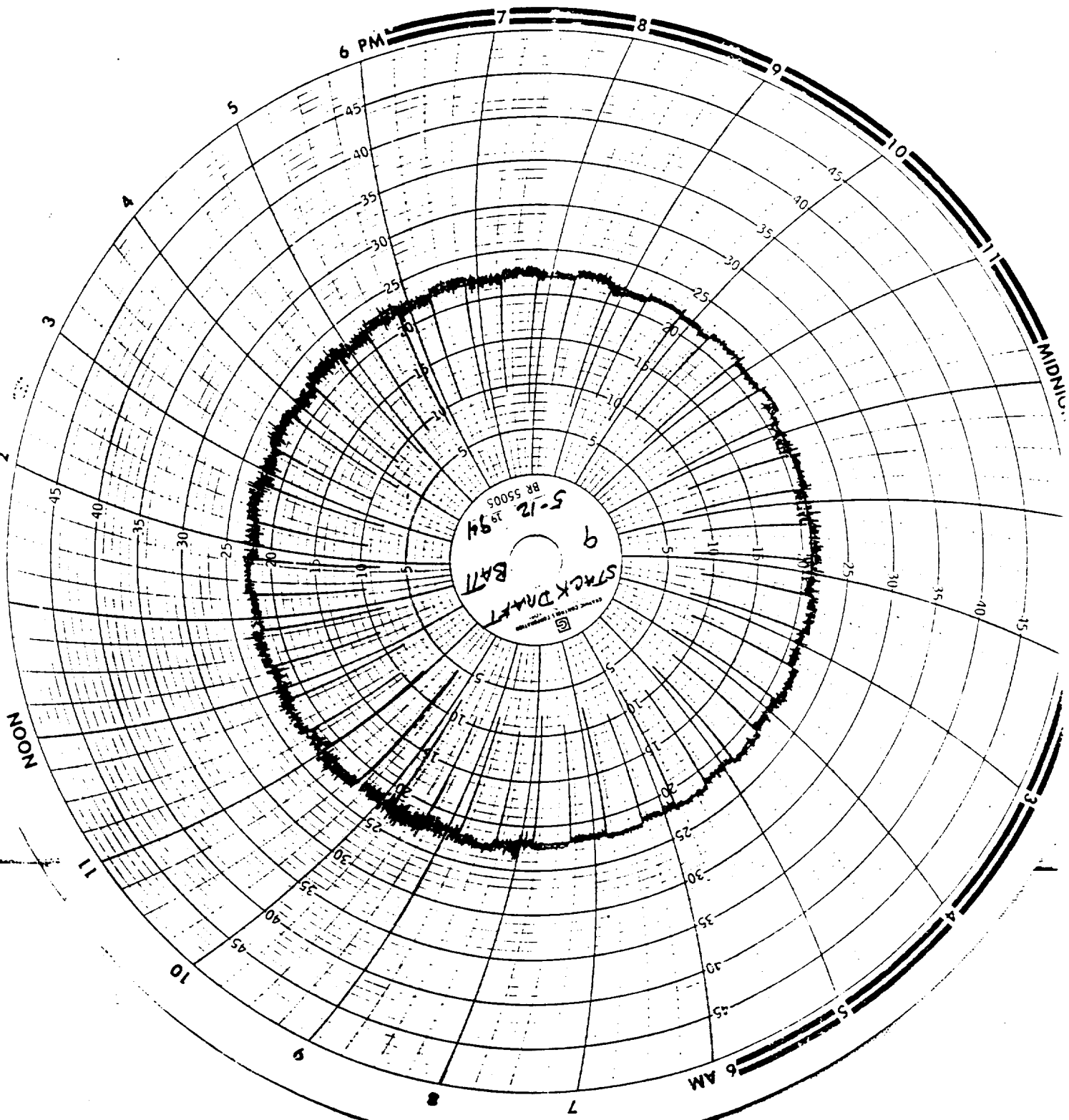

6 AM
NOON
MIDNIGHT
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
PAD PRESSURE
