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.

1992

COMPLIANCE DEMONSTRATION
#9 BATTERY COMBUSTION STACK

Prepared for:

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PA

Prepared by:

KEYSTONE ENVIRONMENTAL RESOURCES
3000 TECH CENTER DRIVE
MONROEVILLE, PA 15146

PROJECT NUMBER: 605048-01

NOVEMBER 1992

ALLEGHENY COUNTY HEALTH DEPARTMENT

CORRESPONDENCE TRANSMITTAL MEMO

FROM C.J. GOETZ DATE 11-24-92

TO	DATE REC'D.	INITIAL
H.L. PATEL / Phil Lawrence	11/30	PL
R.C. WESTMAN	11/30	RCW
G.L.	11/24	G.L.
~~A.H. FIESEL~~ → WGG/WJC	12/2/92	AHF

- ☐ Note & Forward
- ☒ ~~Note & Return~~
- ☒ Note & File
- ☐ For Your Approval
- ☒ For Your Information
- ☐ Prepare Reply – My Signature
- ☐ See Me About This
- ☐ Take Charge of This
- ☐ Comment & Return
- ☐ For Your Signature
- ☐ Per Your Request
- ☐ Reply Direct – Send Me Copy

REMARKS Return in Engineering file.

CJG

16CS0680

USS
Clairton Works
400 State Street
Clairton, PA 15025

RECEIVED
NOV 1 3 1992
DEPUTY DIRECTOR
Bureau of Air Pollution Control

November 10, 1992

Director
Bureau of Air Quality Control
Department of Environmental Resources
P.O. Box 2063
Harrisburg, PA 17120

Deputy Director
Allegheny County Health Department
Bureau of Air Pollution Control
301 Thirty-ninth Street
Pittsburgh, PA 15201

U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19017

Office of Chief Counsel
Western Region
Department of Environmental Resources
400 Waterfront Drive
Pittsburgh, PA 15222-4745

Gentlemen:

Subject: Compliance Demonstration
Clairton Battery Stack #9

Please find enclosed with this letter the mass emission report on #9 Battery combustion stack. The compliance demonstration was conducted at USS Clairton Works, a division of USX Corporation, on October 8-9, 1992.

For further details on this report, please contact William C. Graeser at (412) 233-1467.

Very truly yours,

G. T. Weber, Jr.
General Manager
USS Clairton Works

GTW/BAC
Attachment

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APPENDIX F ANALYTICAL RESULTS
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ABSTRACT

On October 8 and 9, 1992, 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 rates 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 allowable particulate matter concentration for #9 Battery Combustion Stack, as required by the Amended Mon Valley Consent Decree, is 0.030 gr/dscf. The results of three test runs produced an average particulate matter concentration and emission rate of 0.0052 gr/dscf and 1.79 lb/hr, respectively. Thus, the particulate matter emissions from the stack are in compliance. The Amended Mon Valley Consent Decree requires that 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. Plume opacity is determined and recorded at 15 second intervals for the duration of each stack test. For the first and third test runs, the greatest opacity was 5 percent. During the second test run, there were three consecutive readings of 20 percent opacity immediately followed by one reading of 25 percent (the highest opacity recorded). Thus, the visible emissions are in compliance.

1.0 INTRODUCTION

On October 8 and 9, 1992, 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 the Air Quality Engineering Division of Keystone Environmental Resources (Keystone). The test crew was comprised of David Beranek, Richard Casselberry, and Mark Valerio. Visible emissions determinations were performed by James McKoy of Environmental Technical Services (ETS). Keystone and ETS are divisions of the Chester Environmental Group. All test procedures were witnessed by Phil Lawrence of the Allegheny County Health Department Bureau of Air Pollution Control (BAPC).

The test program took place over two days, not the anticipated one day, due to a delay in the operation of the Battery #9. On the morning of October 8, 1992, after the completion of the first test run, Keystone was notified that no pushing or charging would take place on the battery for approximately two hours. Thus, no sampling occurred during this time period. Once normal operation of the battery was resumed (about 3:00 PM), the second run of the particulate matter sampling began. The third test run was conducted on the following day, October 9, 1992.

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 and Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual. 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. A schematic diagram of the combustion stack and traverse points can be found in Figure 2-1.

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 a Bacharach "Fyrite" apparatus as specified by EPA Method 3. Gas concentrations were used to obtain molecular weight of the process gas on a dry basis.

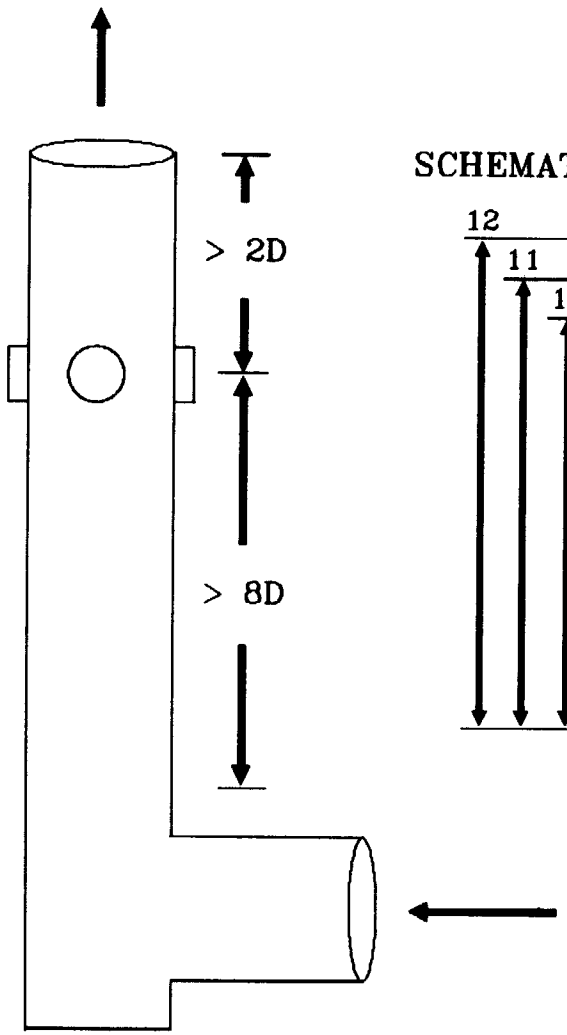
Percent moisture content, by volume, of the exhaust gas was determined by measuring the weight gain of the four sample train impingers in accordance with EPA Method 4.

As specified by EPA Method 5, each sampling 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. The acetone rinses were

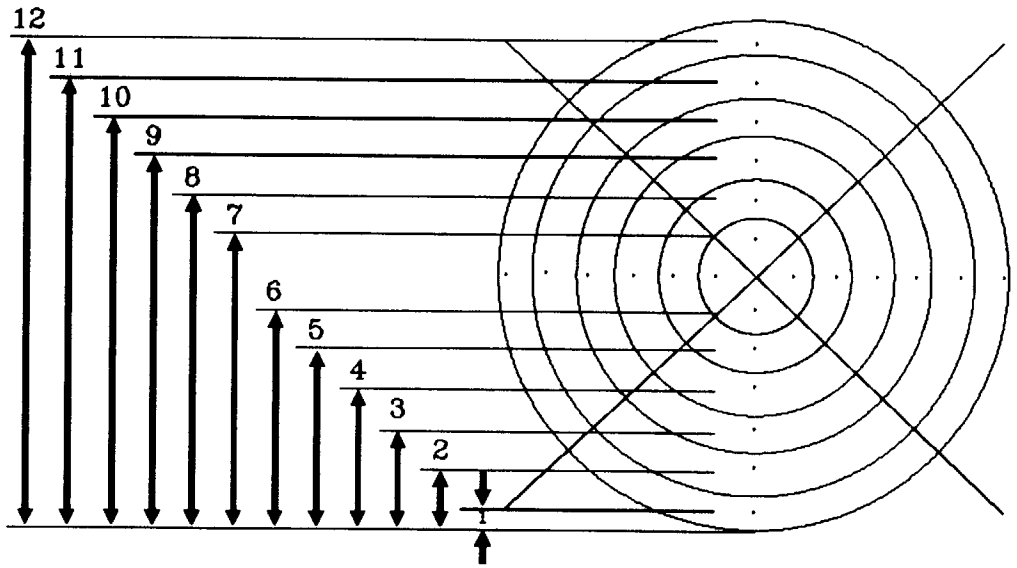
FIGURE 2-1

USS CLAIRTON WORKS
CLAIRTON, PA

#9 BATTERY COMBUSTION STACK
SCHEMATIC OF THE STACK AND TRAVERSE POINTS



Stack Diameter (D) = 114 inches



Traverse Point	Distance (in.)	Traverse Point	Distance (in.)
1	2.4	7	73.5
2	7.6	8	85.5
3	13.5	9	93.8
4	20.2	10	100.5
5	28.5	11	106.4
6	40.6	12	111.6

KEYSTONE ENVIRONMENTAL RESOURCES, INC.

evaporated to dryness, desiccated, and weighed to a constant weight. The sample train filters were dried, desiccated for 24 hours, and weighed to a constant weight. Rinse residue weights and filter weights were measured to the nearest 0.1 milligram. One acetone blank was prepared in the same manner as the test sample acetone rinses. The blank residue weight was subtracted from the test sample rinse residue weights. Front-half acetone rinse residue weights (after blank correction) 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.

