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. 7 BATTERY COMBUSTION STACK

JUNE 1994

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Project No.: 3934-45-01

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EXECUTIVE SUMMARY

On April 26 and 27, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #7 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 0.0282 grains per dry standard cubic feet (gr/dscf) and 8.45 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 #7 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 25 percent. The average opacity of the exhaust gas in any 3 consecutive minute period was less than or equal to 15 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 April 26 and 27, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #7 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 0.0282 grains per dry standard cubic feet (gr/dscf) and 8.45 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 #7 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 105.1 percent, 103.0 percent, and 102.8 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 25 percent. The average opacity of the exhaust gas in any 3 consecutive minute period was less than or equal to 15 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

#7 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

		Run 1	Run 2	Run 3	Average
Test Number		CLR-BS#7-1	CLR-BS#7-2	CLR-BS#7-3	
Test Date		04-26-94	04-26-94	04-27-94	
Mass Emissions Rate and Concentration					
Particulate Matter	(lb/hr)	11.87	6.65	6.82	8.45
	(gr/dscf)	0.0413	0.0213	0.0220	0.0282
Stack Conditions					
Flow Rate	(acfm)	76300	83700	83900	81300
	(scfm)	39300	43000	43100	41800
	(dscfm)	33500	36500	36200	35400
Temperature	(°F)	535	537	538	537
Moisture Content	(%)	14.7	15.2	15.9	15.3
Sampling Conditions					
Test times		1056 to 1126	1400 to 1430	0755 to 0825	
		1134 to 1204	1434 to 1504	0829 to 0859	
		1209 to 1239	1508 to 1538	0904 to 0934	
		1258 to 1328	1543 to 1613	0938 to 1008	
Sampling Time	(minutes)	120	120	120	
Sample Volume	(dscf)	78.128	83.302	82.588	
Isokinetics	(%)	105.1	103.0	102.8	

CHESTER ENVIRONMENTAL

COMPLIANCE DEMONSTRATION
NO. 7 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX A

TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

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TEST PROTOCOL
COMPLIANCE DEMONSTRATION
#7 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 DATE 04-26-94	ORIFICE CORRECTION (ΔH@) 1.814	HOT/COLD BOX NO. 5
TEST UNIT WASTE HEAT STACK #7	TEST NO. USS-CLR#BS#7-1	METER CORRECTION (Y) 1.0128	PROBE NO. 7-1
PROJECT NO. 3934-45-01	NOZZLE (SIZE,#) 0.490"	CALIBRATION DATE 02 02-94	FILTER NO. 1216
TEST CREW RPC, TM, LG	STATIC PRESSURE -1.0" H_2O	PITOT CORRECTION 0.84	STACK DIA. 114"
BAROMETRIC PRESSURE 29.10	PORT DIRECTION SOUTH, WEST	CONTROL BOX NO. SIX	PORT SIZE 3"

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
2.4	10:56	86.450	.03	.92	.92	86	85	3.0	490	240°F	68°F	250°F	5 min./point
7.6			.03	.92	.92	94	86	3.0	501				
13.5			.04	1.23	1.23	100	86	4.0	511				
20.2			.05	1.54	1.54	109	89	5.5	520				
28.5			.05	1.54	1.54	113	92	5.5	541				
40.6	11:26	105.316	.06	1.81	1.81	113	92	6.5	553				
2.4	11:34	105.316	.03	.90	.90	99	93	4.0	547				
7.6			.05	1.50	1.50	109	93	6.0	535				
13.5			.06	1.80	1.80	114	93	6.5	544				
20.2			.07	2.10	2.10	115	95	7.0	552				
28.5			.08	2.39	2.39	117	95	8.5	564				
40.6	12:04	127.708	.08	2.39	2.39	116	97	9.0	569				
													Estimates:
													MW= 28.8
													%H2O= 10

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.01 cfm
After	10.5	<0.005 cfm

PITOT LEAK CHECK

	Positive	Negative
Before	OK/15SEC	OK/15SEC
After	OK/15 SEC	OK/15SEC

GAS	1	2 (13:15)
CO2	4.0	3.5
O2	12.0	12.0
CO	0	0
N2	84.0	84.5

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI H_2O	836.4	640.4	196.0
2.	100mL DI H_2O	567.5	515.0	52.5
3.	EMPTY	465.1	456.6	8.5
4.	SILICA GEL	697.6	670.7	26.9
5.				
6.				
7.				
8.			total =	283.9g

257.0g

(4.67%)

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS	TEST DATE 04-26-94	ORIFICE CORRECTION (ΔH@) 1.814	HOT/COLD BOX NO. 5
TEST UNIT WASTE HEAT STACK #7	TEST NO. USS-CLA-BS#7-1	METER CORRECTION (Y) 1.0128	PROBE NO. 7-1
PROJECT NO. 3934-45-01	NOZZLE (SIZE,#) 0.490 "	CALIBRATION DATE 02-02-94	FILTER NO. 1216
TEST CREW RIC, PM, LG	STATIC PRESSURE -1.0 "H2O	PITOT CORRECTION 0.84	STACK DIA. 144
BAROMETRIC PRESSURE 29.10	PORT DIRECTION NORTH, EAST	CONTROL BOX NO. SIX	PORT SIZE 3"

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
2.4	12:09	127.708	.03	.90	.90	104	98	4.0	493	~250F	<68F	~250F	5 min./point
7.6			.06	1.80	1.80	113	98	6.5	535				
135			.07	2.10	2.10	113	98	8.0	546				
202			.09	2.69	2.69	119	99	9.5	555				
285			.08	2.39	2.39	620	100	9.5	563				
406	12:39	150.970	.07	2.10	2.10	121	102	9.5	574				
24	12:58	150.970	.03	.90	.90	98	98	4.5	488				
7.6			.04	1.20	1.20	109	97	5.0	500				
135			.05	1.50	1.50	114	97	7.0	530				
202			.05	1.50	1.50	121	100	7.0	534				
285			.05	1.50	1.50	121	102	7.0	542				
406	1:28	170.675	.05	1.50	1.50	122	102	7.0	554				
Test Totals	Δ=120 min	Δ=84.225 dcf	$(\Delta P)_{Avg}$ =	$(\Delta H)_{Avg}$ =			$(T_{meter})_{Avg}$ =		$(T_{stack})_{Avg}$ =				Estimates:
			(.050)	(1.63)			(103°F)		(535°F)				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.	100 mL DI H2O			
2.	100 mL DI H2O			
3.	EMPTY			
4.	SILICA GEL			
5.				
6.				
7.				
8.				

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS CLAIRTON WORKS	TEST DATE 04-26-94	ORIFICE CORRECTION (ΔH@) 1.814	HOT/COLD BOX NO. 7
TEST UNIT WASTE HEAT STACK #7	TEST NO. USS-CLR-BS #7-2	METER CORRECTION (Y) 1.0128	PROBE NO. 7-1
PROJECT NO. 3934-45-001	NOZZLE (SIZE,#) 0.490"	CALIBRATION DATE 02-02-94	FILTER NO. 1217
TEST CREW RPC, TM, LG	STATIC PRESSURE -1.0" H_2O	PITOT CORRECTION 0.84	STACK DIA. 114"
BAROMETRIC PRESSURE 29.10	PORT DIRECTION EAST NORTH	CONTROL BOX NO. S.Y	PORT SIZE 3"

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
2.4	14:00	171.000	.04	1.21	1.21	95	95	1.0	488	~250°F	<68°F	~250°F	5 min./point
7.6			.06	1.82	1.82	111	96	2.0	520				
13.5			.05	1.52	1.52	117	98	2.0	530				
20.2			.05	1.52	1.52	121	99	2.5	541				
28.5			.05	1.52	1.52	123	101	2.5	549				
40.6	14:30	192.210	.05	1.52	1.52	124	102	2.5	559				
2.4	14:34	192.210	.05	1.52	1.52	114	103	2.0	503				
7.6			.07	2.12	2.12	123	103	3.0	522				
13.5			.07	2.12	2.12	125	104	3.0	550				
20.2			.08	2.43	2.43	127	104	3.0	557				
28.5			.08	2.43	2.43	129	106	3.0	559				
40.6	15:04	217.200	.07	2.12	2.12	129	106	2.5	580				
													Estimates:
													MW= 28.8
													%H2O= 10

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.01 cfm
After	6.0	<0.01 cfm

PITOT LEAK CHECK

	Positive	Negative
Before	0°C/15sec	0°C/15sec
After	0°C/15sec	0°C/15sec

GAS	1440 1	1510 2
CO2	4.0	4.0
O2	12.0	12.0
CO	0	0
N2	84.0	84.0

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL DI H_2O	864.3	674.8	189.5
2.	100 mL DI H_2O	662.0	571.3	90.7
3.	EMPTY	468.8	458.4	8.4
4.	SILICA GEL	675.6	649.6	26.0
5.				
6.				
7.				
8.			total=	314.6g

298.6g

FINAL 466.8

15.17%

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STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS	TEST DATE 04-26-94	ORIFICE CORRECTION (ΔH@) 1.814	HOT/COLD BOX NO. 7
TEST UNIT WASTE HEAT STACK # 7	TEST NO. USS-CLA-657-2	METER CORRECTION (Y) 1.0128	PROBE NO. 7-1
PROJECT NO. 3934-45-01	NOZZLE (SIZE,#) 0.490"	CALIBRATION DATE 02-02-94	FILTER NO. 1217
TEST CREW RPC, TM, LG	STATIC PRESSURE -1.0" H_2O	PITOT CORRECTION 0.84	STACK DIA. 114"
BAROMETRIC PRESSURE 29.10	PORT DIRECTION WEST, SOUTH	CONTROL BOX NO. SIR	PORT SIZE 3"

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
2.4	15:08	217.200	.05	1.52	1.52	110	108	1.5	515	~250°	568	~250°	5 min./point
7.6			.06	1.82	1.82	122	107	3.0	521				
13.5			.06	1.82	1.82	122	107	3.0	520				
20.2			.06	1.82	1.82	123	107	3.0	551				
28.5			.08	2.43	2.43	128	108	4.0	548				
40.6	15:38	240.846	.05	1.52	1.52	129	108	3.0	530				
2.4	15:43	240.840	.05	1.52	1.52	110	105	1.5	500				
7.6	~~15:43~~ RPC	~~240.840~~ RPC	.06	1.82	1.82	120	107	3.0	511				
13.5			.05	1.52	1.52	125	105	2.0	558				
20.2			.04	1.21	1.21	125	106	2.0	568				
28.5			.04	1.21	1.21	125	105	2.0	577				
40.6	16:13	262.218	.04	1.21	1.21	125	105	2.0	531				
Test Totals	Δ=120 min	Δ=91.218 dcf	$(\Delta p)_{AVG}$ = 0.06	$(\Delta H)_{AVG}$ = 1.72		$(T_{meter})_{AVG}$ =	112°F		$(T_{stack})_{AVG}$ = 537°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.	100 mL DI H_2O			
2.	100 mL DI H_2O			
3.	EMPTY			
4.	SILICA GEL			
5.				
6.				
7.				
8.				

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS | TEST DATE 04-27-94 | ORIFICE CORRECTION (ΔH@) 1.814 | HOT/COLD BOX NO. #5
TEST UNIT WASTE HEAT STACK #7 | TEST NO. USS-CLR-BS#7-3 | METER CORRECTION (Y) 1.012 | PROBE NO. 7-1
PROJECT NO. 3934-45-01 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 02-02-94 | FILTER NO. 1221
TEST CREW RPC, TAM, LG | STATIC PRESSURE -1.0" H2O | PITOT CORRECTION 0.84 | STACK DIA. 114"
BAROMETRIC PRESSURE 29.10 | PORT DIRECTION SOUTH, WEST | CONTROL BOX NO. SIX | PORT SIZE 3.0"

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
2.4	07:55	262.465	.04	1.17	1.17	73	73	4.5	489	~250°F	<68°F	~250°F	5 min./point
7.6			.04	1.17	1.17	87	74	4.5	502				
13.5			.05	1.46	1.46	93	76	6.0	559				
20.2			.06	1.75	1.75	98	77	6.5	530				
28.5			.05	1.46	1.46	102	80	6.0	540				
40.6	08:25	282.368	.06	1.75	1.75	105	82	6.5	549				
2.4	08:29	282.368	.06	1.75	1.75	100	84	7.0	499				
7.6			.06	1.75	1.75	105	85	7.0	540				
13.5			.07	2.07	2.07	108	85	8.5	533				
20.2			.08	2.37	2.37	108	87	9.5	546				
28.5			.08	2.37	2.37	109	88	9.5	557				
40.6	09:59	306.622 (306.622)	.09	2.66	2.66	109	90	10.0	565				
													Estimates:
													MW= 28.8
													%H2O= 10

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.01 CFM
After	12.0	<0.01 CFM

PITOT LEAK CHECK

	Positive	Negative
Before	OK/1.5 GAL	OK/1.5 GAL
After	OK/1.5 GAL	OK/1.5 GAL

GAS	08/01	08/02
CO2	4.0	4.0
O2	12.0	12.0
CO	0	0
N2	84.0	84.0

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 ml DI H2O	804.4	561.1	243.3
2.	100 ml DI H2O	553.5	496.6	56.9
3.	EMPTY	473.0	465.1	7.9
4.	SILICA GEL.	701.9	679.6	22.3
5.				
6.				
7.				
8.			total =	330.4 g

308.1 g

15.9 g

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS	TEST DATE 04-27-94	ORIFICE CORRECTION (ΔH@) 1.814	HOT/COLD BOX NO. 5
TEST UNIT WASTE HEAT STACK #7	TEST NO. USS-CLR-BS#7-3	METER CORRECTION (Y) 1.0128	PROBE NO. 7-1
PROJECT NO. 3934-45-01	NOZZLE (SIZE,#) 0.490"	CALIBRATION DATE 02-02-94	FILTER NO. 1221
TEST CREW RPC, TM, LG	STATIC PRESSURE ~~+~~ -1.0 "H2O	PITOT CORRECTION 0.84	STACK DIA. 14'
BAROMETRIC PRESSURE 29.10	PORT DIRECTION NORTH, EAST	CONTROL BOX NO. SIX	PORT SIZE 3.0"