BATT
9
5-12
1994
BR 727

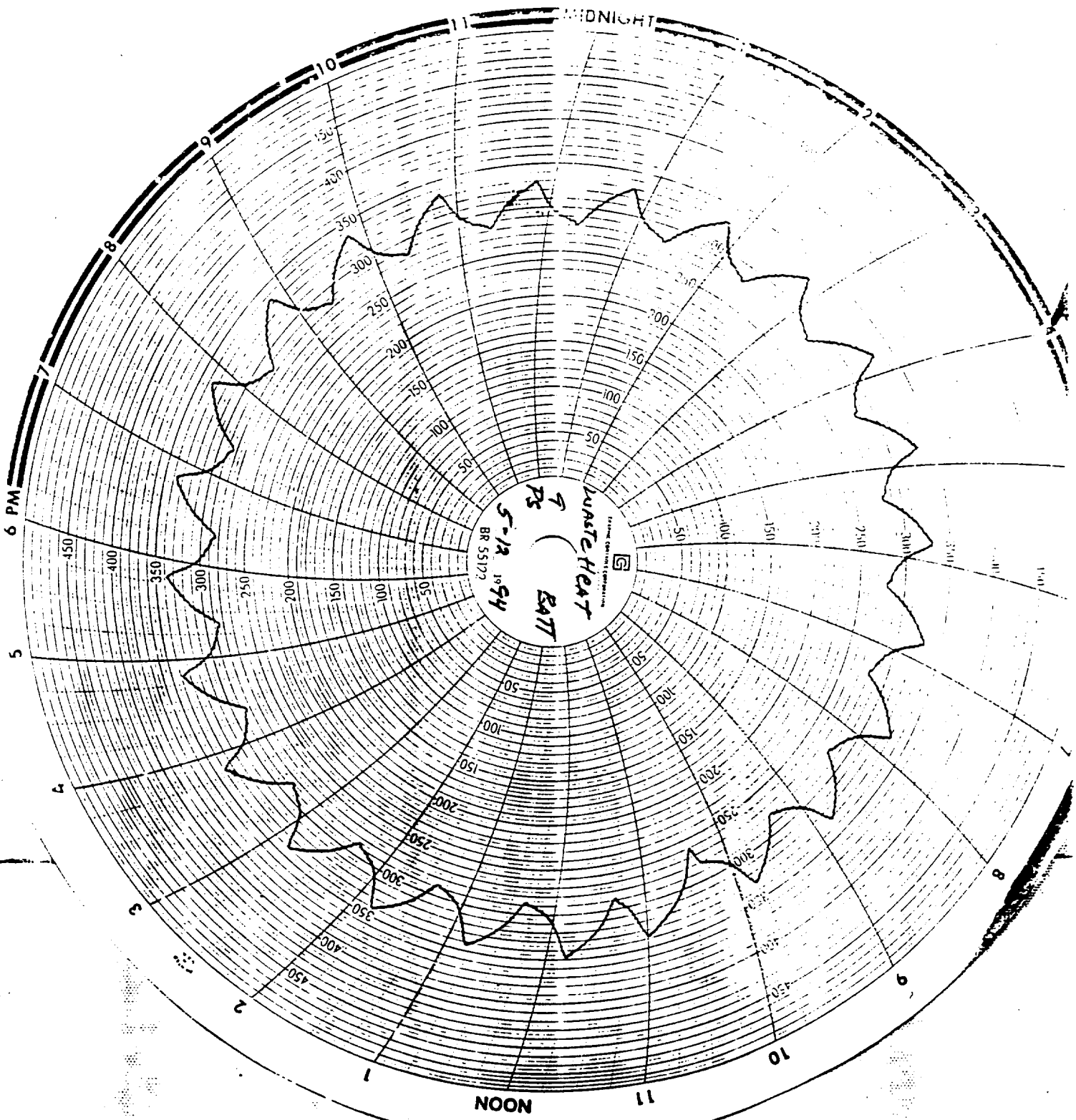
NOON
MIDNIGHT
6 AM
6 PM
CAL
0-400K
ERRE CAL
CHART