3.0 RESULTS

All testing was performed during periods of normal plant operation. To validate this, copies of the operational data can be found in Appendix B.

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 BAPC can be found in Appendix C.

Copies of the field data sheets for the particulate matter sampling can be found in Appendix D. The emissions calculations for each test can be found in Appendix E. Analytical results for the three test runs can be located in Appendix F.

The test results for particulate matter have been summarized in Table 3-1. 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. The results of the testing yielded an average particulate matter concentration and emission rate of 0.0052 grains per dry standard cubic feet (gr/dscf) and 1.79 pounds per hour (lb/hr), respectively. The actual particulate matter concentration is less than the allowable concentration, thus, the particulate matter emissions from the stack are in compliance.

Table 3-1 also lists other pertinent stack and sampling parameters which include stack gas flow rate expressed in units of actual cubic feet per minute (acfm), standard cubic feet per minute (scfm), and dry standard cubic feet per minute (dscfm), moisture content of the stack gas (percent by volume), stack gas temperature (^{o}F), gas volume sampled for each test in units of dry standard cubic feet (dscf), and the isokinetics value for each test. 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 102.6 percent, 98.6 percent, and 103.7 percent; therefore, all values were within the acceptable range. PA DER Source Testing Manual, Section 139.12 (4) requires that a minimum of 50 dscf be sampled for each test run. The sample volumes for test runs one

TABLE 3-1

USS CLAIRTON WORKS
CLAIRTON, PA

#9 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

		Run 1	Run 2	Run 3	Average
Test Number		CLR-BS9-1	CLR-BS9-2	CLR-BS9-3	
Test Date		10/8/92	10/8/92	10/9/92	
Mass Emission Rate and Concentration					
Particulate Matter	(lb/hr)	1.31	2.21	1.86	1.79
	(gr/dscf)	0.0037	0.0064	0.0055	0.0052
Stack Conditions					
Flow Rate	(acfm)	84900	83380	84890	84390
	(scfm)	45670	45510	44770	45320
	(dscfm)	41750	40400	39600	40580
Temperature	(°F)	500.5	483.3	514.7	499.5
Moisture Content	(%)	8.6	11.2	11.6	10.5
Sampling Conditions					
Test times		8:53 to 9:23	15:04 to 15:34	12:08 to 12:38	
		9:33 to 10:03	15:46 to 16:16	12:44 to 13:14	
		10:10 to 10:40	16:25 to 16:55	13:20 to 13:50	
		10:48 to 11:18	17:02 to 17:32	13:58 to 14:28	
Sampling Time	(minutes)	120	120	120	
Sample Volume	(dscf)	74.838	69.612	71.731	
Isokinetics	(%)	102.6	98.6	103.7	

through three are 74.838 dscf, 69.612 dscf, and 71.731 dscf, respectively, therefore, this requirement has been met. Actual test sampling times have also been included in Table 3-1.

Visible emissions data is summarized in Table 3-2. Visible emissions were recorded continuously for all three test runs. 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." Plume opacity is determined and recorded at 15 second intervals for the duration of each stack test. The highest visible emissions readings were recorded during the second test run. There were three consecutive readings of 20 percent opacity followed immediately by one reading of 25 percent opacity. The opacities for the first and third test runs did not exceed 5 percent. Thus, the visible emissions are in compliance. Copies of the field data sheets for the visible emissions readings can be found in Appendix G.

TABLE 3–2

USS CLAIRTON WORKS
CLAIRTON, PA

#9 BATTERY COMBUSTION STACK
VISIBLE EMISSIONS DATA

Run Number	1	2	3
Observation Date	10–8–92	10–8–92	10–9–92
Observation Time	8:45 to 11:45	15:05 to 17:35	12:00 to 14:30
Total Number of Readings	720	600	600
Number of Readings with Opacity ≤ 20%	720	599	600
Greatest Opacity	5%	25%	5%

COMPLIANCE DEMONSTRATION
#9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PA

APPENDIX A

TEST PROTOCOL

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

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 in the same horizontal plane. With six traverse points sampled per port and each point sampled for 5 minutes, the total sampling time will be 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 a Bacharach "Fyrite" apparatus as specified by EPA Method 3. Gas concentrations will be used to obtain molecular weight of the process gas.

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 mg. 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 Pollution Control, field data sheets for the particulate matter sampling and visible emissions determinations, computer-generated emissions calculations, and analytical results for each test.

COMPLIANCE DEMONSTRATION
#9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PA

APPENDIX B

OPERATIONAL DATA

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

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 10-08-92

BATTERY NO. A-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	2	52	3	13	
4	3	03	3	22	
6	3	14	3	30	
8	3	25	3	39	
10	3	36	3	50	
12	3	48	4	04	
14	4	02	4	16	
16	4	08	4	28	
18	4	26	4	40	
20	4	38	4	52	
22	4	50	5	00	
24	5	02	5	16	
26	5	14	5	28	
28	5	26	5	40	
30	5	38	6	04	
1					
2					

BATTERY NO. B-9					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	6	02	6	12	
3	6	10	6	22	
5	6	20	6	28	
7	6	30	6	44	
9	6	42	6	56	
11	6	54	7	08	
13	7	06	7	20	
15	7	18	7	28	
17	7	30	7	40	
19	7	42	7	56	
21	7	54	8	04	
23	8	06	8	12	
25	8	18	8	23	
27	8	30	8	35	
29	8	42	8	47	
31	8	53	8	58	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
C2	9	06	9	14	

BATTERY NO. A-8					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3			12	15	
5	12	11	12	25	
7	12	22	12	35	
9	12	33	12	58	
11	12	45	1	08	
13	1	05	1	17	
15	1	19	1	28	
17	1	30	1	38	
19	1	40	1	48	
21	1	50	1	59	
23	2	01	2	10	
25	2	12	2	20	
27	2	22	2	29	
29	2	32	2	42	
31	2	40	2	59	
2	9	12	9	26	
4	9	24	9	34	
6	9	36	9	46	
8	9	48	9	58	
10	10	00	10	14	
12	10	12	10	22	
14	10	24	10	34	
16	10	36	10	46	
18	10	48	11	10	
20	11	00	11	22	
22	11	12	11	34	
24	11	24	11	46	
26	11	36	-	-	
28	11	48	-	-	
30					
1					
2					

REMARKS:

15/15 17/17 28/27

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

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

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

Total Ovens Pushed 60/59

Total Ovens Charged

Pusherman

Battery Foreman D. Fowler

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 M
Date 10-8-92

BATTERY NO. A5 9					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	4	43	4	55	
3	4	57	5	05	
5	5	09	5	25	
7	5	27	5	31	
9	5	33	5	55	
11	5	57	6	--	
13	6	09	6	19	
15	6	21	6	30	
17	6	32	6	41	
19	6	43	6	52	
21	6	54	7	02	
23	7	04	7	12	
25	7	14	7	22	
27	7	24	7	32	
28	7	34	7	42	
31	7	44	7	56	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					