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
2.4	09:04	306.622	.06	1.77	1.77	95	90	7.5	540	~250°F	<68°F	~250°	5 min./point
7.6			.07	1.90	1.90	108	90	8.0	524				
13.5			.08	2.17	2.17	110	90	8.5	538				
20.2			.07	1.90	1.90	111	92	8.0	530				
29.5			.07	1.90	1.90	113	92	8.0	585				
40.6	09:34	329.961	.08	2.17	2.17	113	93	9.0	565				
2.4	09:38	329.961	.05	1.36	1.36	100	94	5.5	490				
7.6			.06	1.77	1.77	112	94	7.5	531				
13.5			.06	1.77	1.77	114	94	7.5	557				
20.2			.05	1.36	1.36	115	95	5.5	565				
29.5			.05	1.36	1.36	116	95	5.5	570				
40.6	10:08	350.360	.05	1.36	1.36	116	95	5.5	581				
Test Totals	Δ=120 min	Δ=87.895 dcf	$(\Delta p)_{Avg}$ = 0.06	$(\Delta H)_{Avg}$ = 1.77			$(T_{meter})_{Avg}$ = 96		$(T_{stack})_{Avg}$ = 538				Estimates: MW= 28.9 %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

VISIBLE EMISSIONS OBSERVATIONS FORM

2 STACK TEST

OBSERVER: Lane Quarles

DATE: 4-26-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 10:30

END TIME: 11:30

OBSERVATION POINT:

MAPLE AVE LOT

SOURCE:

DISTANCE: 700'

DIRECTION FROM: S-W

HEIGHT: 200

WIND:

SPEED: 13 MPH

DIRECTION: S-W

TEMPERATURE: 75°F

SKY CONDITION: SUNNY + HAZY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: —

CREW: C FOREMAN: ZACUR

COMMENTS: — 50%

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM

1 STACK TEST

OBSERVER: James Quarles

DATE: 4-26-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 11:30

END TIME: 12:30

OBSERVATION POINT:

MAPLE AVE LOT

SOURCE:

DISTANCE: 700'

DIRECTION FROM: S-W

HEIGHT: 200'

WIND:

SPEED: 13 MPH

DIRECTION: S-W

TEMPERATURE: 78 °F

SKY CONDITION: SUNNY + HAZY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION: -

TOTAL No. OF READINGS: 240

No. READINGS >= 20% -

No. READINGS >= 60% -

GREATEST OPACITY: -

CREW: C FOREMAN: ZACUR

COMMENTS: - = 0%

0	-	-	-	-	30	-	-	-	-
1	-	-	-	-	31	-	-	-	-
2	-	-	-	-	32	-	-	-	-
3	-	-	-	-	33	-	-	-	-
4	-	-	-	-	34	-	-	-	-
5	-	-	-	-	35	-	-	-	-
6	-	-	-	-	36	-	-	-	-
7	-	-	-	-	37	-	-	-	-
8	-	-	-	-	38	-	-	-	-
9	-	-	-	-	39	-	-	-	-
10	-	-	-	-	40	-	-	-	-
11	-	-	-	-	41	-	-	-	-
12	-	-	-	-	42	-	-	-	-
13	-	-	-	-	43	-	-	-	-
14	-	-	-	-	44	-	-	-	-
15	-	-	-	-	45	-	-	-	-
16	-	-	-	-	46	-	-	-	-
17	-	-	-	-	47	-	-	-	-
18	-	-	-	-	48	-	-	-	-
19	-	-	-	-	49	-	-	-	-
20	-	-	-	-	50	-	-	-	-
21	-	-	-	-	51	-	-	-	-
22	-	-	-	-	52	-	-	-	-
23	-	-	-	-	53	-	-	-	-
24	-	-	-	-	54	-	-	-	-
25	-	-	-	-	55	-	-	-	-
26	-	-	-	-	56	-	-	-	-
27	-	-	-	-	57	-	-	-	-
28	-	-	-	-	58	-	-	-	-
29	-	-	-	-	59	-	-	-	-

VISIBLE EMISSIONS OBSERVATIONS FORM

7 STACK Test

OBSERVER: [signature]

DATE: 4-26-94

FACILITY: USX-CLAIRTON

OBSERVATION: START TIME: 12:30

END TIME: 13:30

OBSERVATION POINT:

WABASH AVE. LOT

SOURCE:

DISTANCE: 700'

DIRECTION FROM: S-W

HEIGHT: 200'

WIND:

SPEED: 13 MPH

DIRECTION: S-W

TEMPERATURE: 78°F

SKY CONDITION: SUNNY + HAZY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION: BLACK

TOTAL No. OF READINGS: 240

No. READINGS >= 20%: 0

No. READINGS >= 60%: 0

GREATEST OPACITY: 15%

CREW: C FOREMAN: ZACUR

COMMENTS: - = 0%

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

30	-	-	-	-
31	-	-	-	-
32	-	-	-	-
33	-	-	-	-
34	-	-	-	-
35	-	-	-	-
36	-	-	-	-
37	-	-	-	-
38	-	-	-	-
39	-	-	-	-
40	-	-	-	-
41	-	-	-	-
42	-	-	-	-
43	-	-	-	-
44	-	-	-	-
45	-	-	-	-
46	-	-	-	-
47	-	-	-	-
48	-	-	-	-
49	-	-	-	-
50	-	-	-	-
51	-	-	-	-
52	-	-	-	-
53	-	-	-	-
54	-	-	-	-
55	-	-	-	-
56	-	-	5	-
57	5	10	10	10
58	15	15	10	10
59	10	5	5	-

B-1

VISIBLE EMISSIONS OBSERVATIONS FORM

7 STACK TEST

OBSERVER: [signature]

DATE: 4-26-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 13:30

END TIME: 14:30

OBSERVATION POINT:

WABASH AVE LOT

SOURCE:

DISTANCE: 700'

DIRECTION FROM: S.W

HEIGHT: 200'

WIND:

SPEED: 14 MPH

DIRECTION: S-W

TEMPERATURE: 81°F

SKY CONDITION: SUNNY + HAZY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: —

CREW: C FOREMAN: ZACH

COMMENTS: — = 0%

0	-	-	-	-	30	-	-	-	-
1	-	-	-	-	31	-	-	-	-
2	-	-	-	-	32	-	-	-	-
3	-	-	-	-	33	-	-	-	-
4	-	-	-	-	34	-	-	-	-
5	-	-	-	-	35	-	-	-	-
6	-	-	-	-	36	-	-	-	-
7	-	-	-	-	37	-	-	-	-
8	-	-	-	-	38	-	-	-	-
9	-	-	-	-	39	-	-	-	-
10	-	-	-	-	40	-	-	-	-
11	-	-	-	-	41	-	-	-	-
12	-	-	-	-	42	-	-	-	-
13	-	-	-	-	43	-	-	-	-
14	-	-	-	-	44	-	-	-	-
15	-	-	-	-	45	-	-	-	-
16	-	-	-	-	46	-	-	-	-
17	-	-	-	-	47	-	-	-	-
18	-	-	-	-	48	-	-	-	-
19	-	-	-	-	49	-	-	-	-
20	-	-	-	-	50	-	-	-	-
21	-	-	-	-	51	-	-	-	-
22	-	-	-	-	52	-	-	-	-
23	-	-	-	-	53	-	-	-	-
24	-	-	-	-	54	-	-	-	-
25	-	-	-	-	55	-	-	-	-
26	-	-	-	-	56	-	-	-	-
27	-	-	-	-	57	-	-	-	-
28	-	-	-	-	58	-	-	-	-
29	-	-	-	-	59	-	-	-	-

VISIBLE EMISSIONS OBSERVATIONS FORM

7 STACK TEST

OBSERVER: James Pressley

DATE: 4-26-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 14:30

END TIME: 15:30

OBSERVATION POINT:

WABASH AVE. LOT

SOURCE:

DISTANCE: 700'

DIRECTION FROM: S-W

HEIGHT: 200'

WIND:

SPEED: 16 MPH

DIRECTION: S-W

TEMPERATURE: 82°F

SKY CONDITION: SUNNY + HAZY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION: BLACK

TOTAL No. OF READINGS: 240

No. READINGS >= 20% -

No. READINGS >= 60% -

GREATEST OPACITY: 15%

CREW: C FOREMAN: ZACUR

COMMENTS: - = 0%

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

30	-	-	-	-
31	-	-	-	-
32	-	-	-	-
33	-	-	-	-
34	-	-	-	-
35	-	-	-	-
36	-	-	-	-
37	-	-	-	-
38	-	-	-	-
39	-	-	-	-
40	-	-	-	-
41	-	-	-	-
42	-	-	-	-
43	-	-	-	-
44	-	-	-	-
45	-	-	-	-
46	-	-	-	-
47	-	-	-	-
48	-	-	-	-
49	-	-	-	-
50	-	-	-	-
51	-	-	-	-
52	-	-	-	-
53	-	-	-	-
54	-	-	-	-
55	-	-	-	-
56	-	-	-	-
57	5	10	10	15
58	10	5	5	-
59	-	-	-	-

VISIBLE EMISSIONS OBSERVATIONS FORM

7 STACK TEST

OBSERVER: Lance Dunlap

DATE: 4-26-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 15:30
END TIME: 16:20

OBSERVATION POINT:
MAPLE AVE LOT

SOURCE:

DISTANCE: 700'
DIRECTION FROM: S-W
HEIGHT: 200

WIND:

SPEED: 17 MPH
DIRECTION: S-W
TEMPERATURE: 84°F
SKY CONDITION: SUNNY + HAZY
BACKGROUND: SKY

READING CONDITIONS: GOOD
COLOR OF EMISSION: BLACK

TOTAL No. OF READINGS: 200
No. READINGS >= 20%: 0
No. READINGS >= 60%: 0
GREATEST OPACITY: 15%
CREW: C FOREMAN: ZACHARY SMITH

COMMENTS: ~=0%

0	-	-	-	-	30	-	-	-	-
1	-	-	-	-	31	-	-	-	-
2	-	-	-	-	32	-	-	-	-
3	-	-	-	-	33	-	-	-	-
4	-	-	-	-	34	-	-	-	-
5	-	-	-	-	35	-	-	-	-
6	-	-	-	-	36	-	-	-	-
7	-	-	-	-	37	-	-	-	-
8	-	-	-	-	38	-	-	-	-
9	-	-	-	-	39	-	-	-	-
10	-	-	-	-	40	-	-	-	-
11	-	-	-	-	41	5	15	15	15
12	-	-	-	-	42	10	10	5	5
13	-	-	-	-	43	5	-	-	-
14	-	-	-	-	44	-	-	-	-
15	-	-	-	-	45	10	15	5	5
16	-	-	-	-	46	-	-	-	-
17	-	-	-	-	47	-	-	-	-
18	-	-	-	-	48	-	-	-	-
19	-	-	-	-	49	-	-	-	-
20	-	-	-	-	50				
21	-	-	-	-	51				
22	-	-	-	-	52				
23	-	-	-	-	53				
24	-	-	-	-	54				
25	-	-	-	-	55				
26	-	-	-	-	56				
27	-	-	-	-	57				
28	-	-	-	-	58				
29	-	-	-	-	59				

VISIBLE EMISSIONS OBSERVATIONS FORM

1 STACK TEST

OBSERVER: James Saunders

DATE: 4-27-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 7:45

END TIME: 8:45

OBSERVATION POINT:

MAPLE AVE LOT

SOURCE:

DISTANCE: 700'

DIRECTION FROM: S-W

HEIGHT: 200'

WIND:

SPEED: 10 MPH

DIRECTION: S-W

TEMPERATURE: 68

SKY CONDITION: SOME CLOUDS + HAZE

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: -

TOTAL No. OF READINGS: 240

No. READINGS >= 20% -

No. READINGS >= 60% -

GREATEST OPACITY: -

CREW: D FOREMAN: SAWDERS

COMMENTS: - = 0%

0	-	-	-	-	30	-	-	-	-
1	-	-	-	-	31	-	-	-	-
2	-	-	-	-	32	-	-	-	-
3	-	-	-	-	33	-	-	-	-
4	-	-	-	-	34	-	-	-	-
5	-	-	-	-	35	-	-	-	-
6	-	-	-	-	36	-	-	-	-
7	-	-	-	-	37	-	-	-	-
8	-	-	-	-	38	-	-	-	-
9	-	-	-	-	39	-	-	-	-
10	-	-	-	-	40	-	-	-	-
11	-	-	-	-	41	-	-	-	-
12	-	-	-	-	42	-	-	-	-
13	-	-	-	-	43	-	-	-	-
14	-	-	-	-	44	-	-	-	-
15	-	-	-	-	45	-	-	-	-
16	-	-	-	-	46	-	-	-	-
17	-	-	-	-	47	-	-	-	-
18	-	-	-	-	48	-	-	-	-
19	-	-	-	-	49	-	-	-	-
20	-	-	-	-	50	-	-	-	-
21	-	-	-	-	51	-	-	-	-
22	-	-	-	-	52	-	-	-	-
23	-	-	-	-	53	-	-	-	-
24	-	-	-	-	54	-	-	-	-
25	-	-	-	-	55	-	-	-	-
26	-	-	-	-	56	-	-	-	-
27	-	-	-	-	57	-	-	-	-
28	-	-	-	-	58	-	-	-	-
29	-	-	-	-	59	-	-	-	-

VISIBLE EMISSIONS OBSERVATIONS FORM

7 STACK TEST

OBSERVER: [signature]

DATE: 4-27-94

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 8:45

END TIME: 9:45

OBSERVATION POINT:
MAPLE AVE LOT

SOURCE:

DISTANCE: 700'

DIRECTION FROM: S-W

HEIGHT: 200'

WIND:

SPEED: 14 MPH

DIRECTION: S-W

TEMPERATURE: 73°F

SKY CONDITION: SUNNY + HAZY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: —

CREW: D FOREMAN: SAWDER'S

COMMENTS: — 20%

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM

2 STACK TEST

OBSERVER: [signature]

DATE: 4-27-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 9:45

END TIME: 10:15

OBSERVATION POINT:
MAPLE AVE LOT

SOURCE:

DISTANCE: 700'

DIRECTION FROM: S-W

HEIGHT: 200'

WIND:

SPEED: 16 MPH

DIRECTION: S-W

TEMPERATURE: 75°F

SKY CONDITION: SUNNY + HAZY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: BLACK

TOTAL No. OF READINGS: 120

No. READINGS >= 20% 2

No. READINGS >= 60% 0

GREATEST OPACITY: 25%

CREW: D FOREMAN: SAWDENS

COMMENTS: - 20%

B-17

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

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

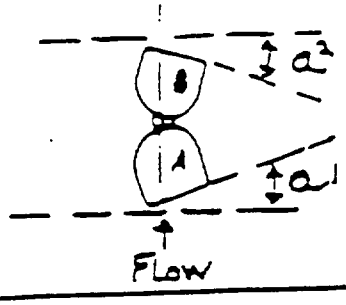
ORIFICE BAPC-3 DATE 06-09-94 B.P. 29.00
OPERATOR RPC BOX # 6

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 # XCF-59
Precheck
Post Check