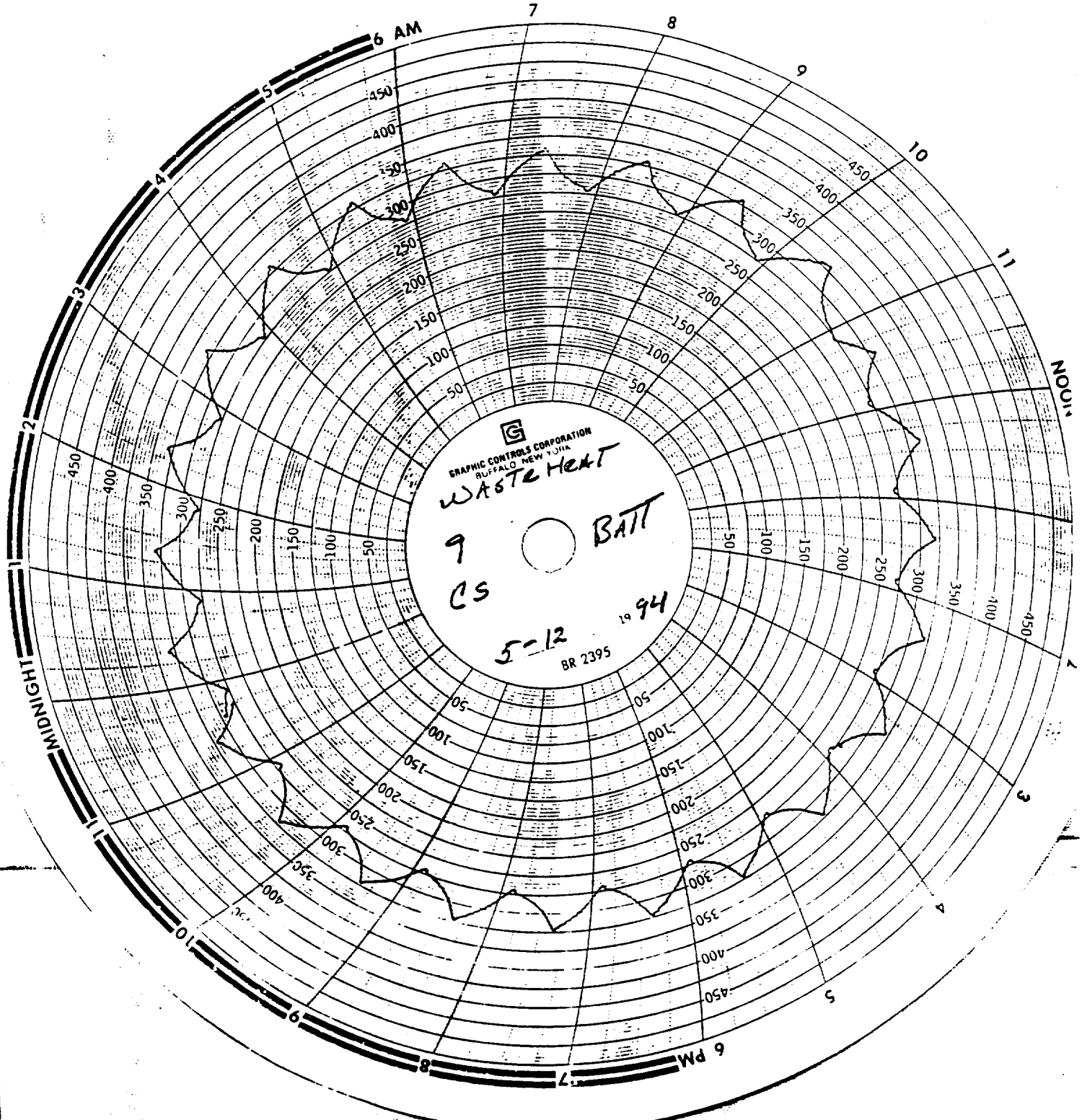

MIDNIGHT
NOON
6 P.M.
Volume
9
BATT
5-12
94
BR-55003



MIDNIGHT
6 PM
6 AM
NOON
Gas Pressure
Batt
5-12 1974


6 PM
7
8
9
10
11
MIDNIGHT
3
4
5
6 AM
7
8
9
10
11
NOON
1
2
3
4
5
STACK DRAFT
BATT
9
5-12 1994
BR 55005


MIDNIGHT
NOON
6 PM
WASTE HEAT
BATT
5-12 1994
BR 55122


GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
WASTE HEAT
9
BATT
CS
5-12
19 94
BR 2395
6 AM
NOON
6 PM
MIDNIGHT

COMPLIANCE DEMONSTRATION
NO. 9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX C

GRAVIMETRIC RESULTS, EMISSIONS CALCULATIONS

CHESTER
ENVIRONMENTAL

CHESTER ENVIRONMENTAL RESOURCES
AIR QUALITY ENGINEERING

ANALYTICAL REPORTING FORM

CLIENT: USS-Clairton Works
PLANT LOCATION: Clairton, PA
PROJECT NUMBER: 393445-02
UNIT TESTED: Battery Stack #9

TEST DATE: 5/11 + 5/12/94
DATE RECEIVED: 5/11 + 5/12/94
DATE ANALYZED: 5/20/94
ANALYTICAL METHOD:

Test Number	Filter ID Number	Component	Cyclone Weight Units ( )	Filter Weight Units (grams)	Soluble Portion of Front Half H2O Rinse Units ( )	Soluble Portion of Front Half Acetone Rinse Units (grams)	Soluble Portion of Back Half H2O Rinse Units ( )	Soluble Portion of Back Half Acetone Rinse Units ( )	0.22μm Filter Insoluble Portion of Back Half H2O Rinse Units ( )
CLR-BS9-1	1228	Particulate		0.0403		0.0325			
CLR-BS9-2	1251	Particulate		0.0350		0.0477			
CLR-BS9-3	1248	Particulate		0.0349		0.0467			