BATTERY NO. B5 9					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17			12	09	
19	12	11	12	35	
21	12	39	12	48	
23	12	50	12	54	
25	12	56	1	04	
27	1	06	1	14	
29	1	16	1	24	
31	1	26	1	36	
2	7	58	8	20	
4	8	45	8	55	
6	8	57	9	07	
8	9	08	9	24	
10	9	19	9	35	
12	9	31	9	44	
14	9	43	9	53	
16	9	55	10	08	
18	10	06	10	16	
20	10	17	10	30	
22	10	28	10	40	
24	10	38	10	50	
26	10	48	11	00	
28	10	59	11	13	
30	11	12	11	27	
C-1	11	17	11	40	
C 2	1	37	1	42	

BATTERY NO. A5 8					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	11	30	11	59	V
3	11	49			
5					
7					
9					
11					
13					
15					
17					
19					
21					
23					
25					
27					
29					
31					
2	1	44	2	--	
4	2	02	2	06	
6	2	08	2	11	
8	2	13	2	17	
10	2	19	2	33	
12	2	54	3	03	
14	3	05	3	14	
16	3	16	3	24	
18	3	26	3	35	
20	3	37	3	46	
22	3	48	3	58	
24	4	--	4	09	
26	4	17	4	20	
28	4	22	4	30	
30	4	32	4	41	
1					
2					

REMARKS: A-1/8 NEW-DOOR

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

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

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	5	5	
7-8	6	6	
8-9	2	2	
9-10	5	5	
10-11	6	5	
11-12	4	5	
	28	28	

Total Ovens Pushed 59
Total Ovens Charged 59

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 10-9-92

BATTERY NO. A5 9					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	7	24	7	46	
3	7	36	7	58	
5	7	48	8	10	
7	8	00	8	22	
9	8	12	8	34	
11	8	24	8	46	
13	8	36	8	58	
15	8	48	9	10	
17	9	00	9	22	
19	9	12	9	34	
21	9	24	9	46	
23	9	36	9	58	
25	9	48	10	10	
27	10	00	10	22	
29	10	12	10	40	
31	10	24	10	52	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20			12	04	
22			12	16	
24	12	06	12	28	
26	12	18	12	41	
28	12	30	1	00	
30	12	43	1	11	
1					
2					

BATTERY NO. B5 9					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	1	02	1	24	
3	1	13	1	36	
5	1	26	1	48	
7	1	38	2	01	
9	1	50	2	13	
11	2	03	2	25	
13	2	15	2	37	
15	2	27	2	50	
17	2	39	3	02	
19	2	52	3	14	
21	3	04	3	27	
23	3	16	3	39	
25	3	29	3	51	
27	3	41	4	04	
29	3	53	4	16	
31	4	06	4	19	
2	10	42	11	04	
4	10	54	11	16	
6	11	06	11	28	
8	11	18	11	40	
10	11	30	11	52	
12	11	42	—		
14	11	52	—		
16					
18					
20					
22					
24					
26					
28					
30					
1					
C2	4	18	4	34	

BATTERY NO. A5 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	24	4	46	
4	4	36	4	58	
6	4	48	5	10	
8	5	00	5	22	
10	5	12	5	34	
12	5	24	5	46	
14	5	36	5	58	
16	5	48	6	10	
18	6	00	6	22	
20	6	12	6	34	
22	6	24	6	46	
24	6	36	6	58	
26	6	48	7	10	
28	7	00	7	22	
30	7	12	7	34	
1					
2					

REMARKS:

20 / 22 24 / 22 15 / 15

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

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

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

Total Ovens Pushed 59
Total Ovens Charged 59

Pusherman

Battery Foreman

CC-10295 REV. 1181
03.081.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 3
12 Hrs. Beginning 12:00 A M
Date 10-9-92

BATTERY NO. A-9

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	12	18	12	38	
3	12	30	1	06	
5	12	40	1	31	
7	1	08	1	42	
9	1	33	1	52	
11	1	44	2	02	
13	1	54	2	12	
15	2	04	2	23	
17	2	14	2	34	
19	2	25	2	45	
21	2	36	2	58	
23	2	47	3	10	
25	3	--	3	21	
27	3	12	3	32	
29	3	23	3	45	
31	3	33	3	56	
2	9	50	10	13	
4	10	03	10	27	
6	10	15	10	38	
8	10	27	10	50	
10	10	40	11	02	
12	10	52	11	14	
14	11	04	11	27	
16	11	16	11	39	
18	11	29	11	51	
20	11	41			
22	11	53			
24					
26					
28					
30					
1					
2					

BATTERY NO. B-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	3	47	4	06	
4	3	58	4	16	
6	4	08	4	26	
8	4	18	4	36	
10	4	28	4	46	
12	4	38	4	58	
14	4	48	5	10	
16	5	--	5	22	
18	5	12	5	34	
20	5	24	5	46	
22	5	36	5	56	
24	5	48	6	10	
26	6	--	6	22	
28	6	12	6	28	
30	6	24	6	40	
C1	6	30	6	52	
2					

BATTERY NO. A-8

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	6	42	7	04	
3	6	54	7	16	
5	7	06	7	28	
7	7	18	7	40	
9	7	30	7	52	
11	7	42	8	04	
13	7	54	8	16	
15	8	06	8	28	
17	8	18	8	40	
19	8	30	8	53	
21	8	42	9	05	
23	8	55	9	18	
25	9	07	9	30	
27	9	20	9	42	
29	9	32	9	48	
31	9	44	10	01	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26			12	06	
28			12	16	
30	12	08	12	28	
1					
2					

REMARKS: 24/25 16/16 17/19

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

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

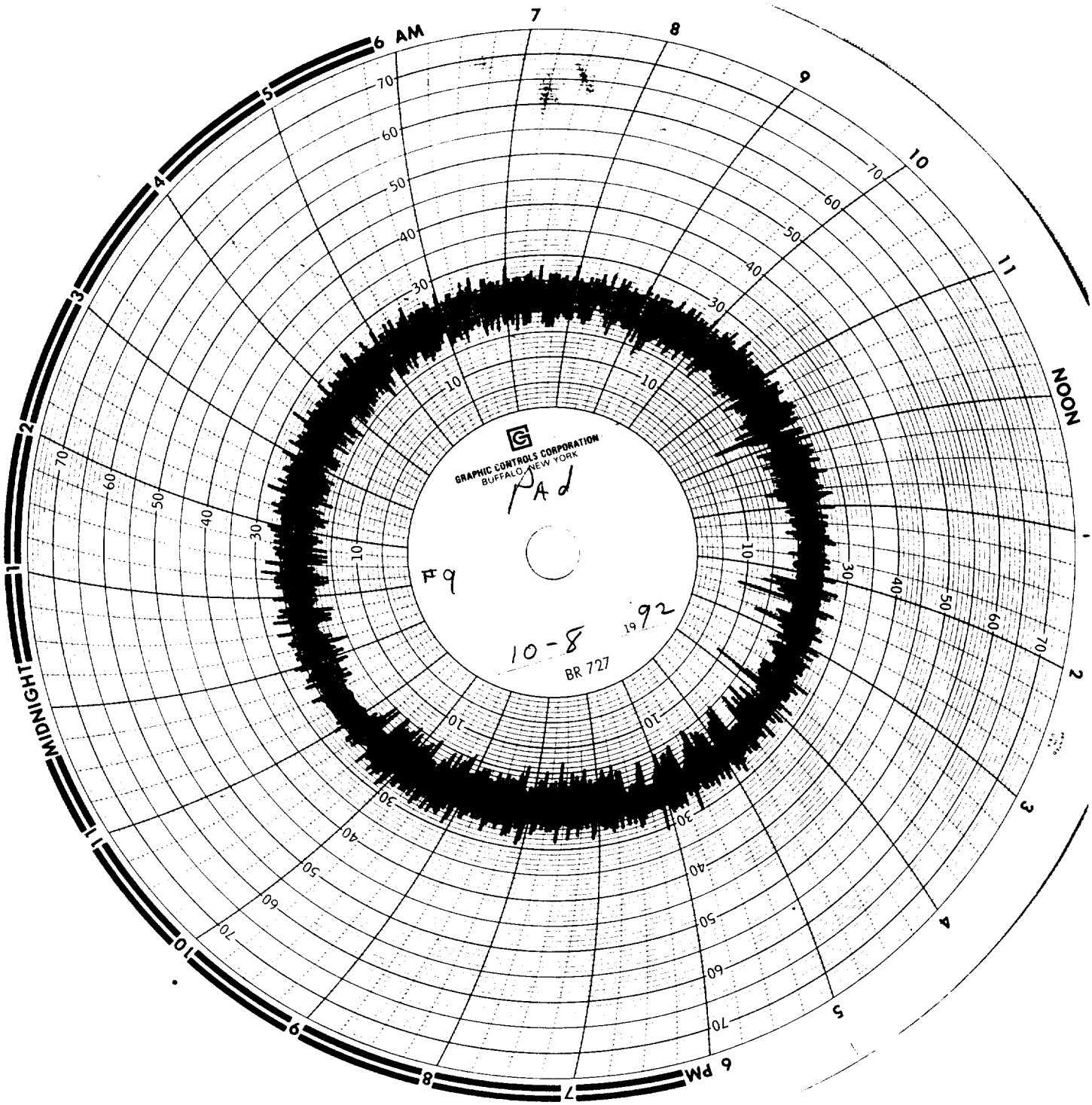
TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	6	5	
7-8	5	5	
8-9	5	5	
9-10	5	5	
10-11	5	5	
11-12	5	5	
	31	31	