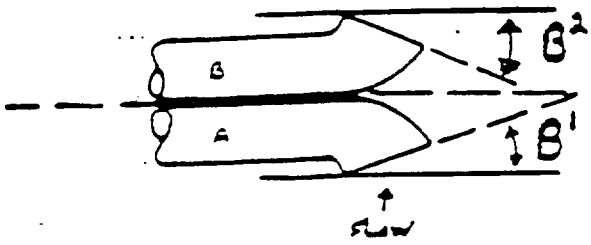
Probe #: 7-1
Date: 1-24-94
Initials: gm

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"

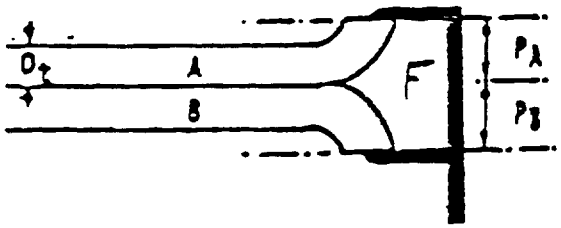
② 

μ = .0008 — μ = ≤ 0.1250" ($\mu = F \tan\gamma$)

V = 0.0262 — V = ≤0.03125" ($V = F \tan\theta$)

W = 1.160 — W ≥ 0"

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

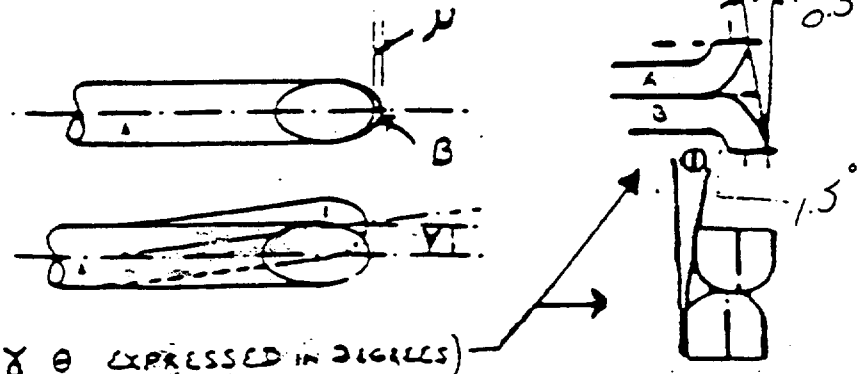
③ 

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

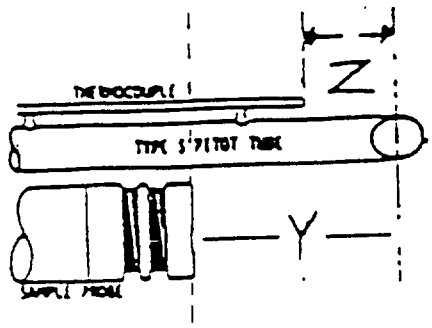
Y = 6.000 — Y ≥ 3.0"

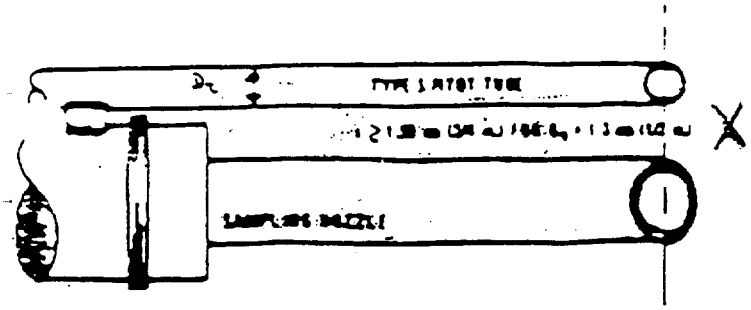
Z = 2.551 — Z > 2.0"

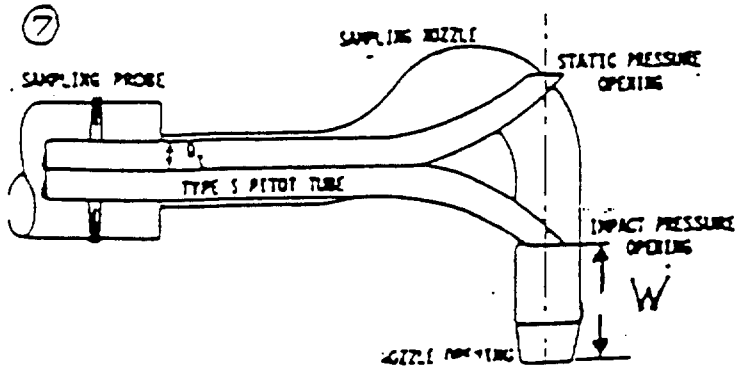
D_t = .374 — D_t > .1875"

④ 

(γ, θ EXPRESSED IN DEGREES)

⑥ 

⑤ 

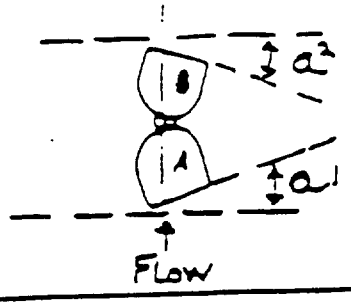
⑦ 

GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check

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

D

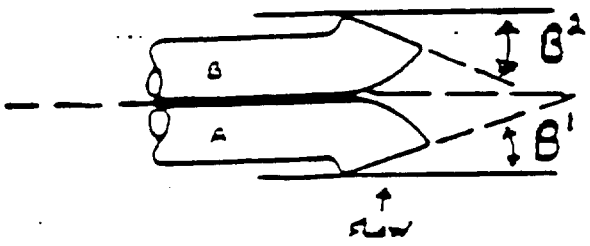


a^1 = 1°
a^2 = 2°
$a^1, a^2 = <10°$

B^1 = 1°
B^2 = 1°
$B^1, B^2 = <5°$

F = 1.50"

②



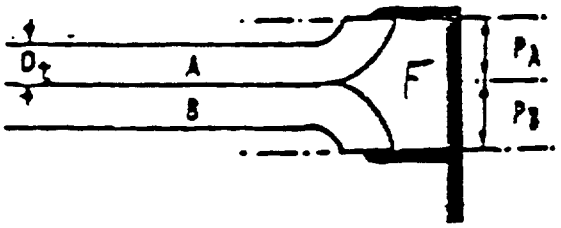
μ = 0 — μ = ≤ 0.1250" ($\mu = F \tan \gamma$)

V = 0 — V = ≤0.03125" ($V = F \tan \theta$)

W = .25 — W ≥ 0"

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

③



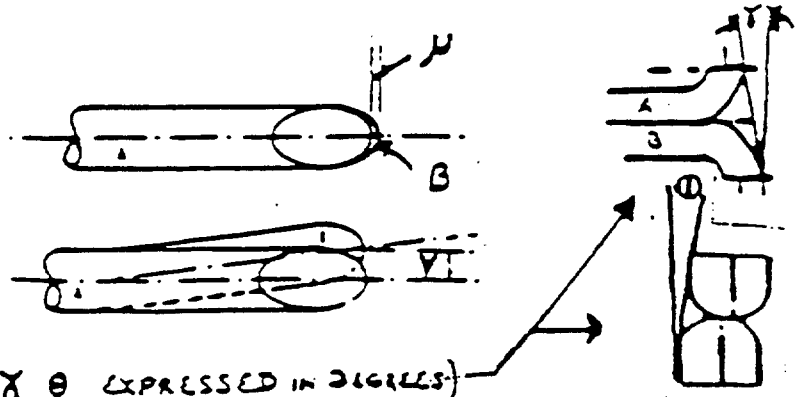
$1.05\ D_t < A < 1.50\ D_t$
$P_A = P_B$
$2.10\ D_t < A < 3.00\ D_t$

Y = 6.10" — Y ≥ 3.0"

Z = 2.6 — Z > 2.0"

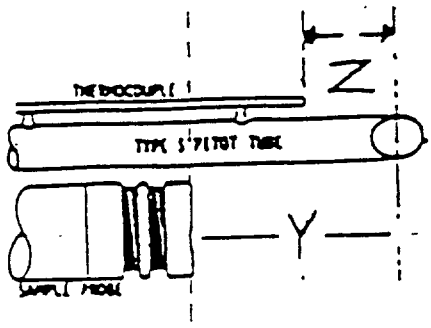
D_t = .390 — D_t > .1875"

④

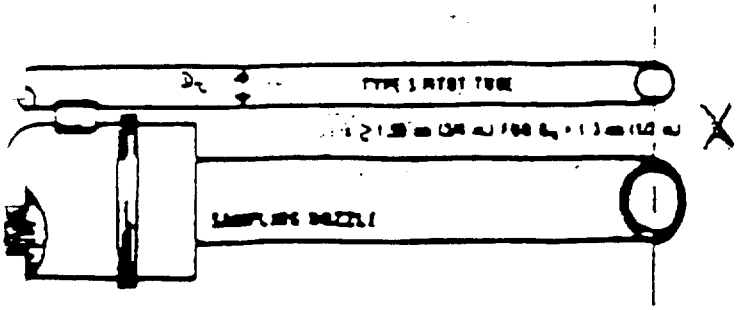


(γ, θ EXPRESSED IN DEGREES)

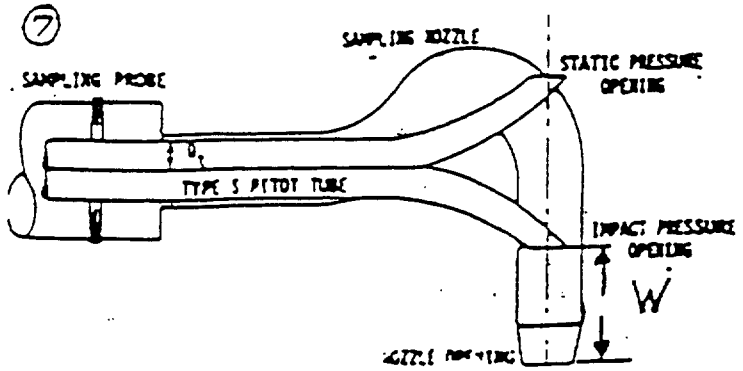
⑥



⑤



⑦



COMPLIANCE DEMONSTRATION
NO. 7 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX B

PLANT OPERATIONAL DATA

CHESTER
ENVIRONMENTAL

Tuesday, April 26, 1994 Turn 1
Batteries: 7-9_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
	B24/8	18:39	11:49pm	12:00am	12:11am
	B31/7	18:44	11:55pm	12:05am	12:16am
	A26/9	18:44	12:00am	12:11am	12:22am
4	B26/8	18:44	12:06am	12:17am	12:28am
5	A28/9	18:44	12:12am	12:23am	12:34am
	B28/8	18:44	12:18am	12:29am	12:40am
	A30/9	18:44	12:24am	12:35am	12:46am
	B30/8	18:43	12:29am	12:42am	12:51am
	C1 /8	18:44	12:35am	12:46am	12:57am
10	B1 /9	18:44	12:41am	12:52am	1:03am
	A1 /7	18:44	12:47am	12:58am	1:09am
	B3 /9	18:44	12:53am	1:04am	1:15am
	A3 /7	18:44	12:59am	1:10am	1:21am
	B5 /9	18:44	1:05am	1:16am	1:27am
	A5 /7	18:43	1:10am	1:21am	1:32am
	B7 /9	18:44	1:16am	1:27am	1:38am
	A7 /7	18:44	1:22am	1:33am	1:44am
	B9 /9	18:44	1:28am	1:39am	1:50am
	A9 /7	18:44	1:34am	1:45am	1:56am
	B11/9	18:44	1:40am	1:51am	2:02am
	A11/7	18:44	1:46am	1:57am	2:08am
	B13/9	18:43	1:51am	2:02am	2:13am
	A13/7	18:44	1:57am	2:08am	2:19am
	B15/9	18:44	2:03am	2:14am	2:25am
	A15/7	18:44	2:09am	2:20am	2:31am
	B17/9	18:44	2:15am	2:26am	2:37am
	A17/7	18:44	2:21am	2:32am	2:43am
	B19/9	18:44	2:27am	2:38am	2:49am
	A19/7	18:43	2:32am	2:43am	2:54am
	B21/9	18:43	2:38am	2:49am	3:00am
	A21/7	18:43	2:44am	2:55am	3:06am
	B23/9	18:43	2:50am	3:01am	3:12am
	A23/7	18:43	2:56am	3:07am	3:18am
	B25/9	18:43	3:02am	3:13am	3:24am
	A25/7	18:43	3:08am	3:19am	3:30am
	B27/9	18:43	3:13am	3:24am	3:35am
	A27/7	18:42	3:19am	3:30am	3:41am
	B29/9	18:42	3:25am	3:36am	3:47am
	A29/7	18:42	3:31am	3:42am	3:53am
	B31/9	18:42	3:37am	3:48am	3:59am
	A31/7	18:42	3:43am	3:54am	4:05am
	C2 /9	18:41	3:48am	3:59am	4:10am
	A2 /9	18:41	3:54am	4:05am	4:16am
	B2 /7	18:41	4:00am	4:11am	4:22am
	A4 /8	18:41	4:06am	4:17am	4:28am
	B4 /7	18:41	4:12am	4:23am	4:34am
	A6 /8	18:41	4:18am	4:29am	4:40am
	B6 /7	18:41	4:24am	4:35am	4:46am
	A8 /8	18:40	4:29am	4:40am	4:51am
	B8 /7	18:40	4:35am	4:46am	4:57am
	A10/8	18:40	4:41am	4:52am	5:03am
	B10/7	18:40	4:47am	4:58am	5:09am
	A12/8	18:40	4:53am	5:04am	5:15am
	B12/7	18:40	4:59am	5:10am	5:21am
	A14/8	18:40	5:05am	5:16am	5:27am
	B14/7	18:39	5:10am	5:21am	5:32am
	A16/8	18:39	5:16am	5:27am	5:38am
	B16/7	18:39	5:22am	5:33am	5:44am
	A18/8	18:39	5:28am	5:39am	5:50am
	B18/7	18:39	5:34am	5:45am	5:56am
	A20/8	18:39	5:40am	5:51am	6:02am
	B20/7	18:39	5:46am	5:57am	6:08am
	A22/8	18:38	5:51am	6:02am	6:13am
	B22/7	18:38	5:57am	6:08am	6:19am
	A24/8	18:38	6:03am	6:14am	6:25am
	B24/7	18:38	6:09am	6:20am	6:31am
	A26/8	18:38	6:15am	6:26am	6:37am
	B26/7	18:38	6:21am	6:32am	6:43am
	A28/8	18:37	6:27am	6:38am	6:49am
	B28/7	18:37	6:32am	6:43am	6:54am
	A30/8	18:37	6:38am	6:49am	7:00am
	B32/7	158:55	[illegible]	[illegible]	7:06am
	[illegible] /9	158:55	[illegible]	[illegible]	7:12am
	[illegible] /8	158:55	[illegible]	[illegible]	7:18am
	[illegible] /9	158:55	[illegible]	[illegible]	7:24am
	[illegible] /8	158:55	[illegible]	[illegible]	7:30am
	[illegible] /9	158:55	[illegible]	[illegible]	7:35am
	[illegible] /8	158:54	[illegible]	[illegible]	7:41am
	[illegible] /9	158:54	[illegible]	7:36am	7:47am
	E7 /8	158:54	[illegible]	7:42am	7:53am