Analyst's Signature: Patricia A. Stockton
Date: 5/23/94

Comments

AQE 10/92

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS — TEST DATE: 05-11-94

TEST SITE #9 BATTERY COMBUSTION STACK — TEST NUMBER: CLR-BS#9-1

A.	Barometric Pressure	29.45	in. Hg	
B.	Static Pressure	-0.90	in. H2O	
C.	Stack Pressure	29.38	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.66	in. H2O	
E.	Meter Pressure	29.57	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.06	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0128		
I.	Stack Diameter	114	in.	
J.	Stack Area	70.88	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	533	°F	
N.	Average Stack Temperature	993	°R	(460+M)
O.	Average Meter Temperature	93	°F	
P.	Average Meter Temperature	553	°R	(460+O)
Q.	Condensate Volume	237.0	mL	
R.	Absorbed H2O	21.5	mL	
S.	Total H2O	258.5	mL	(Q+R)
T.	Filter Weight	0.0403	g	
U.	Probe Weight	0.0325	g	
V.	Impinger Weight		g	
W.	Total Weight	0.0728	g	(T+U+V)
X.	Metered Gas Volume	82.522	dcf	
Y.	Corrected Metered Gas Volume	83.578	dcf	(X*H)
Z.	H2O Gas Volume	12.960	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	96.538	cf	(Y+Z)
BB.	Percent H2O	13.4	%	(100*Z/AA)
CC.	Gas Volume Sampled	78.872	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0142	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.134	[illegible]	18	2.416
CO2	0.040	0.866	44	1.524
CO	0.000	0.866	28	0.000
O2	0.125	0.866	32	3.463
N2	0.835	0.866	28	20.241