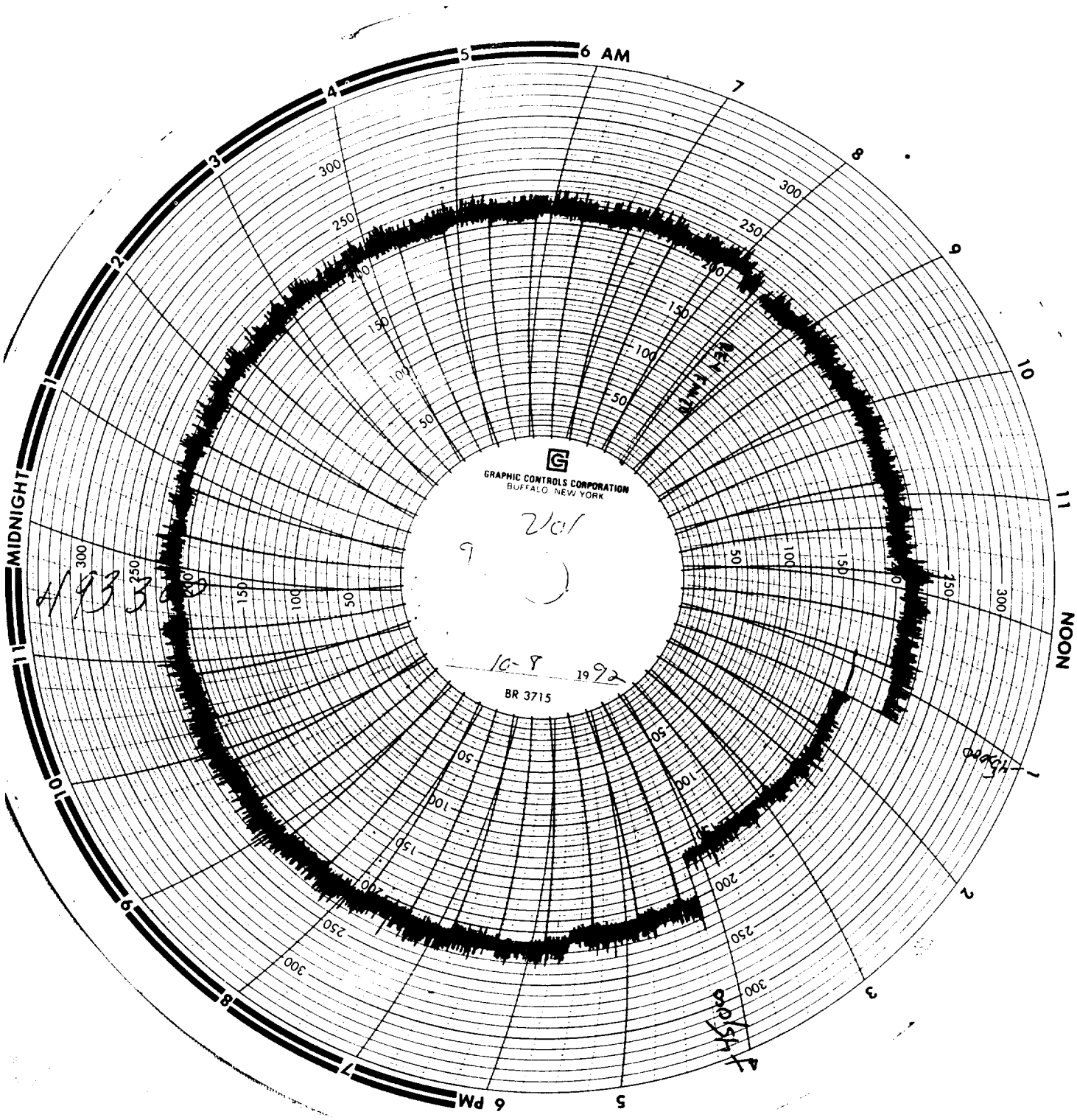
Total Ovens Pushed 60

Total Ovens Charged 60

Pusherman

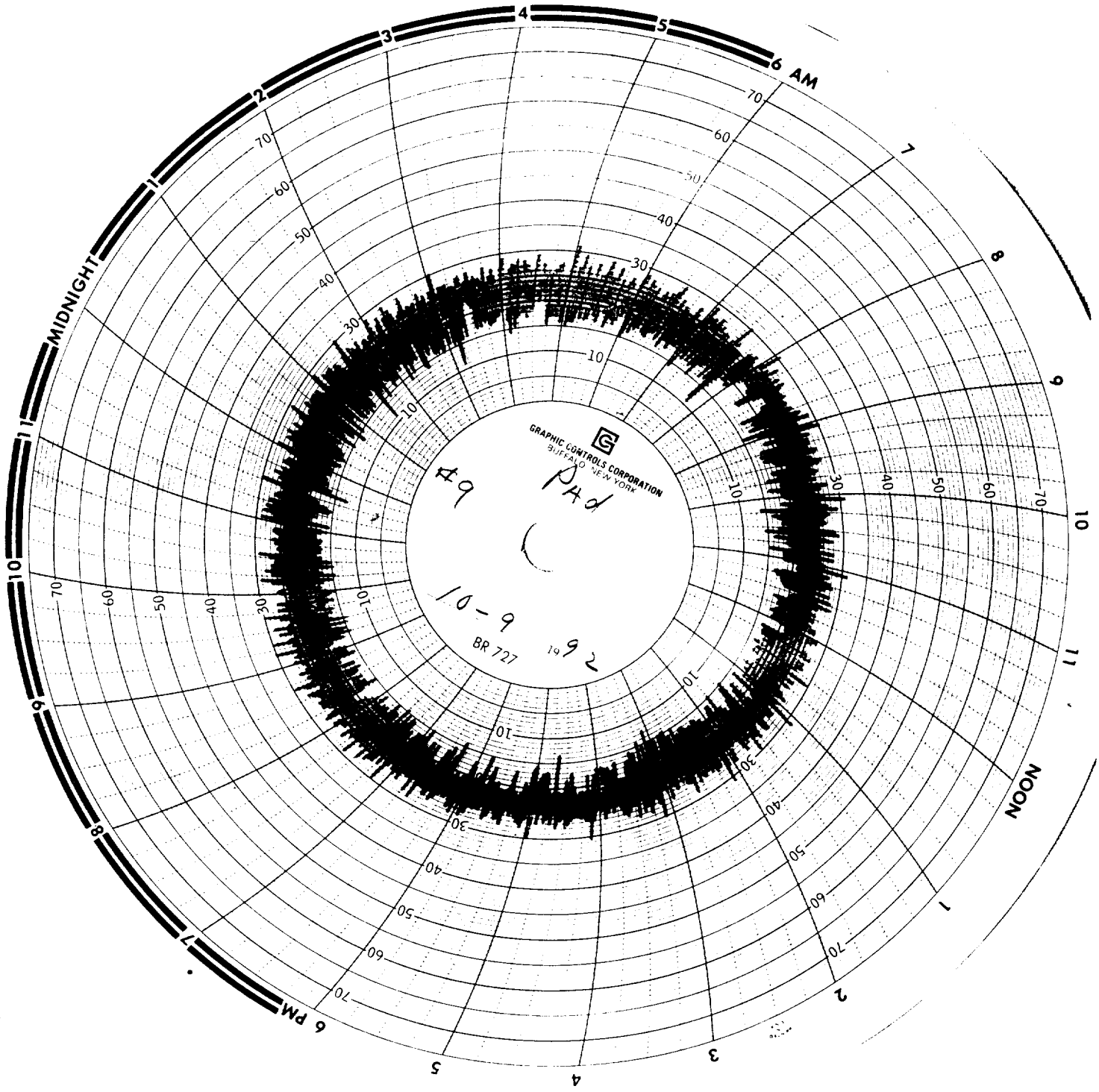
Battery Foreman

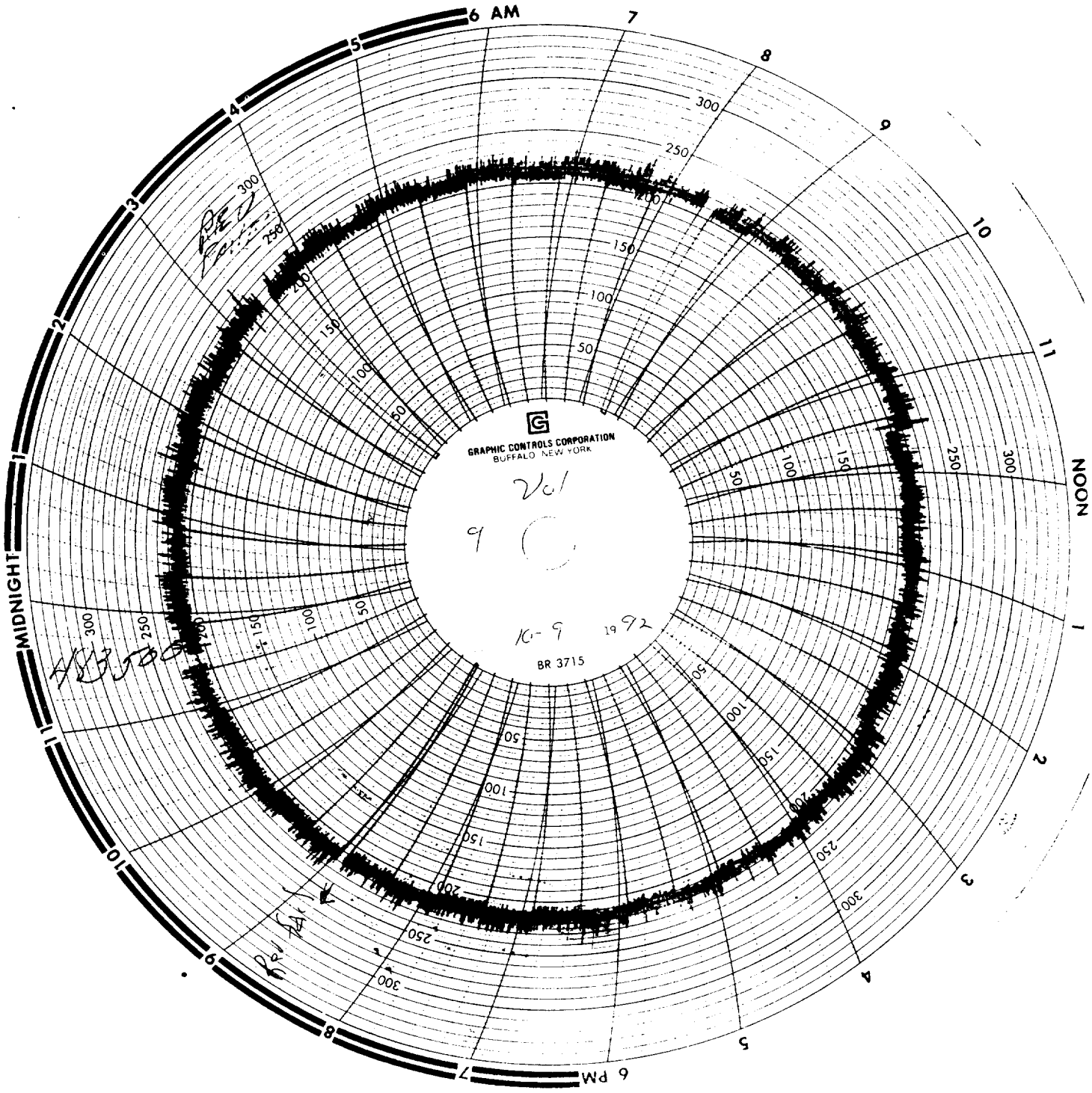

6 AM
NOON
6 PM