+ B-31/7 A B-24/8

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

Tuesday, April 26, 1994 Turn 1
Batteries: 7-9_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
	A9 /9	158:54	7:37am	7:48am	7:59am
	B9 /8	18:36	7:43am	7:54am	8:05am

PUSHING SCHEDULE

Tuesday, April 26, 1994 Turn 2
Batteries: 7-9_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
	A11/9	150:54	7:45am	8:00am	8:15am
	B11/8	150:54	7:51am	8:06am	8:21am
	A13/9	150:54	7:57am	8:12am	8:27am
	B13/8	150:54	8:03am	8:18am	8:33am
	A15/9	150:54	8:09am	8:24am	8:39am
	B15/8	150:54	8:15am	8:30am	8:45am
	A17/9	150:54	8:21am	8:36am	8:51am
	B17/8	150:54	8:27am	8:42am	8:57am
	A19/9	150:54	8:33am	8:48am	9:03am
	B19/8	150:54	8:39am	8:54am	9:09am
	A21/9	150:54	8:45am	9:00am	9:15am
	B21/8	150:54	8:51am	9:06am	9:21am
	A23/9	150:48	8:57am	9:12am	9:27am
	B23/8	150:48	9:03am	9:18am	9:33am
	A25/9	150:48	9:09am	9:24am	9:39am
	B25/8	150:48	9:15am	9:30am	9:45am
	A27/9	150:48	9:21am	9:36am	9:51am
	B27/8	150:48	9:27am	9:42am	9:57am
	A29/9	150:48	9:33am	9:48am	10:03am
	B29/8	150:48	9:39am	9:54am	10:09am
	A31/9	150:48	9:45am	10:00am	10:15am
	B31/8	150:48	9:51am	10:06am	10:21am
	C2 /8	150:42	9:57am	10:12am	10:27am
	B2 /9	150:42	10:03am	10:18am	10:33am
	A2 /7	150:42	10:09am	10:24am	10:39am
	B4 /9	150:42	10:15am	10:30am	10:45am
	A4 /7	19:36	10:21am	10:36am	10:51am
	B6 /9	19:37	10:27am	10:42am	10:57am
	A6 /7	19:37	10:33am	10:48am	11:03am
	B8 /9	19:37	10:39am	10:54am	11:09am
	A8 /7	19:37	10:45am	11:00am	11:15am
	B10/9	19:37	10:51am	11:06am	11:21am
	A10/7	19:37	10:57am	11:12am	11:27am
	B12/9	19:37	11:03am	11:18am	11:33am
	A12/7	19:37	11:09am	11:24am	11:39am
	B14/9	19:37	11:15am	11:30am	11:45am
	A14/7	19:37	11:21am	11:36am	11:51am
	B16/9	19:37	11:27am	11:42am	11:57am
	A16/7	19:37	11:33am	11:48am	12:03pm
	B18/9	19:37	11:39am	11:54am	12:09pm
	A18/7	19:38	11:45am	12:00pm	12:15pm
	B20/9	19:38	11:51am	12:06pm	12:21pm
	A20/7	19:38	11:57am	12:12pm	12:27pm
	B22/9	19:38	12:03pm	12:18pm	12:33pm
	A22/7	19:38	12:09pm	12:24pm	12:39pm
	B24/9	19:38	12:15pm	12:30pm	12:45pm
	A24/7	19:39	12:21pm	12:36pm	12:51pm
	B26/9	19:38	12:27pm	12:42pm	12:57pm
	A26/7	19:38	12:33pm	12:48pm	1:03pm
	B28/9	19:38	12:39pm	12:54pm	1:09pm
	A28/7	19:39	12:45pm	1:00pm	1:15pm
	B30/9	19:39	12:51pm	1:06pm	1:21pm
	C1 /9	19:39	12:57pm	1:12pm	1:27pm
	A30/7	19:39	1:03pm	1:18pm	1:33pm
	A1 /8	19:39	1:09pm	1:24pm	1:39pm
	B1 /7	19:39	1:15pm	1:30pm	1:45pm
	A3 /8	19:39	1:21pm	1:36pm	1:51pm
	B3 /7	19:39	1:27pm	1:42pm	1:57pm
	A5 /8	19:39	1:33pm	1:48pm	2:03pm
	B5 /7	19:39	1:39pm	1:54pm	2:09pm
	A7 /8	19:39	1:45pm	2:00pm	2:15pm
	A9 /8	19:39	1:51pm	2:06pm	2:21pm
	B9 /7	19:39	1:57pm	2:12pm	2:27pm
	A11/8	19:39	2:03pm	2:18pm	2:33pm
	B11/7	19:39	2:09pm	2:24pm	2:39pm
	A13/8	19:39	2:15pm	2:30pm	2:45pm
	B13/7	19:39	2:21pm	2:36pm	2:51pm
	A15/8	19:40	2:27pm	2:42pm	2:57pm
	B15/7	19:40	2:33pm	2:48pm	3:03pm
	A17/8	19:40	2:39pm	2:54pm	3:09pm
	B17/7	19:42	2:45pm	3:00pm	3:15pm
	A19/8	19:40	2:51pm	3:06pm	3:21pm
	B19/7	19:40	2:57pm	3:12pm	3:27pm
	A21/8	19:40	3:03pm	3:18pm	3:33pm
	B21/7	19:40	3:09pm	3:24pm	3:39pm
	A23/8	19:40	3:15pm	3:30pm	3:45pm
	B23/7	19:40	3:21pm	3:36pm	3:51pm
	A25/8	19:40	3:27pm	3:42pm	3:57pm
	B25/7	19:40	3:33pm	3:48pm	4:03pm
	A27/8	19:40	3:39pm	3:54pm	4:09pm

-B 7/7

Tuesday, April 26, 1994 Turn 3
Batteries: 7-9_2

#	Oven	Last Pushed	Earliest	Desired	Latest
	B27/7	18:41	3:49pm	4:00pm	4:11pm
	A29/8	18:40	3:55pm	4:05pm	4:16pm
	B29/7	18:40	4:03pm	4:11pm	4:22pm
	A31/8	18:40	4:12pm	4:17pm	4:28pm
	B2 /8	18:40	4:17pm	4:23pm	4:33pm
	B2 /8	18:40	4:19pm	4:29pm	4:40pm
	A4 /9	18:40	4:24pm	4:35pm	4:46pm
	B4 /8	18:39	4:29pm	4:40pm	4:51pm
	A6 /9	18:39	4:36pm	4:46pm	4:57pm
	B6 /8	37:16	4:41pm	4:51pm	5:02pm
	A8 /9	37:16	4:47pm	4:57pm	5:08pm
	B8 /8	37:16	4:53pm	5:04pm	5:15pm
	A10/9	37:16	4:59pm	5:12pm	5:21pm
	B12/8	37:17	5:05pm	5:16pm	5:27pm
	A12/9	37:16	5:12pm	5:22pm	5:33pm
	B12/8	37:16	5:16pm	5:27pm	5:38pm
	A14/9	37:16	5:22pm	5:33pm	5:44pm
	B14/8	37:16	5:28pm	5:39pm	5:50pm
	A16/9	37:16	5:34pm	5:45pm	5:56pm
	B16/8	37:16	5:40pm	5:51pm	6:02pm
	A18/9	37:17	5:46pm	5:57pm	6:08pm
	B19/8	37:16	5:51pm	6:02pm	6:13pm
	A20/9	37:16	5:57pm	6:08pm	6:19pm
	B22/8	37:16	6:03pm	6:14pm	6:25pm
	A22/9	37:16	6:09pm	6:20pm	6:31pm
	B22/8	37:16	6:15pm	6:26pm	6:37pm
	A24/9	37:16	6:21pm	6:32pm	6:43pm
	B24/8	18:39	6:27pm	6:38pm	6:49pm
	A26/9	18:32	6:34pm	6:44pm	6:55pm
	B26/8	18:32	6:40pm	6:50pm	7:01pm
	A28/9	18:32	6:44pm	6:55pm	7:06pm
	B28/8	18:32	6:52pm	7:02pm	7:13pm
	A30/9	18:32	6:58pm	7:08pm	7:19pm
	B30/8	18:32	7:04pm	7:14pm	7:25pm
	C1 /8	18:32	7:10pm	7:20pm	7:31pm
	C1 /9	18:32	7:16pm	7:26pm	7:37pm
	A1 /7	18:32	7:22pm	7:32pm	7:43pm
	C3 /7	18:32	7:28pm	7:38pm	7:49pm
	C3 /9	18:32	7:34pm	7:44pm	7:55pm
	C5 /7	18:32	7:40pm	7:50pm	8:01pm
	A5 /7	18:32	7:46pm	7:56pm	8:07pm
	C7 /9	18:32	7:52pm	8:02pm	8:13pm
	A7 /7	18:32	7:58pm	8:08pm	8:19pm
	C9 /9	18:32	8:04pm	8:14pm	8:25pm
	A9 /7	18:32	8:10pm	8:20pm	8:31pm
	C11/9	18:32	8:15pm	8:26pm	8:37pm
	A11/7	18:32	8:21pm	8:31pm	8:42pm
	C13/9	18:32	8:27pm	8:37pm	8:48pm
	A13/7	18:32	8:33pm	8:43pm	8:54pm
	C15/9	18:32	8:39pm	8:49pm	9:00pm
	A15/7	18:32	8:45pm	8:55pm	9:06pm
	C17/9	18:32	8:51pm	9:01pm	9:12pm
	A17/7	18:32	8:57pm	9:07pm	9:18pm
	C19/9	18:32	9:03pm	9:13pm	9:24pm
	A19/7	18:32	9:09pm	9:19pm	9:30pm
	C21/9	18:32	9:15pm	9:25pm	9:36pm
	A21/7	18:32	9:21pm	9:31pm	9:42pm
	C23/9	18:32	9:27pm	9:37pm	9:48pm
	A23/7	18:32	9:34pm	9:45pm	9:56pm
	C25/9	18:32	9:40pm	9:51pm	10:02pm
	A25/7	18:32	9:46pm	9:57pm	10:08pm
	C27/9	18:32	9:51pm	12:22am	10:13pm
	A27/7	18:32	9:57pm	12:28am	10:19pm
	C29/9	18:32	12:03am	12:34am	10:25pm
	A29/7	18:32	12:09am	12:40am	10:31pm
	C31/9	18:32	12:15am	12:46am	10:37pm
	A31/7	18:32	12:21am	12:52am	10:43pm
	C2 /9	18:32	12:27am	12:58am	10:49pm
	A2 /8	18:32	12:33am	1:04am	10:55pm
	C4 /7	18:32	12:39am	1:10am	11:01pm
	A4 /8	18:32	12:45am	1:16am	11:07pm
	C6 /9	18:32	12:51am	1:22am	11:13pm
	A6 /7	18:32	12:57am	1:28am	11:19pm
	C8 /9	18:32	1:03am	1:34am	11:25pm
	A8 /7	18:32	1:09am	1:40am	11:31pm
	C10/9	18:32	1:15am	1:46am	11:37pm
	A10/7	18:32	1:21am	1:52am	11:43pm
	C12/8	18:32	1:27am	1:58am	11:49pm

- B31-7

B7-7

WA1-7

PUSHING SCHEDULE

Tuesday, April 26, 1994 Turn 3
Batteries: 7-9_2

#	Oven	Last Pushed	Earliest	Desired	Latest
1	B12/7	18:39	11:37pm	11:48pm	11:55pm
2	A14/8	18:38	11:43pm	11:54pm	12:03am

Wednesday, April 27, 1994 Turn 1
Batteries: 7-9_2

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

+B-31/7 A B-14/7

PUSHING SCHEDULE

Wednesday, April 27, 1994 Turn 1
Batteries: 7-9_2

; #	Oven	Last Pushed	Earliest	Desired	Latest
	D1 /9	10:36	7:37am	7:49am	7:59am
	A30/7	10:28	7:42am	7:54am	8:05am