Average Molecular Weight 27.64 lb./lb. mol

FF.	Average Stack Velocity	19.4	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	82700	acfm	(60*FF*J)
HH.	Standard Flow Rate	43200	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	95.1	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	4.57	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

TEST DATE: 05-11-94
TEST NUMBER: CLR-BS#9-2

CLIENT: USS CLAIRTON WORKS
TEST SITE #9 BATTERY COMBUSTION STACK

A.	Barometric Pressure	29.45	in. Hg	
B.	Static Pressure	-0.90	in. H2O	
C.	Stack Pressure	29.38	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.79	in. H2O	
E.	Meter Pressure	29.58	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.06	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0128		
I.	Stack Diameter	114	in.	
J.	Stack Area	70.88	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	537	°F	
N.	Average Stack Temperature	997	°R	(460+M)
O.	Average Meter Temperature	101	°F	
P.	Average Meter Temperature	561	°R	(460+O)
Q.	Condensate Volume	232.6	mL	
R.	Absorbed H2O	37.7	mL	
S.	Total H2O	270.3	mL	(Q+R)
T.	Filter Weight	0.0350	g	
U.	Probe Weight	0.0477	g	
V.	Impinger Weight		g	
W.	Total Weight	0.0827	g	(T+U+V)
X.	Metered Gas Volume	86.461	dcf	
Y.	Corrected Metered Gas Volume	87.568	dcf	(X*H)
Z.	H2O Gas Volume	13.748	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	101.316	cf	(Y+Z)
BB.	Percent H2O	13.6	%	(100*Z/AA)
CC.	Gas Volume Sampled	81.485	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0157	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.136		18	2.442
CO2	0.040	0.864	44	1.521
CO	0.000	0.864	28	0.000
O2	0.125	0.864	32	3.457
N2	0.835	0.864	28	20.207

Average Molecular Weight 27.63 lb./lb. mol

FF.	Average Stack Velocity	19.5	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	82900	acfm	(60*FF*J)
HH.	Standard Flow Rate	43100	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	98.7	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	5.00	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS

TEST SITE #9 BATTERY COMBUSTION STACK

TEST DATE: 05-12-94

TEST NUMBER: CLR-BS#9-3

A.	Barometric Pressure	29.38	in. Hg	
B.	Static Pressure	-0.90	in. H2O	
C.	Stack Pressure	29.31	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.57	in. H2O	
E.	Meter Pressure	29.50	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.05	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0128		
I.	Stack Diameter	114	in.	
J.	Stack Area	70.88	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	540	°F	
N.	Average Stack Temperature	1000	°R	(460+M)
O.	Average Meter Temperature	76	°F	
P.	Average Meter Temperature	536	°R	(460+O)
Q.	Condensate Volume	241.3	mL	
R.	Absorbed H2O	20.3	mL	
S.	Total H2O	261.6	mL	(Q+R)
T.	Filter Weight	0.0349	g	
U.	Probe Weight	0.0467	g	
V.	Impinger Weight		g	
W.	Total Weight	0.0816	g	(T+U+V)
X.	Metered Gas Volume	81.408	dcf	
Y.	Corrected Metered Gas Volume	82.450	dcf	(X*H)
Z.	H2O Gas Volume	12.743	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	95.193	cf	(Y+Z)
BB.	Percent H2O	13.4	%	(100*Z/AA)
CC.	Gas Volume Sampled	80.067	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0157	gr/dscf	(15.43*W/CC)
EE.	Average Molecular Weight:			

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.134	[illegible]	18	2.410
CO2	0.045	0.866	44	1.715
CO	0.000	0.866	28	0.000
O2	0.120	0.866	32	3.326
N2	0.835	0.866	28	20.250

Average Molecular Weight 27.70 lb./lb. mol

FF.	Average Stack Velocity	17.8	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	75800	acfm	(60*FF*J)
HH.	Standard Flow Rate	39200	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	106.4	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	4.58	lb/hr	[DD*HH*(1-BB/100)*60/7000]