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
PAd
10-8
1992
BR 727

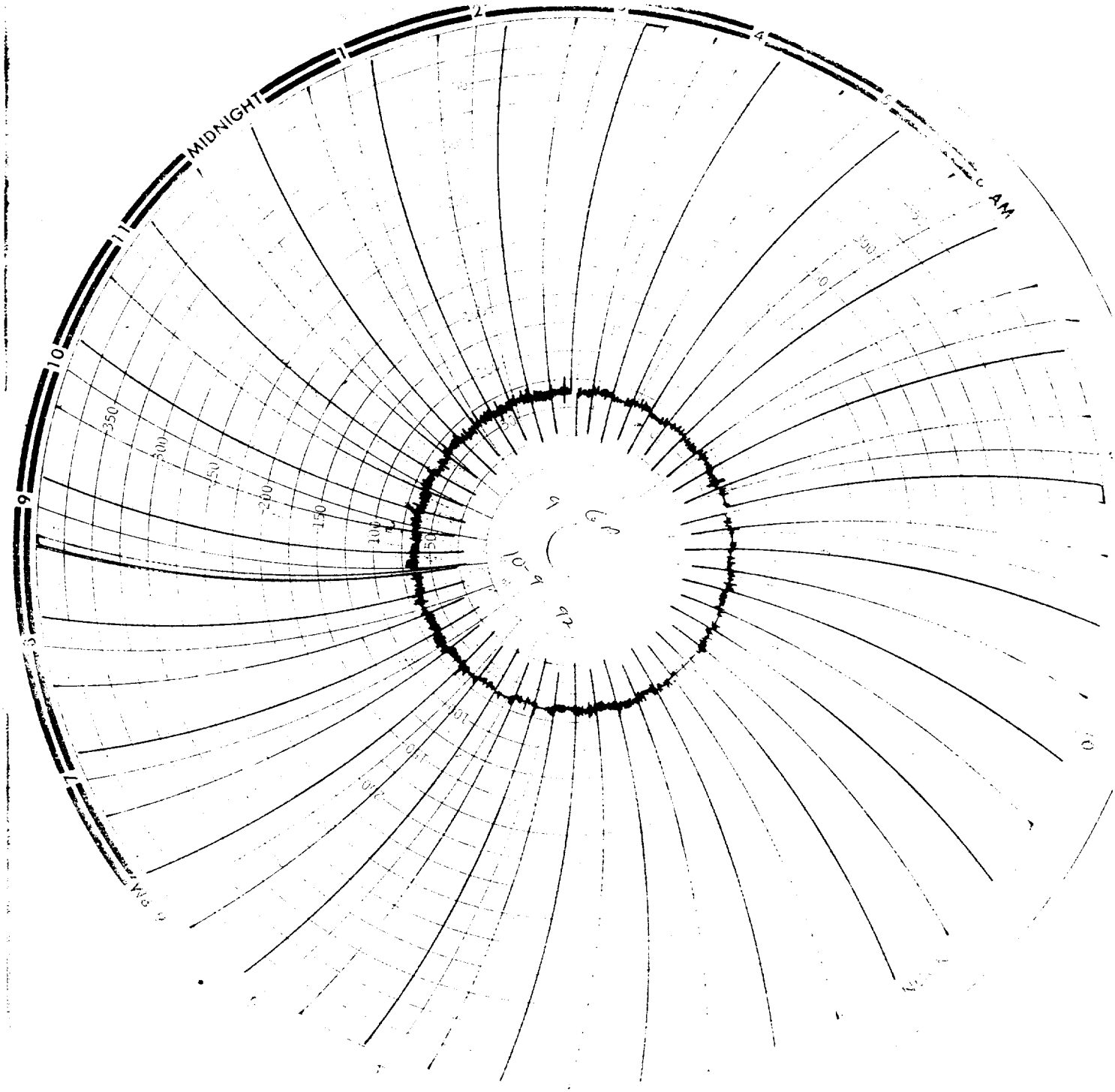

6 AM
NOON
MIDNIGHT
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
BR 3715
1992

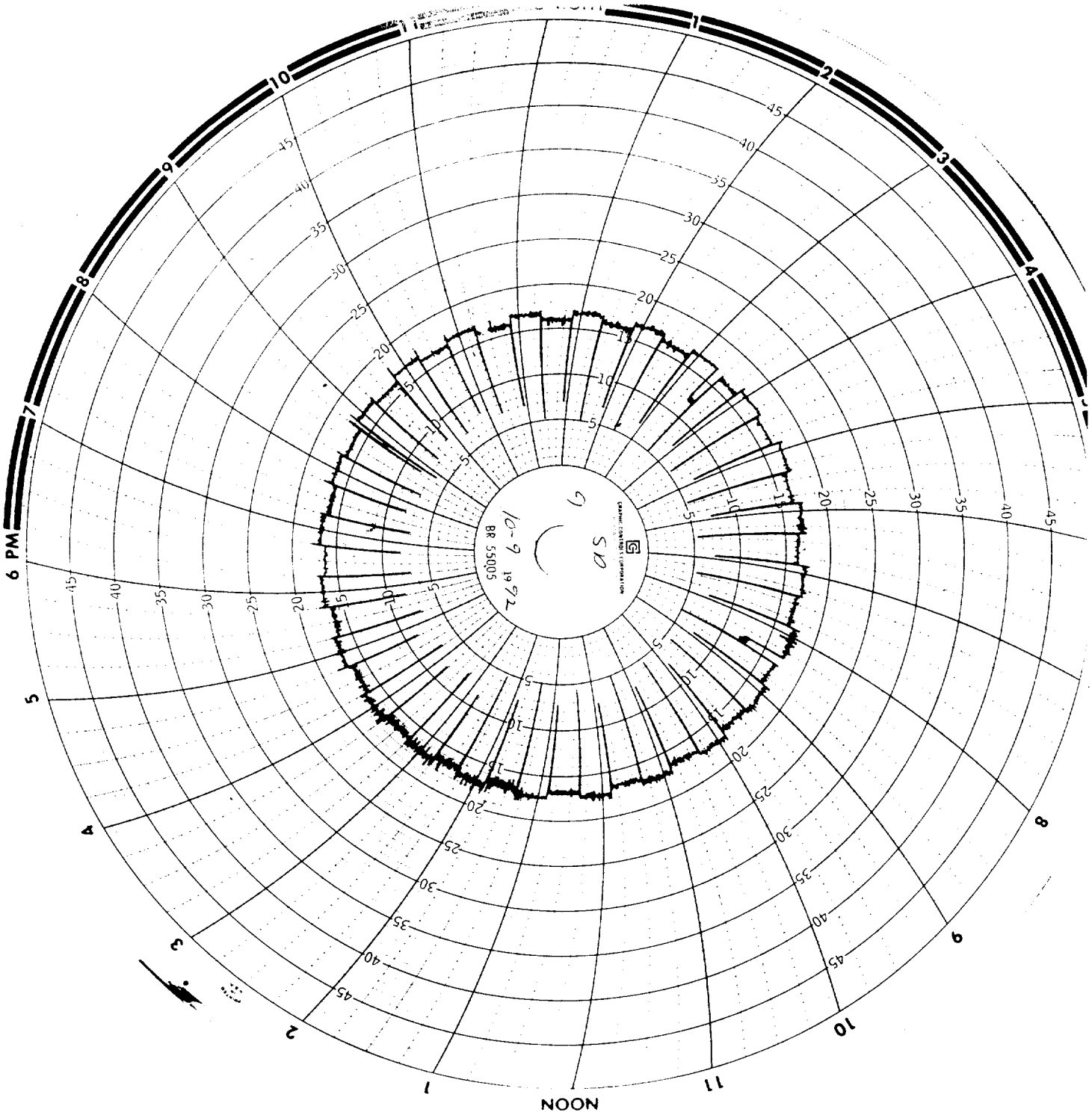
NOON
6 PM
MIDNIGHT
6 AM

MIDNIGHT
6 AM
NOON
6 PM
1
2
3
4
5
7
8
9
10
11
45
40
35
30
25
20
15
10
5
GRAPHIC CONTROLS CORPORATION
BR 55005


MIDNIGHT
AM
NOON
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
#9
Rad
10-9
BR 727
1992