Wednesday, April 27, 1994 Turn 2
Batteries: 7-9_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	A1 /8	18:36	7:45am	8:00am	8:15am
2	B1 /7	18:36	7:51am	8:06am	8:21am
3	A3 /8	18:36	7:57am	8:12am	8:27am
4	B3 /7	18:36	8:03am	8:18am	8:33am
5	A5 /8	18:36	8:09am	8:24am	8:39am
6	B5 /7	18:36	8:15am	8:30am	8:45am
7	A7 /8	18:36	8:21am	8:36am	8:51am
8	A9 /8	18:36	8:27am	8:42am	8:57am
9	B9 /7	18:36	8:33am	8:48am	9:03am
10	A11/8	18:36	8:39am	8:54am	9:09am
11	B11/7	18:36	8:45am	9:00am	9:15am
12	A13/8	18:36	8:51am	9:06am	9:21am
13	B13/7	18:36	8:57am	9:12am	9:27am
14	A15/8	18:36	9:03am	9:18am	9:33am
15	B15/7	18:36	9:09am	9:24am	9:39am
16	A17/8	18:36	9:15am	9:30am	9:45am
17	B17/7	18:36	9:21am	9:36am	9:51am
18	A19/8	18:36	9:27am	9:42am	9:57am
19	B19/7	18:36	9:33am	9:48am	10:03am
20	A21/8	18:36	9:39am	9:54am	10:09am
21	B21/7	18:36	9:45am	10:00am	10:15am
22	A23/8	18:36	9:51am	10:06am	10:21am
23	B23/7	18:36	9:57am	10:12am	10:27am
24	A25/8	18:36	10:03am	10:18am	10:33am
25	B25/7	18:36	10:09am	10:24am	10:39am
26	A27/8	18:36	10:15am	10:30am	10:45am
27	B27/7	18:36	10:21am	10:36am	10:51am
28	A29/8	18:37	10:27am	10:42am	10:57am
29	B29/7	18:37	10:33am	10:48am	11:03am
30	A31/8	18:37	10:39am	10:54am	11:09am
31	A2 /9	18:37	10:45am	11:00am	11:15am
32	B2 /8	18:37	10:51am	11:06am	11:21am
33	A4 /9	18:37	10:57am	11:12am	11:27am
34	B4 /8	18:38	11:03am	11:18am	11:33am
35	A6 /9	18:38	11:09am	11:24am	11:39am
36	B6 /8	18:38	11:15am	11:30am	11:45am
37	A8 /9	18:38	11:21am	11:36am	11:51am
38	B8 /8	18:38	11:27am	11:42am	11:57am
39	A10/9	18:38	11:33am	11:48am	12:03pm
40	B10/8	18:38	11:39am	11:54am	12:09pm
41	A12/9	18:39	11:45am	12:00pm	12:15pm
42	B12/8	18:39	11:51am	12:06pm	12:21pm
43	A14/9	18:39	11:57am	12:12pm	12:27pm
44	B14/8	18:39	12:03pm	12:18pm	12:33pm
45	A16/9	18:39	12:09pm	12:24pm	12:39pm
46	B16/8	18:39	12:15pm	12:30pm	12:45pm
47	A18/9	18:39	12:21pm	12:36pm	12:51pm
48	B18/8	18:40	12:27pm	12:42pm	12:57pm
49	A20/9	18:40	12:33pm	12:48pm	1:03pm
50	B20/8	18:40	12:39pm	12:54pm	1:09pm
51	A22/9	18:40	12:45pm	1:00pm	1:15pm
52	B22/8	18:40	12:51pm	1:06pm	1:21pm
53	A24/9	18:40	12:57pm	1:12pm	1:27pm
54	B24/8	18:40	1:03pm	1:18pm	1:33pm
55	A26/9	18:41	1:09pm	1:24pm	1:39pm
56	B26/8	18:41	1:15pm	1:30pm	1:45pm
57	A28/9	18:41	1:21pm	1:36pm	1:51pm
58	B28/8	18:41	1:27pm	1:42pm	1:57pm
59	A30/9	18:41	1:33pm	1:48pm	2:03pm
60	B30/8	18:41	1:39pm	1:54pm	2:09pm
61	C1 /8	18:41	1:45pm	2:00pm	2:15pm
62	B1 /9	18:42	1:51pm	2:06pm	2:21pm
63	A1 /7	18:42	1:57pm	2:12pm	2:27pm
64	B3 /9	18:36	2:03pm	2:18pm	2:33pm
65	A3 /7	18:36	2:09pm	2:24pm	2:39pm
66	B5 /9	18:36	2:15pm	2:30pm	2:45pm
67	A5 /7	18:37	2:21pm	2:36pm	2:51pm
68	B7 /9	18:37	2:27pm	2:42pm	2:57pm
69	A7 /7	18:37	2:33pm	2:48pm	3:03pm
70	B9 /9	18:37	2:39pm	2:54pm	3:09pm
71	A9 /7	18:37	2:45pm	3:00pm	3:15pm
72	B11/9	18:37	2:51pm	3:06pm	3:21pm
73	A11/7	18:37	2:57pm	3:12pm	3:27pm
74	B13/9	18:38	3:03pm	3:18pm	3:33pm
75	A13/7	18:38	3:09pm	3:24pm	3:39pm
76	B15/9	18:38	3:15pm	3:30pm	3:45pm
77	A15/7	18:38	3:21pm	3:36pm	3:51pm
78	B17/9	18:38	3:27pm	3:42pm	3:57pm
79	A17/7	18:44	3:33pm	3:48pm	4:03pm
80	B19/9	18:50	3:39pm	3:54pm	4:09pm

- 8 7/7 - 8 31/7

PUSHING SCHEDULE

Wednesday, April 27, 1994 Turn 3
Batteries: 7-9_2

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

PUSHING SCHEDULE

Wednesday, April 27, 1994 Turn 3
Batteries: 7-9_2

eq #	Oven	Last Pushed	Earliest	Desired	Latest
81	A4 /7	18:32	11:37pm	11:48pm	11:59pm
82	B6 /9	18:33	11:43pm	11:54pm	12:05am

CC-10285 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 4/26/94

BATTERY NO. B's 8

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	6	19	6	44	
3	6	35	7	00	
5	6	46	7	13	
7	7	02	8	15	
9	7	15	8	28	
11	8	18	8	40	
13	8	30	8	52	
15	8	42	9	04	
17	8	55	9	16	
19	9	06	9	28	
21	9	18	9	40	
23	9	30	9	52	
25	9	42	10	04	
27	9	55	10	16	
29	10	06	10	28	
31	10	18	10	40	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20			12	11	
22			12	16	
24	12	13	12	26	
26	12	19	12	36	
28	12	29	12	42	
30	12	38	12	52	
<1	12	44	1	03	
<2	10	30	10	52	

REMARKS: 22/24

BATTERY NO. A's 7

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	12	54	1	13	
3	1	05	1	22	
5	1	15	1	33	
7	1	24	1	42	
9	1	35	1	57	
11	1	44	2	03	
13	1	56	2	12	
15	2	05	2	22	
17	2	15	2	33	
19	2	24	2	44	
21	2	35	2	55	
23	2	46	3	01	
25	2	57	3	12	
27	3	03	3	27	
29	3	14	3	39	
31	3	29	3	50	
2	10	42	11	04	
4	10	55	11	16	
6	11	06	11	28	
8	11	18	11	40	
10	11	30	11	52	
12	11	42			
14	11	55			
16					
18					
20					
22					
24					
26					
28					
30					
1	—	—	—	—	
2	—	—	—	—	

23/21

BATTERY NO. B's 7

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
18					
21					
23					
25					
27					
29					
31	12	02	12	00	
2	3	41	4	00	
4	3	52	4	14	
6	4	02	4	20	
8	4	16	4	32	
10	4	22	4	42	
12	4	34	4	54	
14	4	44	5	05	
16	4	55	5	14	
18	5	07	5	25	
20	5	16	5	35	
22	5	27	5	44	
24	5	37	5	55	
26	5	46	6	05	
28	5	57	6	17	
30	6	07	6	31	
1	—	—	—	—	
2	—	—	—	—	

16/16

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	7	7	
1-2	6	6	
2-3	6	6	
3-4	5	5	
4-5	6	6	
5-6	6	6	
	36	36	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	4	4	
7-8	2	2	
8-9	4	4	
9-10	5	5	
10-11	5	5	
11-12	5	5	
	25	25	

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. _____
12 Hrs. Beginning 12:00 P M
Date 04-26-94

BATTERY NO. B 5-8					
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	35	4	55	
4	4	47	5	10	
6	4	57	5	20	
8	5	12	5	38	
10	5	22	5	50	
12	5	32	6	10	
14	5	42	6	25	
16	5	52	6	39	
18	6	05	6	58	
20	6	15	7	10	
22	6	27	7	26	
24	6	37	7	44	
26	6	47	7	50	
28	7	02	7	58	
30	7	12	8	12	
C1	7	22	8	24	
2					

BATTERY NO. A 5-7					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	7	33	8	37	
3	8	04	8	43	
5	8	10	8	53	
7	8	20	9	10	
9	8	35	9	17	
11	8	45	9	35	
13	8	56	9	46	
15	9	06	9	56	
17	9	16	10	03	
19	9	26	10	12	
21	9	38	10	20	
23	9	48	10	30	
25	9	58	10	40	
27	10	10	10	47	
29	10	23	10	53	
31	10	32	11	04	
2					
4					
6					
8					
10					
12			12	04	
14			12	16	
16	12	06	12	28	
18	12	18	12	[illegible]	
20	12	30	12	52	
22	[illegible]		1	04	
24	12	55	1	14	
26	1	06	1	24	
28	1	16	1	34	
30	1	26	1	44	
1					
2					

BATTERY NO. B 5-7					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	1	36	1	54	
3	1	46	2	04	
5	1	56	2	14	
7	2	47	2	[illegible]	X
9	2	06	2	24	
11	2	16	2	34	
13	2	26	2	44	
15	2	36	2	54	
17	[illegible]		3	07	
19	[illegible]		3	18	
21	3	00	3	31	
23	3	21	3	38	
25	3	34	3	45	
27	4	13	4	27	
29	4	24	4	37	
31	—	—	—	—	
2	10	50	11	14	
4	11	01	11	23	
6	11	12	11	33	
8	11	21	11	43	
10	11	31			
12	11	40			
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	5	
1-2	6	6	
2-3	6	6	
3-4	3	5	
4-5	5	3	
5-6	5	4	
	30	29	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	5	4	
7-8	5	5	
8-9	6	5	
9-10	6	6	
10-11	4	7	
11-12	5	5	
	31	32	

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 PM

Date 4/27/94

BATTERY NO. B's 5

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	8 33	8 59	
3	8 43	9 07	
5	8 54	9 17	
7	9 05	9 29	
9	9 15	9 38	
11	9 27	9 48	
13	9 41	9 55	
15	9 52	10 10	
17	10 05	10 17	
19	10 15	10 27	
21	10 25	10 39	
23	10 37	10 50	
25	10 47	11 00	
27	10 56	11 12	
29	11 04	11 22	
31	11 10	11 28	
2			
4			
6		12 09	
8	12 01	12 21	
10	12 12	12 32	
12	12 24	12 43	
14	12 35	12 54	
16	12 46	1 05	
18	12 57	1 16	
20	1 08	1 27	
22	1 19	1 37	
24	1 30	1 48	
26	1 40	1 58	
28	1 57	2 04	
30	2 01	2 16	
C1	2 07	2 27	
C2	11 16	11 42	

BATTERY NO. A's 7

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	2 19	2 38	
3	2 30	2 49	
5	2 41	3 00	
7	2 52	3 11	
9	3 02	3 21	
11	3 14	3 32	
13	3 24	3 43	
15	3 35	4 09	
17	3 46	4 20	
19	4 07	4 27	
21	4 18	4 35	
23	4 24	4 53	
25	4 37	5 04	
27	4 55	5 16	
29	5 06	5 39	
31	5 18	5 44	
2	11 38		
4	11 48		
6			
8			
10			
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
1	-	-	
2	-	-	

BATTERY NO. B's 7

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 36	5 48	
4	5 46	5 58	
6	5 56	6 10	
8	6 08	6 22	
10	6 19	6 34	
12	6 31	6 45	
14	6 42	6 55	
16	6 52	7 05	
18	7 03	7 17	
20	7 15	7 28	
22	7 26	7 40	
24	7 37	7 52	
26	7 50	8 05	
28	8 03	8 38	
30	8 15	8 48	
1	-	-	
2	-	-	

REMARKS:

30/31 — 16/16 — 15/15

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	6	5	
1-2	5	6	
2-3	6	5	
3-4	5	5	
4-5	5	5	
5-6	5	6	
	32	32	

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

Total Ovens Pushed 63

Total Ovens Charged 62

Pusherman

Battery Foreman

CC-10295 REV. 1181
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 M.

Date 4-27-94

BATTERY NO. B'S 8					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	2	05	2	51	
3	2	43	3	02	
5	2	53	3	10	
7	3	04	3	21	
9	3	12	3	31	
11	3	23	3	40	
13	3	32	3	49	
15	3	42	3	53	
17	3	51	4	01	
19	3	55	4	06	
21	4	03	4	36	
23	4	08	4	48	
25	4	38	4	57	
27	4	50	5	07	
29	4	59	5	12	
31	5	09	5	25	
2	11	28	11	46	
4	11	38	11	59	
6	11	49			
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
C1					
C2	5	14	5	36	

BATTERY NO. A'S 7					
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	27	5	45	HP+PB
4	5	39	5	54	PB
6	5	47	6	04	
8	5	56	6	15	
10	6	08	6	24	
12	6	17	6	33	
14	6	26	6	45	PB
16	6	35	6	52	
18	6	47	7	05	
20	6	54	7	14	
22	7	07	7	25	
24	7	16	7	35	
26	7	27	7	45	
28	7	37	7	49	
30	7	47	7	51	
1	—	—	—	—	
2	—	—	—	—	

BATTERY NO. B'S 7					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	8	11	8	27	
3	8	21	8	33	
5	8	31	8	48	
7					Pass Up
9	8	46	9	06	
11	8	59	9	23	
13	9	10	9	33	
15	9	25	9	50	
17	9	53	10	01	
19	10	04	10	19	
21	10	17	10	37	
23	10	35	10	45	
25	10	50	11	00	
27	11	02	11	11	
29	11	14	11	25	
31	12	03	12	10	
2					
4					
6					
8					
10			12	12	
12			12	16	
14	12	14	12	28	PB
16	12	19	12	37	
18	12	30	12	46	
20	12	39	12	55	
22	12	48	1	05	
24	12	57	1	16	
26	1	07	1	25	
28	1	18	2	03	
30	1	27	2	41	
1	—	—	—	—	
2	—	—	—	—	

REMARKS: 20 / 19 15 / 15 24 / 26

59 / 60

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	7	7	
1-2	3	3	
2-3	3	3	
3-4	7	7	
4-5	5	5	
5-6	6	6	
	31	31	