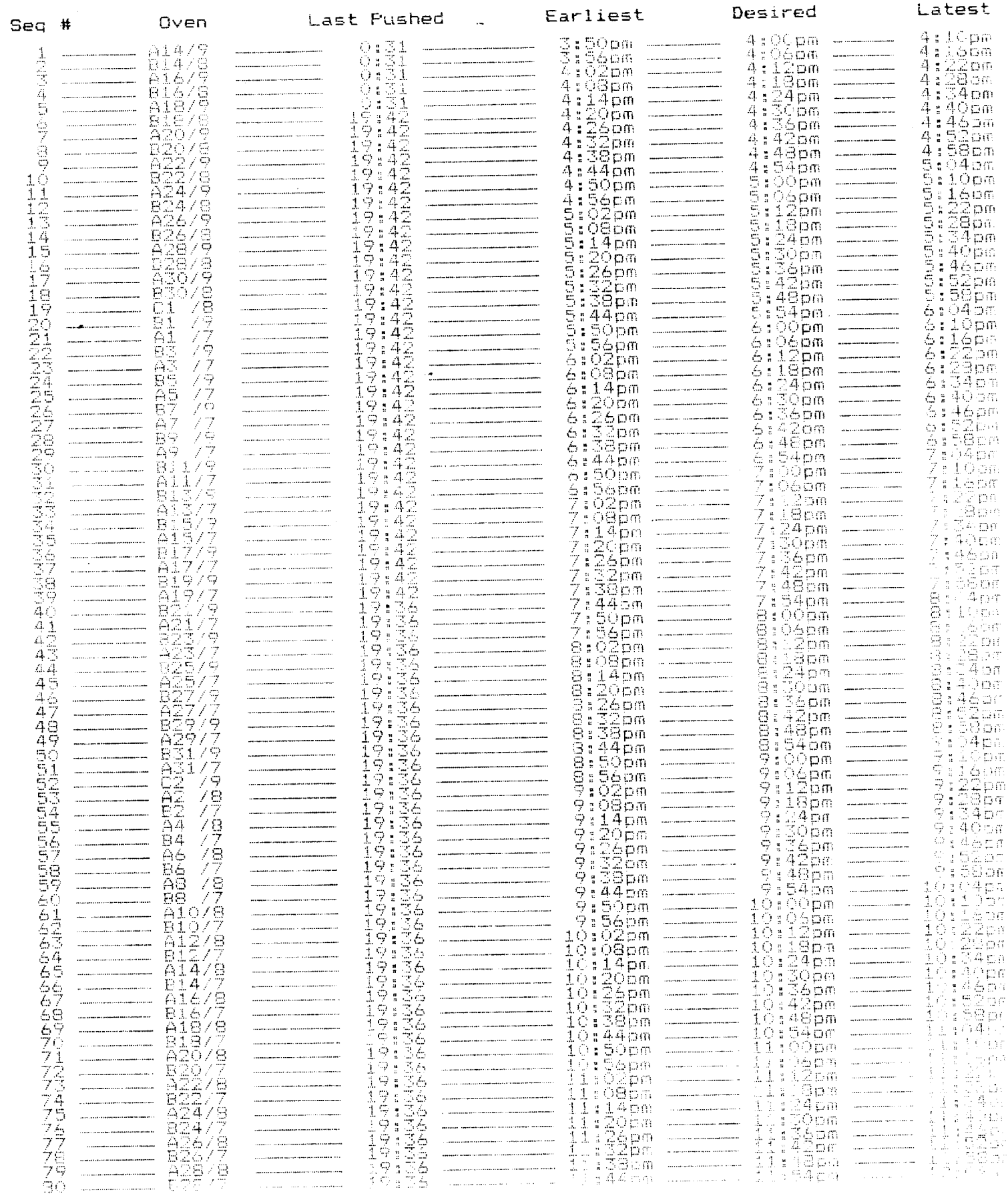

6 AM
NOON
6 PM
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
Vol
10-9 1992
BR 3715


MIDNIGHT
1
2
4
AM
9
10
11
350
300
250
200
150
100
50


NOON
1
2
3
4
5
6 PM
7
8
9
10
11
10-9 1972
BR 55005

PUSHING SCHEDULE

Thursday, October 8. 1992 Turn 3
Batteries: 7-9_2



PUSHING SCHEDULE

Thursday, October 8, 1992 Turn 2
Batteries: 7-9_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	A2 /7	19:05	7:50am	8:00am	8:10am
2	B4 /9	19:05	7:57am	8:06am	8:15am
3	A4 /7	19:05	8:03am	8:12am	8:21am
4	B6 /9	19:05	8:09am	8:18am	8:27am
5	A6 /7	19:05	8:14am	8:24am	8:33am
6	B8 /9	19:04	8:20am	8:30am	8:40am
7	A8 /7	19:04	8:26am	8:36am	8:46am
8	B10/9	19:05	8:33am	8:43am	8:53am
9	A10/7	19:05	8:39am	8:49am	8:59am
10	B12/9	19:05	8:45am	8:55am	9:05am
11	A12/7	19:05	8:51am	9:01am	9:11am
12	B14/9	19:04	8:57am	9:07am	9:17am
13	A14/7	19:04	9:03am	9:13am	9:23am
14	B16/9	19:05	9:10am	9:20am	9:30am
15	A16/7	19:05	9:16am	9:26am	9:36am
16	B18/9	19:05	9:22am	9:32am	9:42am
17	A18/7	19:05	9:28am	9:38am	9:48am
18	B20/9	19:05	9:34am	9:44am	9:54am
19	A20/7	19:04	9:40am	9:50am	10:00am
20	B22/9	19:04	9:46am	9:56am	10:06am
21	A22/7	19:05	9:53am	10:03am	10:13am
22	B24/9	19:05	9:59am	10:09am	10:19am
23	A24/7	19:05	10:05am	10:15am	10:25am
24	B26/9	19:05	10:11am	10:21am	10:31am
25	A26/7	19:04	10:17am	10:27am	10:37am
26	B28/9	19:04	10:23am	10:33am	10:43am
27	A28/7	19:05	10:30am	10:40am	10:50am
28	B30/9	19:05	10:36am	10:46am	10:56am
29	A30/7	19:05	10:42am	10:52am	11:02am
30	B32/9	19:05	10:48am	10:58am	11:08am
31	A32/7	19:04	10:54am	11:04am	11:14am
32	B34/9	19:04	11:00am	11:10am	11:20am
33	A34/7	19:04	11:06am	11:16am	11:26am
34	B36/9	19:05	11:13am	11:23am	11:33am
35	A36/7	19:05	11:19am	11:29am	11:39am
36	B38/9	19:05	11:25am	11:35am	11:45am
37	A38/7	19:06	11:31am	11:41am	11:51am
38	B40/9	19:06	11:37am	11:47am	11:57am
39	A40/7	19:06	11:43am	11:53am	12:03pm
40	B42/9	19:06	11:50am	12:00pm	12:10pm
41	A42/7	19:06	11:56am	12:06pm	12:16pm
42	B44/9	19:06	12:02pm	12:12pm	12:22pm
43	A44/7	19:06	12:08pm	12:18pm	12:28pm
44	B46/9	19:06	12:14pm	12:24pm	12:34pm
45	A46/7	19:06	12:20pm	12:30pm	12:40pm
46	B48/9	19:06	12:26pm	12:36pm	12:46pm
47	A48/7	19:07	12:33pm	12:43pm	12:53pm
48	B50/9	19:07	12:39pm	12:49pm	12:59pm
49	A50/7	19:07	12:45pm	12:55pm	1:05pm
50	B52/9	19:07	12:51pm	1:01pm	1:11pm
51	A52/7	19:07	12:57pm	1:07pm	1:17pm
52	B54/9	19:07	1:03pm	1:13pm	1:23pm
53	A54/7	19:07	1:09pm	1:19pm	1:29pm
54	B56/9	19:06	1:16pm	1:26pm	1:36pm
55	A56/7	19:06	1:22pm	1:32pm	1:42pm
56	B58/9	19:06	1:28pm	1:38pm	1:48pm
57	A58/7	19:06	1:34pm	1:44pm	1:54pm
58	B60/9	19:06	1:40pm	1:50pm	2:00pm
59	A60/7	19:06	1:46pm	1:56pm	2:06pm
60	B62/9	19:06	1:53pm	2:03pm	2:13pm
61	A62/7	19:06	1:59pm	2:09pm	2:19pm
62	B64/9	19:06	2:05pm	2:15pm	2:25pm
63	A64/7	19:06	2:11pm	2:21pm	2:31pm
64	B66/9	19:06	2:17pm	2:27pm	2:37pm
65	A66/7	19:06	2:23pm	2:33pm	2:43pm
66	B68/9	19:06	2:29pm	2:39pm	2:49pm
67	A68/7	19:06	2:36pm	2:46pm	2:56pm
68	B70/9	19:06	2:42pm	2:52pm	3:02pm
69	A70/7	19:06	2:48pm	2:58pm	3:08pm
70	B72/9	19:06	2:54pm	3:04pm	3:14pm
71	A72/7	19:06	3:00pm	3:10pm	3:20pm
72	B74/9	19:06	3:06pm	3:16pm	3:26pm
73	A74/7	19:06	3:13pm	3:23pm	3:33pm
74	B76/9	19:06	3:19pm	3:29pm	3:39pm
75	A76/7	19:06	3:25pm	3:35pm	3:45pm
76	B78/9	19:06	3:31pm	3:41pm	3:51pm
77	A78/7	19:06	3:37pm	3:47pm	3:57pm
78	B80/9	19:06	3:43pm	3:53pm	4:03pm
79	A80/7	19:06	3:50pm	4:00pm	4:10pm
80	B82/9	19:06	3:56pm	4:06pm	4:16pm
81	A82/7	19:06	4:02pm	4:12pm	4:22pm
82	B84/9	19:06	4:08pm	4:18pm	4:28pm
83	A84/7	19:06	4:14pm	4:24pm	4:34pm
84	B86/9	19:06	4:20pm	4:30pm	4:40pm
85	A86/7	19:06	4:26pm	4:36pm	4:46pm
86	B88/9	19:06	4:33pm	4:43pm	4:53pm
87	A88/7	19:06	4:39pm	4:49pm	4:59pm
88	B90/9	19:06	4:45pm	4:55pm	5:05pm
89	A90/7	19:06	4:51pm	5:01pm	5:11pm
90	B92/9	19:06	4:57pm	5:07pm	5:17pm
91	A92/7	19:06	5:03pm	5:13pm	5:23pm
92	B94/9	19:06	5:09pm	5:19pm	5:29pm
93	A94/7	19:06	5:15pm	5:25pm	5:35pm
94	B96/9	19:06	5:21pm	5:31pm	5:41pm
95	A96/7	19:06	5:27pm	5:37pm	5:47pm
96	B98/9	19:06	5:33pm	5:43pm	5:53pm