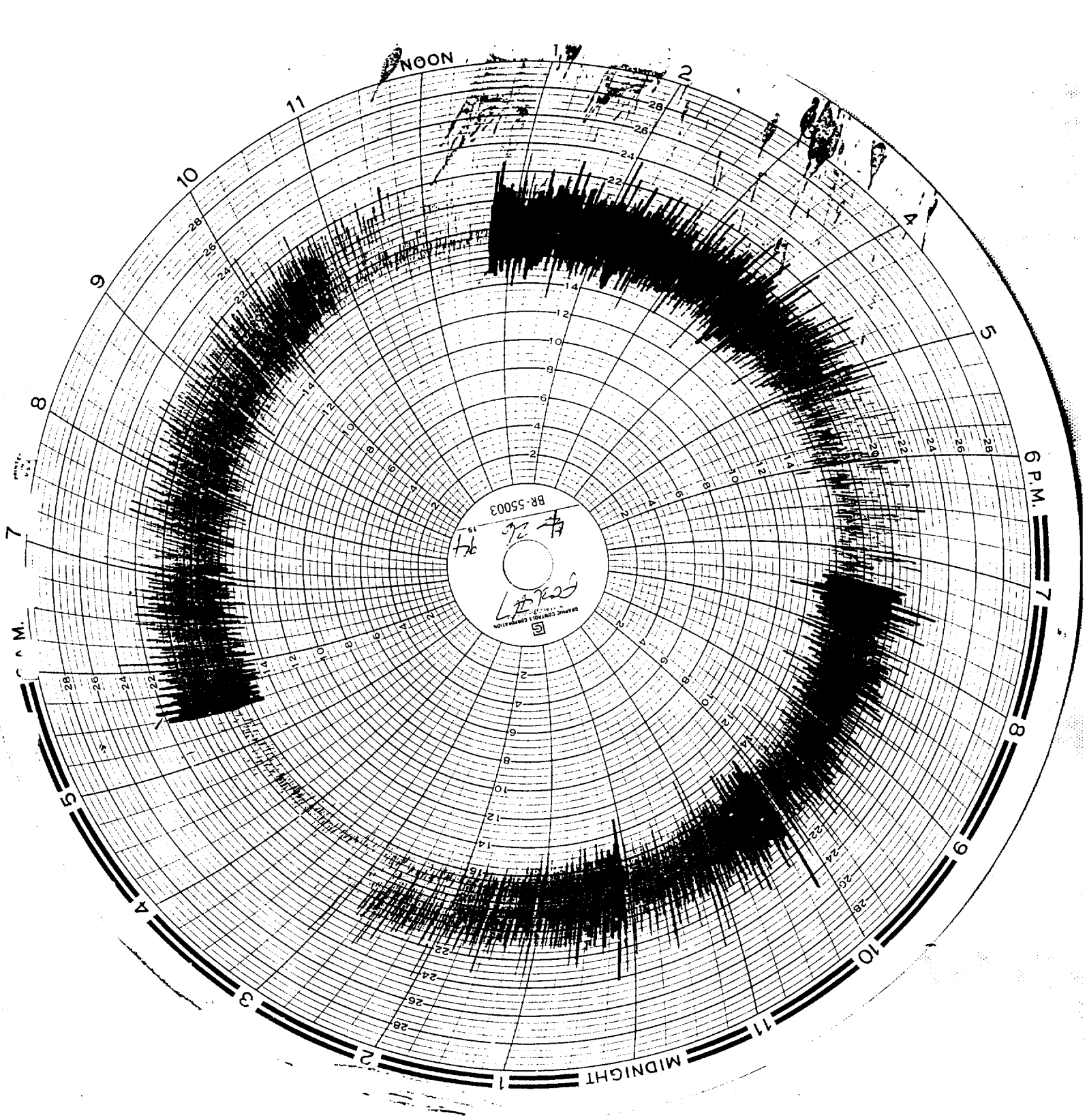
TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	6	6	
7-8	5	7	
8-9	5	3	
9-10	3	4	
10-11	4	4	
11-12	5	5	
	28	29	

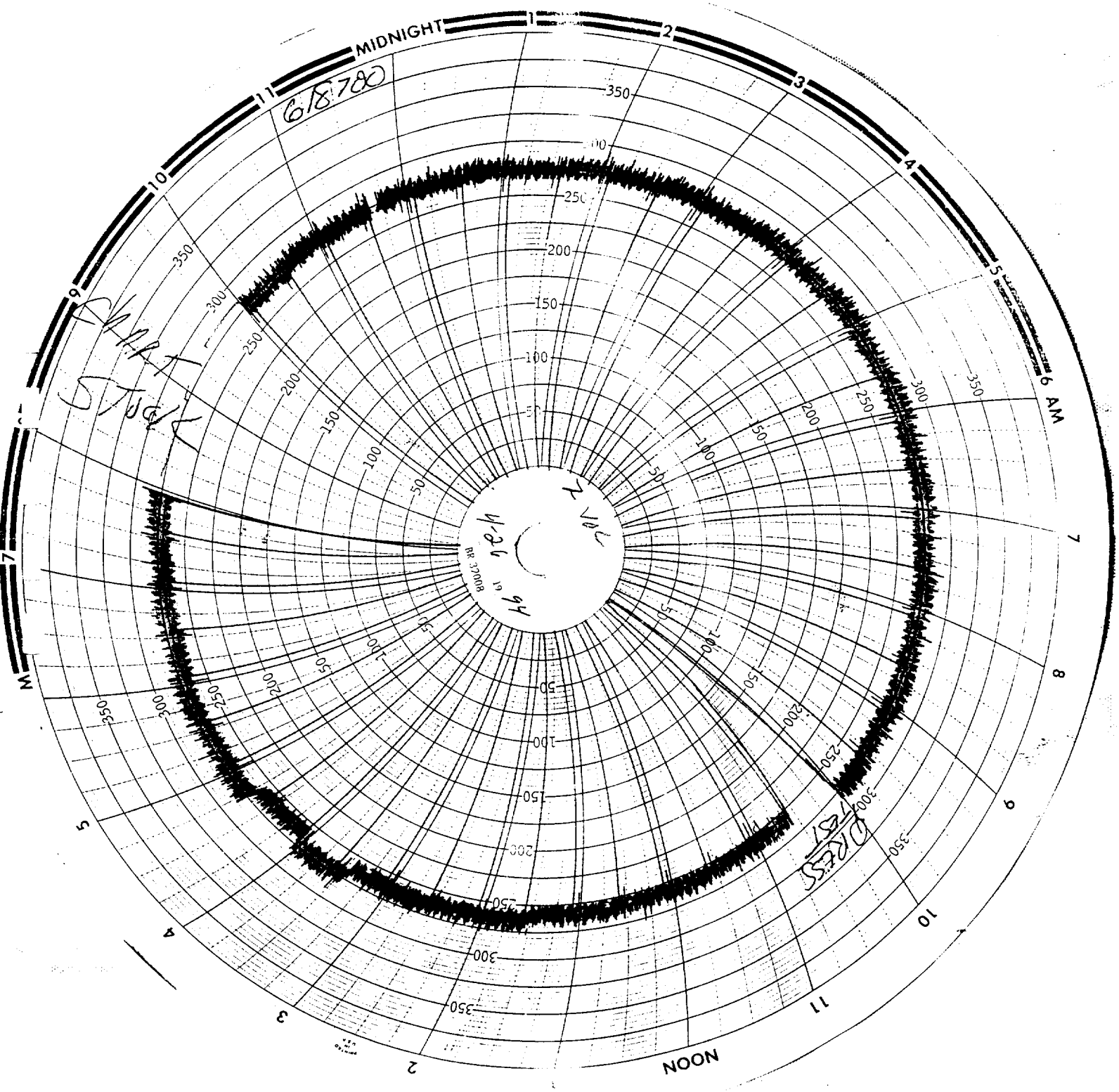
Total Ovens Pushed 59

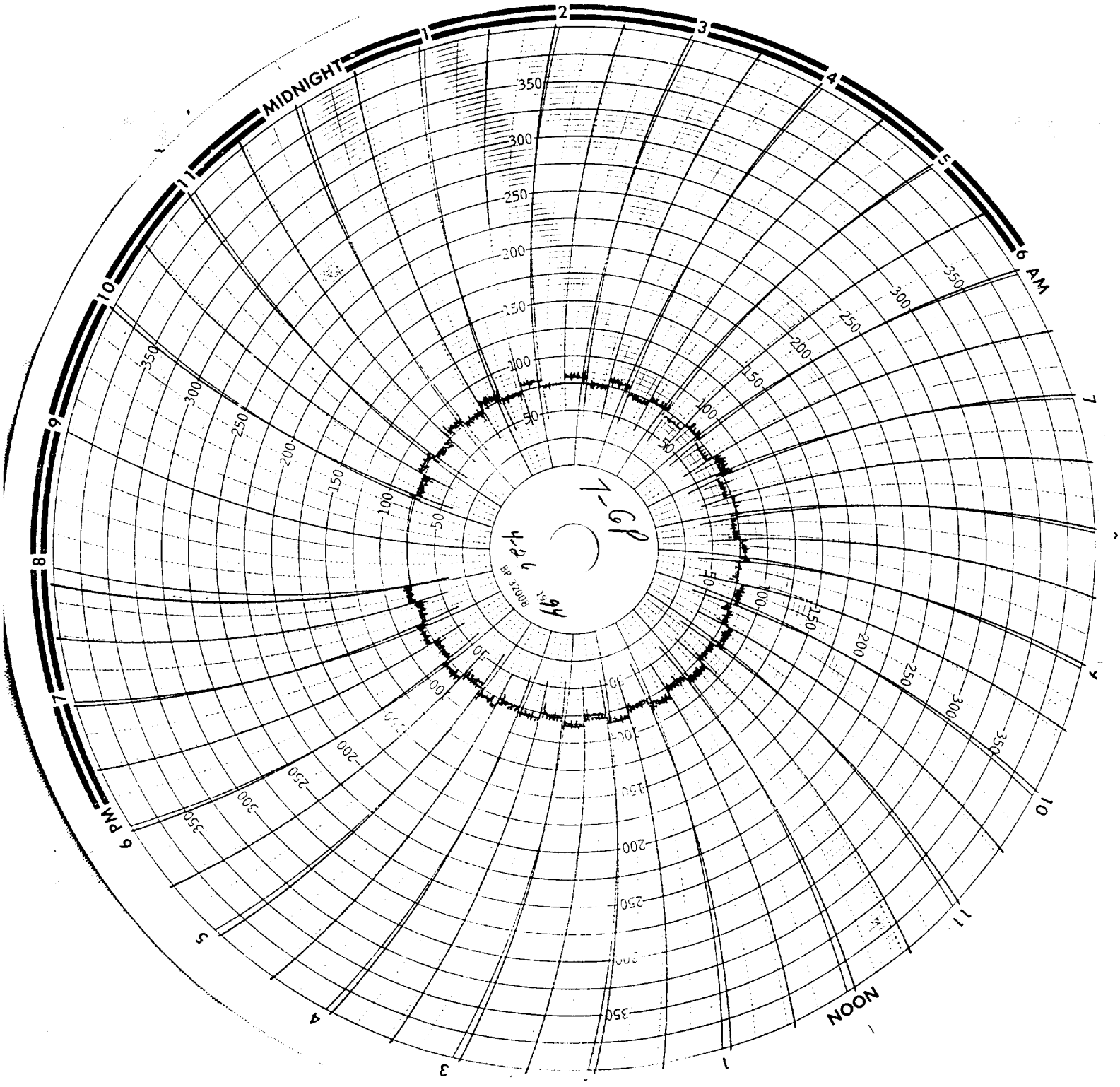
Total Ovens Charged 60

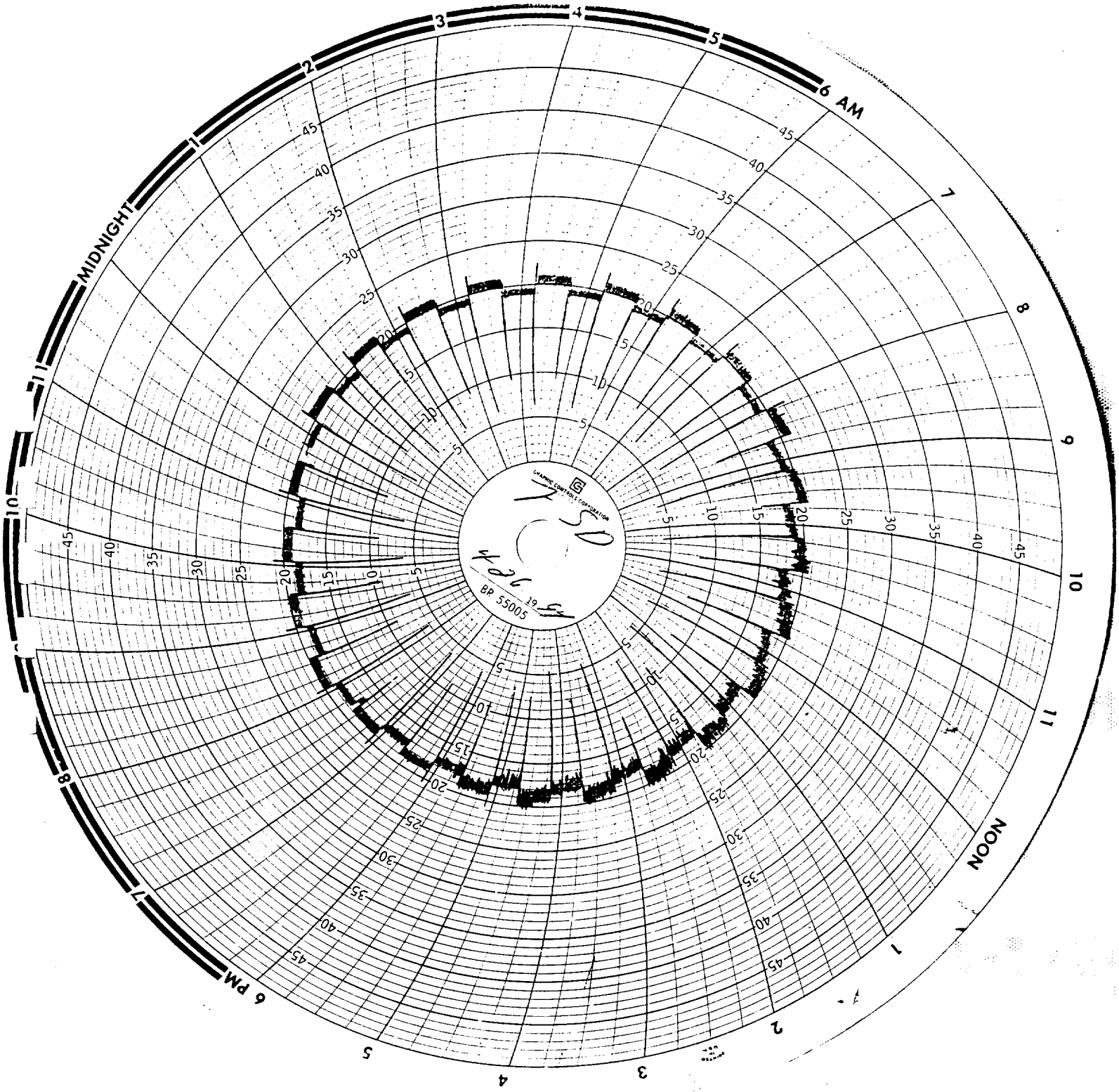
Pusherman

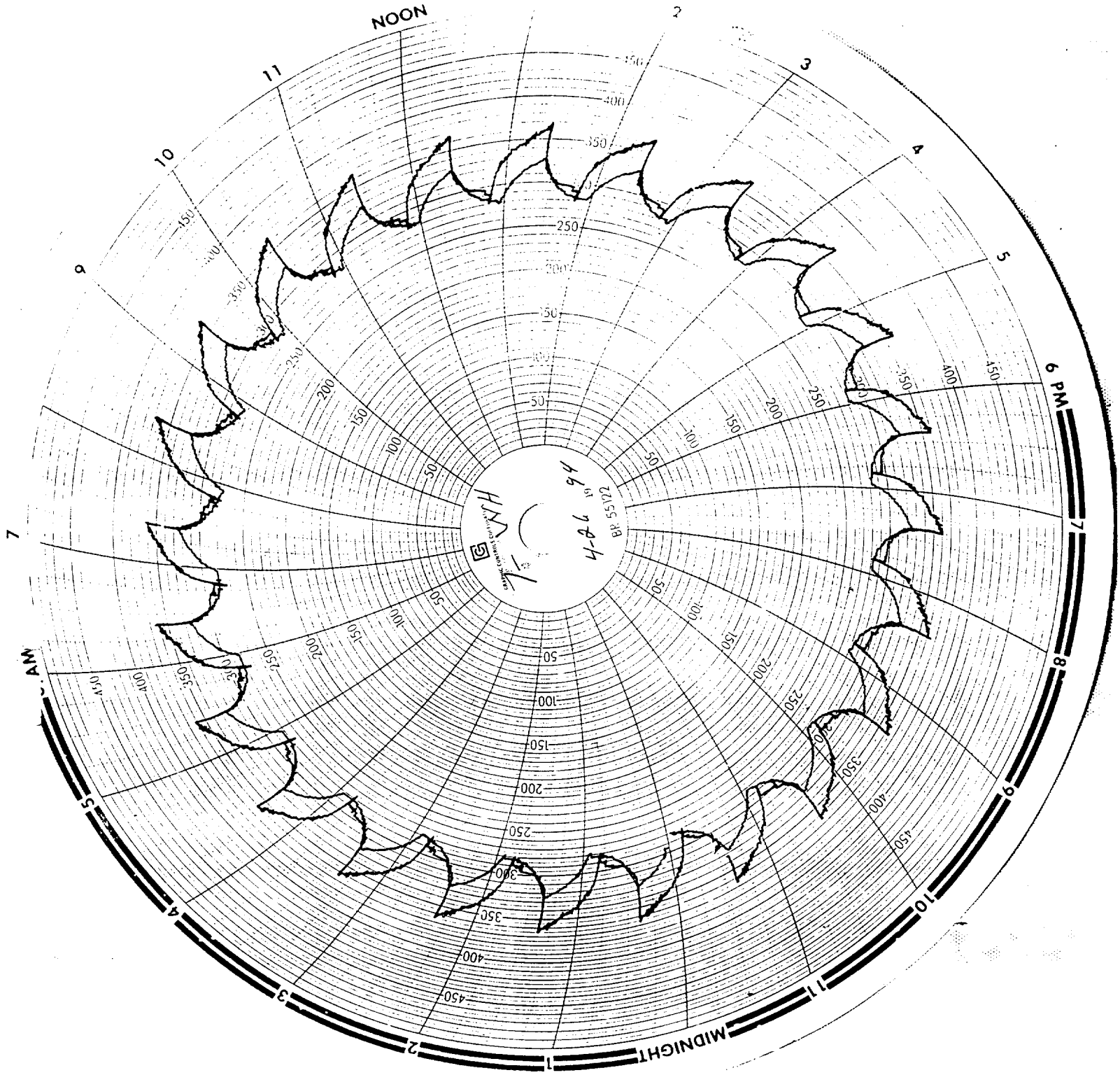
Battery Foreman

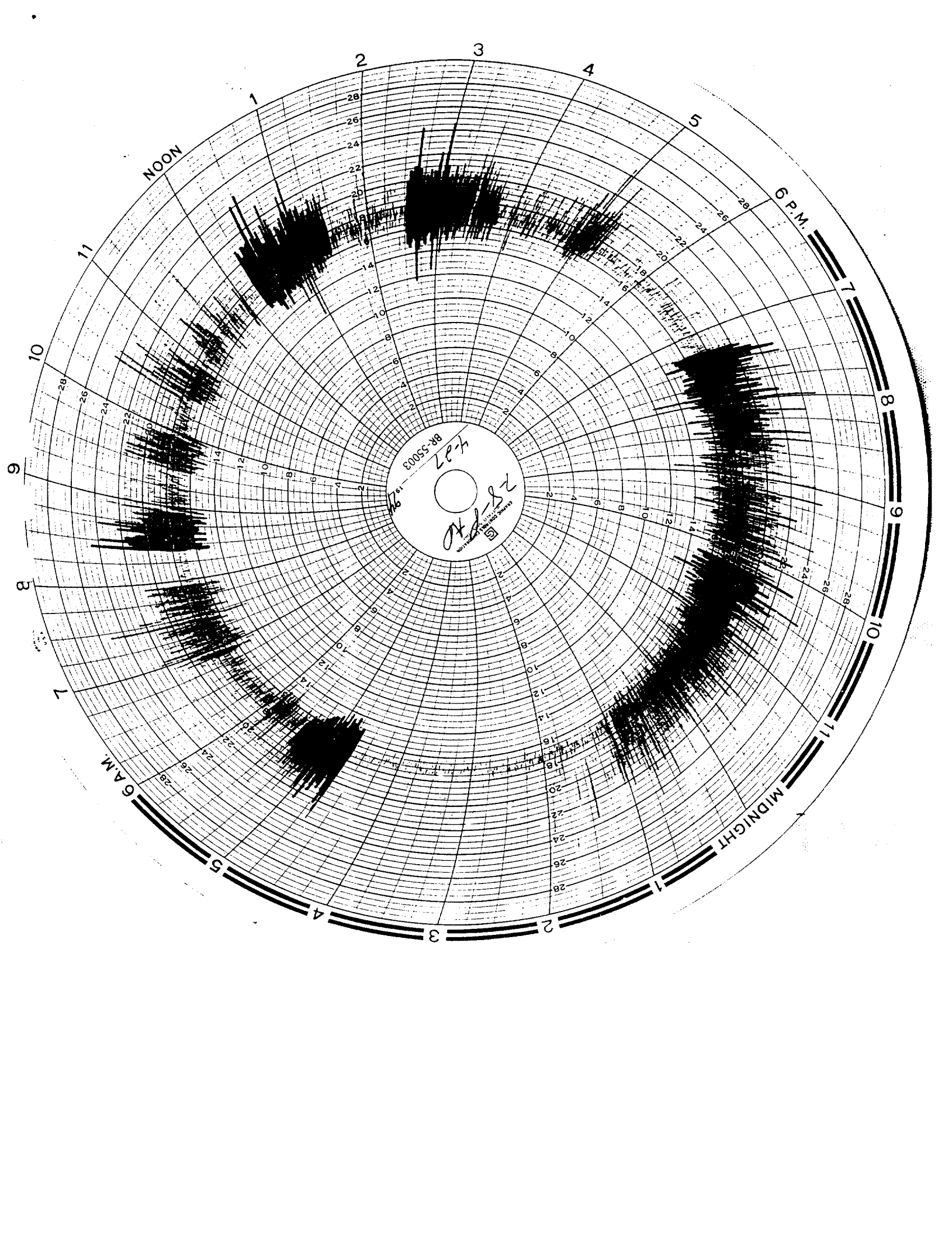

NOON
1
2
4
5
6 P.M.
7
8
9
10
11
MIDNIGHT
1
2
3
4
5
6
7
8
9
10
11
A.M.
BR-55003


MIDNIGHT
NOON
6 AM
4-26 94
BR 32008
DRESS TEST


MIDNIGHT
6 AM
NOON
6 PM
1
2
3
4
5
6
7
8
9
10
11
50
100
150
200
250
300
350


MIDNIGHT
6 AM
NOON
6 PM
GRAPHIC CONTROLS CORPORATION
BP 55005


NOON
MIDNIGHT
6 PM
AM
4-26 94
BR 55122


NOON
1
2
3
4
5
6 P.M.
7
8
9
10
11
MIDNIGHT
1
2
3
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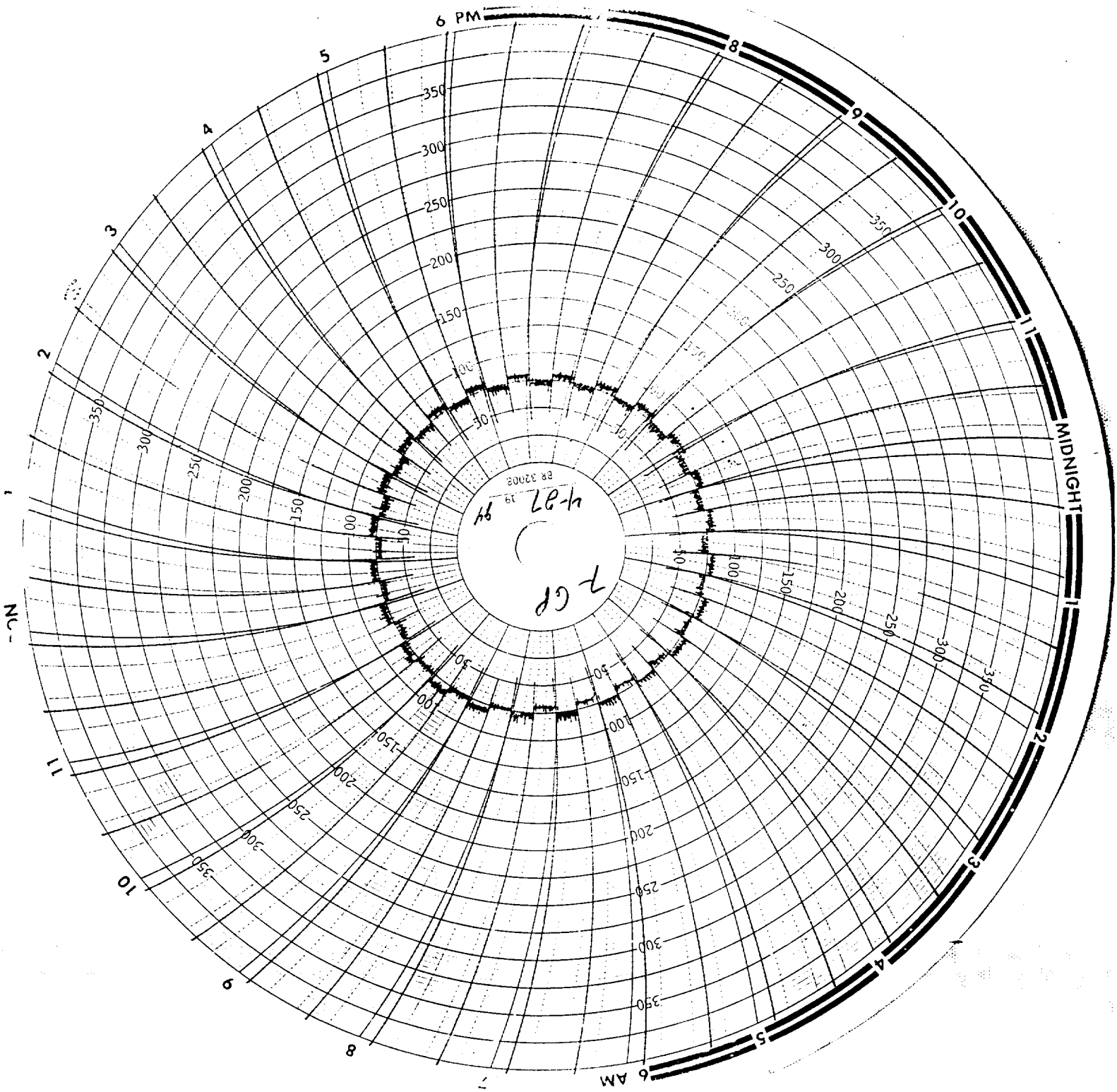
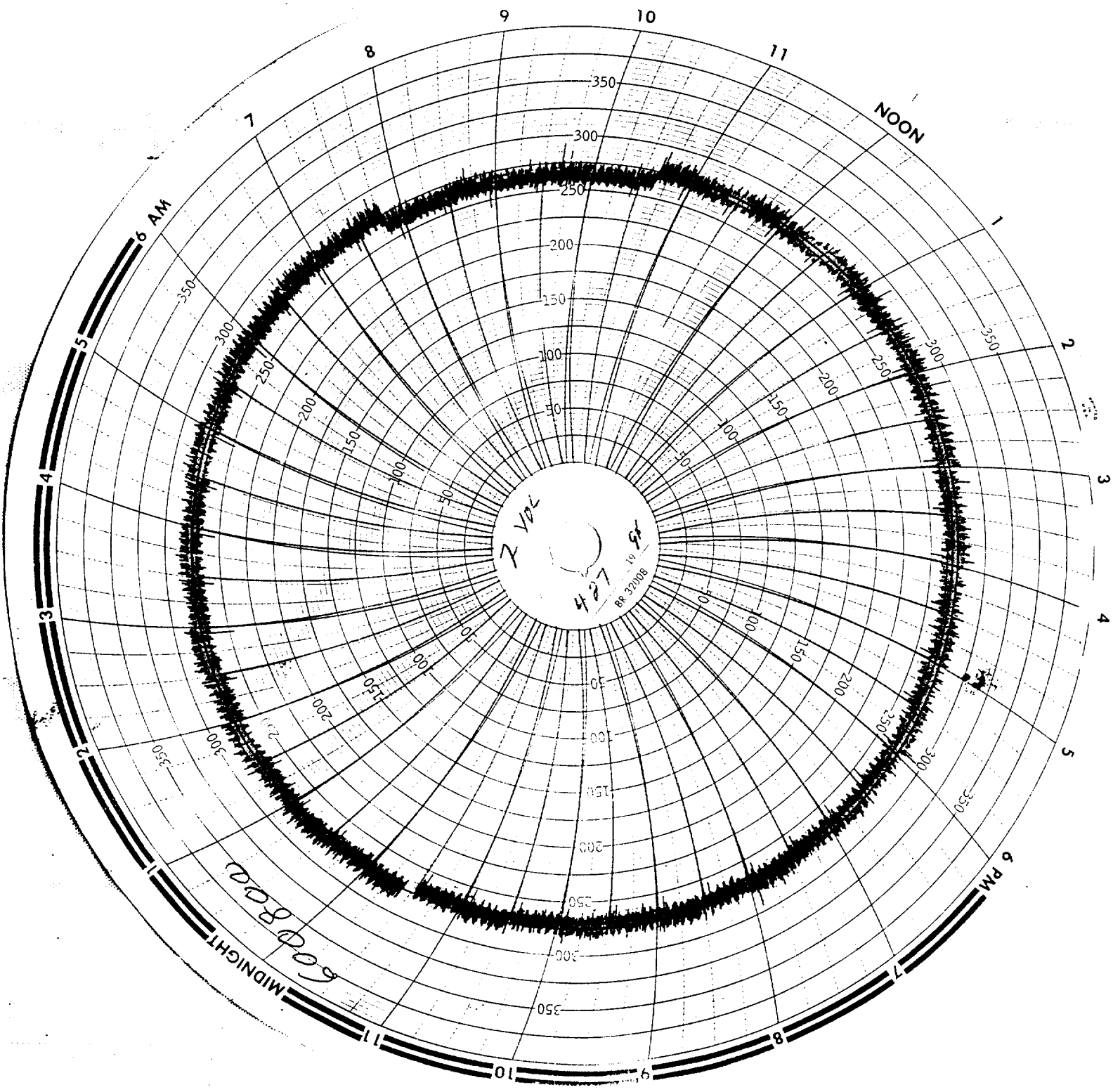
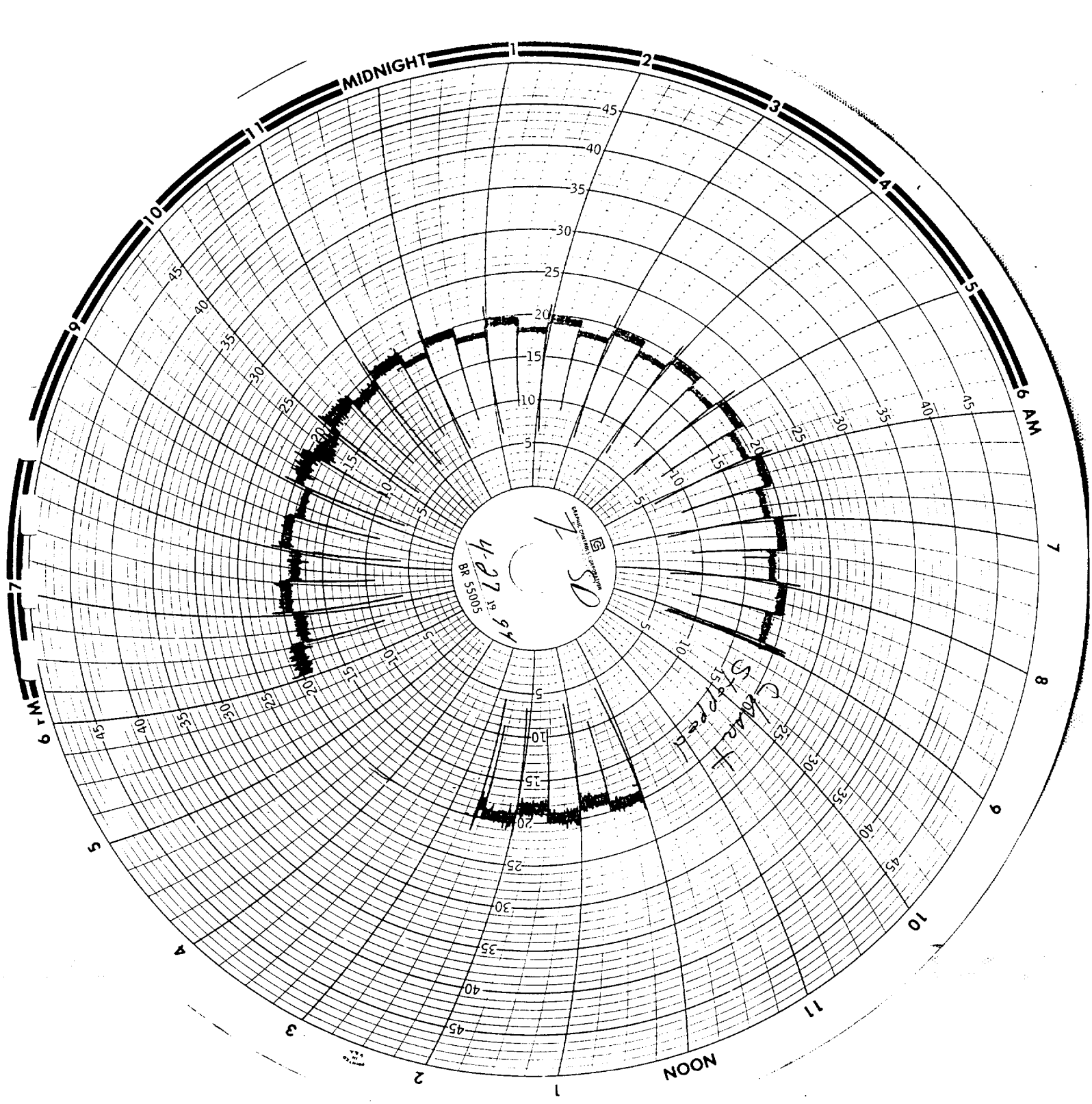
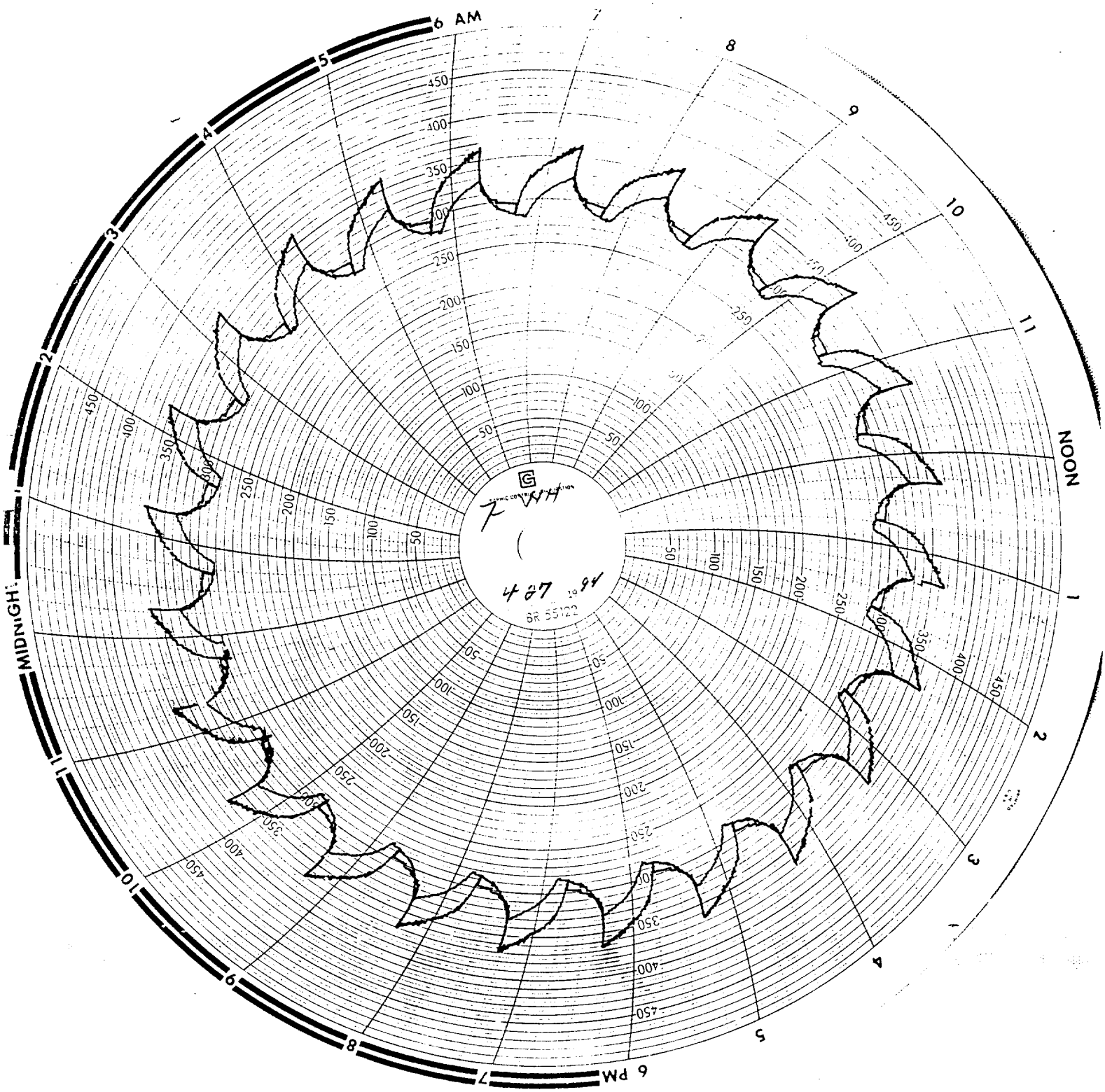
5
6 A.M.
7
8
9
10
11


6 PM
MIDNIGHT
6 AM
7-GP
4-27 94
BR 32008


NOON
6 AM
MIDNIGHT
6 PM
9
10
11
8
7
1
2
3
4
5
6
350
300
250
200
150
100
50
BP 32008


MIDNIGHT
6 AM
NOON
6 PM
GRAPHIC CONTROLS CORPORATION
BR 55005
4-27 19 94
Clear
Stopped


6 AM
NOON
MIDNIGHT
6 PM
7 WH
4 27 1994
BR 55122

COMPLIANCE DEMONSTRATION
NO. 7 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 STEEL
PLANT LOCATION: BATTERY STACK #7
PROJECT NUMBER: 393445-01
UNIT TESTED: B57

TEST DATE: 4/26 + 4/27/94
DATE RECEIVED: 4/26 + 4/27/94
DATE ANALYZED: 5/2/94
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-B57-1	1216	PARTICULATE		0.0295		0.1796			
CLR-B57-2	1217	PARTICULATE		0.0355		0.0793			
CLR-B57-3	1221	PARTICULATE		0.0255		0.0920			

Analyst's Signature: Patricia J. Stockton
Date: 5/9/94

Comments

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS — TEST DATE: 04-26-94

TEST SITE #7 BATTERY COMBUSTION STACK — TEST NUMBER: CLR-BS#7-1

A.	Barometric Pressure	29.10	in. Hg	
B.	Static Pressure	-1.0	in. H2O	
C.	Stack Pressure	29.03	in. Hg	[A+(B/13.6)]
D.	Average ∆ H	1.63	in. H2O	
E.	Meter Pressure	29.22	in. Hg	[A+(D/13.6)]
F.	Average ∆ P	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	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	535	°F	
N.	Average Stack Temperature	995	°R	(460+M)
O.	Average Meter Temperature	103	°F	
P.	Average Meter Temperature	563	°R	(460+O)
Q.	Condensate Volume	257.0	mL	
R.	Absorbed H2O	26.9	mL	
S.	Total H2O	283.9	mL	(Q+R)
T.	Filter Weight	0.0295	g	
U.	Probe Weight	0.1796	g	
V.	Impinger Weight		g	
W.	Total Weight	0.2091	g	(T+U+V)
X.	Metered Gas Volume	84.225	dcf	
Y.	Corrected Metered Gas Volume	85.303	dcf	(X*H)
Z.	H2O Gas Volume	14.665	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	99.968	cf	(Y+Z)
BB.	Percent H2O	14.7	%	(100*Z/AA)
CC.	Gas Volume Sampled	78.128	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0413	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.147		18	2.641
CO2	0.040	0.853	44	1.502
CO	0.000	0.853	28	0.000
O2	0.120	0.853	32	3.277
N2	0.840	0.853	28	20.070

Average Molecular Weight: 27.49 lb./lb. mol

FF.	Average Stack Velocity	17.9	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	76300	acfm	(60*FF*J)
HH.	Standard Flow Rate	39300	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	105.1	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	11.87	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS — TEST DATE: 04-26-94

TEST SITE #7 BATTERY COMBUSTION STACK — TEST NUMBER: CLR-BS#7-2

A.	Barometric Pressure	29.10	in. Hg	
B.	Static Pressure	-1.0	in. H2O	
C.	Stack Pressure	29.03	in. Hg	[A+(B/13.6)]
D.	Average ∆ H	1.72	in. H2O	
E.	Meter Pressure	29.23	in. Hg	[A+(D/13.6)]
F.	Average ∆ P	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	112	°F	
P.	Average Meter Temperature	572	°R	(460+O)
Q.	Condensate Volume	288.6	mL	
R.	Absorbed H2O	26.0	mL	
S.	Total H2O	314.6	mL	(Q+R)
T.	Filter Weight	0.0355	g	
U.	Probe Weight	0.0793	g	
V.	Impinger Weight		g	
W.	Total Weight	0.1148	g	(T+U+V)
X.	Metered Gas Volume	91.218	dcf	
Y.	Corrected Metered Gas Volume	92.386	dcf	(X*H)
Z.	H2O Gas Volume	16.511	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	108.897	cf	(Y+Z)
BB.	Percent H2O	15.2	%	(100*Z/AA)
CC.	Gas Volume Sampled	83.302	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0213	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.152		18	2.729
CO2	0.040	0.848	44	1.493
CO	0.000	0.848	28	0.000
O2	0.120	0.848	32	3.258
N2	0.840	0.848	28	19.954

Average Molecular Weight: 27.43 lb./lb. mol

FF.	Average Stack Velocity	19.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	83700	acfm	(60*FF*J)
HH.	Standard Flow Rate	43000	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	103.0	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	6.65	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS — TEST DATE: 04-27-94

TEST SITE #7 BATTERY COMBUSTION STACK — TEST NUMBER: CLR-BS#7-3

A.	Barometric Pressure	29.10	in. Hg	
B.	Static Pressure	-1.0	in. H2O	
C.	Stack Pressure	29.03	in. Hg	[A+(B/13.6)]
D.	Average ∆ H	1.77	in. H2O	
E.	Meter Pressure	29.23	in. Hg	[A+(D/13.6)]
F.	Average ∆ P	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	538	°F	
N.	Average Stack Temperature	998	°R	(460+M)
O.	Average Meter Temperature	96	°F	
P.	Average Meter Temperature	556	°R	(460+O)
Q.	Condensate Volume	308.1	mL	
R.	Absorbed H2O	22.3	mL	
S.	Total H2O	330.4	mL	(Q+R)
T.	Filter Weight	0.0255	g	
U.	Probe Weight	0.0920	g	
V.	Impinger Weight		g	
W.	Total Weight	0.1175	g	(T+U+V)
X.	Metered Gas Volume	87.895	dcf	
Y.	Corrected Metered Gas Volume	89.020	dcf	(X*H)
Z.	H2O Gas Volume	16.855	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	105.875	cf	(Y+Z)
BB.	Percent H2O	15.9	%	(100*Z/AA)
CC.	Gas Volume Sampled	82.588	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0220	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.159		18	2.866
CO2	0.040	0.841	44	1.480
CO	0.000	0.841	28	0.000
O2	0.120	0.841	32	3.229
N2	0.840	0.841	28	19.776

Average Molecular Weight: 27.35 lb./lb. mol

FF.	Average Stack Velocity	19.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	83900	acfm	(60*FF*J)
HH.	Standard Flow Rate	43100	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	102.8	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	6.82	lb/hr	[DD*HH*(1-BB/100)*60/7000]