PASS_n - B3//7

PUSHING SCHEDULE

Thursday, October 8, 1992 Turn 1
Batteries: 7-9_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	B19/9	19:06	11:50pm	12:00am	12:10a
2	A19/9	19:06	11:56pm	12:06am	12:16a
3	B21/7	19:11	12:02am	12:12am	12:22a
4	B21/9	19:11	12:08am	12:18am	12:28a
5	A21/7	19:11	12:14am	12:24am	12:34a
6	A21/9	19:11	12:20am	12:30am	12:40a
7	B23/7	19:11	12:26am	12:36am	12:46a
8	B23/9	19:11	12:32am	12:42am	12:52a
9	A23/7	19:11	12:38am	12:48am	12:58a
10	A23/9	19:11	12:44am	12:54am	1:04a
11	B25/7	19:11	12:50am	1:00am	1:10a
12	B25/9	19:11	12:56am	1:06am	1:16a
13	A25/7	19:11	1:02am	1:12am	1:22a
14	A25/9	19:11	1:08am	1:18am	1:28a
15	B27/7	19:11	1:14am	1:24am	1:34a
16	B27/9	19:11	1:20am	1:30am	1:40a
17	A27/7	19:11	1:26am	1:36am	1:46a
18	A27/9	19:11	1:32am	1:42am	1:52a
19	B29/7	19:11	1:38am	1:48am	1:58a
20	B29/9	19:11	1:44am	1:54am	2:04a
21	A29/7	19:11	1:50am	2:00am	2:10a
22	A29/9	19:11	1:56am	2:06am	2:16a
23	B31/7	19:11	2:02am	2:12am	2:22a
24	B31/9	19:11	2:08am	2:18am	2:28a
25	A31/7	19:11	2:14am	2:24am	2:34a
26	A31/9	19:11	2:20am	2:30am	2:40a
27	B33/7	19:11	2:26am	2:36am	2:46a
28	B33/9	19:11	2:32am	2:42am	2:52a
29	A33/7	19:11	2:38am	2:48am	2:58a
30	A33/9	19:11	2:44am	2:54am	3:04a
31	B35/7	19:11	2:50am	3:00am	3:10a
32	B35/9	19:11	2:56am	3:06am	3:16a
33	A35/7	19:11	3:02am	3:12am	3:22a
34	A35/9	19:11	3:08am	3:18am	3:28a
35	B37/7	19:11	3:14am	3:24am	3:34a
36	B37/9	19:11	3:20am	3:30am	3:40a
37	A37/7	19:11	3:26am	3:36am	3:46a
38	A37/9	19:11	3:32am	3:42am	3:52a
39	B39/7	19:11	3:38am	3:48am	3:58a
40	B39/9	19:11	3:44am	3:54am	4:04a
41	A39/7	19:11	3:50am	4:00am	4:10a
42	A39/9	19:11	3:56am	4:06am	4:16a
43	B41/7	19:11	4:02am	4:12am	4:22a
44	B41/9	19:11	4:08am	4:18am	4:28a
45	A41/7	19:11	4:14am	4:24am	4:34a
46	A41/9	19:10	4:20am	4:30am	4:40a
47	B43/7	19:10	4:26am	4:36am	4:46a
48	B43/9	19:10	4:32am	4:42am	4:52a
49	A43/7	19:10	4:38am	4:48am	4:58a
50	A43/9	19:10	4:44am	4:54am	5:04a
51	B45/7	19:10	4:50am	5:00am	5:10a
52	B45/9	19:10	4:56am	5:06am	5:16a
53	A45/7	19:09	5:02am	5:12am	5:22a
54	A45/9	19:09	5:08am	5:18am	5:28a
55	B47/7	19:09	5:14am	5:24am	5:34a
56	B47/9	19:09	5:20am	5:30am	5:40a
57	A47/7	19:09	5:26am	5:36am	5:46a
58	A47/9	19:09	5:32am	5:42am	5:52a
59	B49/7	19:08	5:38am	5:48am	5:58a
60	B49/9	19:08	5:44am	5:54am	6:04a
61	A49/7	19:08	5:50am	6:00am	6:10a
62	A49/9	19:08	5:56am	6:06am	6:16a
63	B51/7	19:08	6:02am	6:12am	6:22a
64	B51/9	19:08	6:08am	6:18am	6:28a
65	A51/7	19:07	6:14am	6:24am	6:34a
66	A51/9	19:07	6:20am	6:30am	6:40a
67	B53/7	19:07	6:26am	6:36am	6:46a
68	B53/9	19:07	6:32am	6:42am	6:52a
69	A53/7	19:07	6:38am	6:48am	6:58a
70	A53/9	19:07	6:44am	6:54am	7:04a
71	B55/7	19:07	6:50am	7:00am	7:10a
72	B55/9	19:06	6:56am	7:06am	7:16a
73	A55/7	19:06	7:02am	7:12am	7:22a
74	A55/9	19:06	7:08am	7:18am	7:28a
75	B57/7	19:06	7:14am	7:24am	7:34a
76	B57/9	19:06	7:20am	7:30am	7:40a
77	A57/7	19:06	7:26am	7:36am	7:46a
78	A57/9	19:05	7:32am	7:42am	7:52a
79	B59/7	19:05	7:38am	7:48am	7:58a
80	B59/9	19:05	7:44am	7:54am	8:04a

PUSHING SCHEDULE

Friday. October 9, 1992 Turn 3
Batteries: 7-9 2

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

PUSHING SCHEDULE

Friday, October 9, 1992 Turn 2
Batteries: 7-9 2

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

PUSHING SCHEDULE

Friday, October 9, 1992 Turn 1
Batteries: 7-9_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	A30/9	19:36	11:50pm	12:00am	12:10a
2	B30/7	19:36	11:56pm	12:06am	12:16a
3	A1 /9	19:36	12:02am	12:12am	12:22a
4	B1 /8	19:36	12:08am	12:18am	12:28a
5	A2 /9	19:36	12:14am	12:24am	12:34a
6	B2 /8	19:36	12:20am	12:30am	12:40a
7	A25 /9	19:36	12:26am	12:36am	12:46a
8	B31 /7	19:42	12:32am	12:42am	12:52a
9	B5 /8	19:42	12:38am	12:48am	12:58a
10	A7 /9	19:42	12:44am	12:54am	1:04a
11	B7 /8	19:42	12:50am	1:00am	1:10a
12	A9 /9	19:42	12:56am	1:06am	1:16a
13	B9 /8	19:42	1:02am	1:12am	1:22a
14	A11/9	19:42	1:08am	1:18am	1:28a
15	B11/8	19:42	1:14am	1:24am	1:34a
16	A13/9	19:42	1:20am	1:30am	1:40a
17	B13/8	19:42	1:26am	1:36am	1:46a
18	A15/9	19:42	1:32am	1:42am	1:52a
19	B15/8	19:42	1:38am	1:48am	1:58a
20	A17/9	19:50	1:44am	1:54am	2:04a
21	B17/8	19:50	1:50am	2:00am	2:10a
22	A19/9	19:50	1:56am	2:06am	2:16a
23	B19/8	19:49	2:02am	2:12am	2:22a
24	A21/9	19:47	2:08am	2:18am	2:28a
25	B21/8	19:49	2:14am	2:24am	2:34a
26	A23/9	19:49	2:20am	2:30am	2:40a
27	B23/8	19:49	2:26am	2:36am	2:46a
28	A26/9	19:49	2:32am	2:42am	2:52a
29	B26/8	19:48	2:38am	2:48am	2:58a
30	A27/9	19:48	2:44am	2:54am	3:04a
31	B27/8	19:48	2:50am	3:00am	3:10a
32	A29/9	19:48	2:56am	3:06am	3:16a
33	B29/8	19:48	3:02am	3:12am	3:22a
34	A31/9	19:48	3:08am	3:18am	3:28a
35	B31/8	19:48	3:14am	3:24am	3:34a
36	C1 /8	19:47	3:20am	3:30am	3:40a
37	B22 /7	19:42	3:26am	3:36am	3:46a
38	B24 /7	19:42	3:32am	3:42am	3:52a
39	A4 /7	19:42	3:38am	3:48am	3:58a
40	B6 /7	19:42	3:44am	3:54am	4:04a
41	A5 /7	19:42	3:50am	4:00am	4:10a
42	B8 /7	19:42	3:56am	4:06am	4:16a
43	A8 /7	19:42	4:02am	4:12am	4:22a
44	B10/9	19:41	4:08am	4:18am	4:28a
45	A10/7	19:41	4:14am	4:24am	4:34a
46	B12/9	19:41	4:20am	4:30am	4:40a
47	A12/7	19:41	4:26am	4:36am	4:46a
48	B14/9	19:41	4:32am	4:42am	4:52a
49	A14/7	19:41	4:38am	4:48am	4:58a
50	B16/9	19:40	4:44am	4:54am	5:04a
51	A16/7	19:40	4:50am	5:00am	5:10a
52	B18/9	19:40	4:56am	5:06am	5:16a
53	A18/7	19:40	5:02am	5:12am	5:22a
54	B20/9	19:40	5:08am	5:18am	5:28a
55	A20/7	19:40	5:14am	5:24am	5:34a
56	B22/9	19:40	5:20am	5:30am	5:40a
57	A22/7	19:40	5:26am	5:36am	5:46a
58	B24/9	19:39	5:32am	5:42am	5:52a
59	A24/7	19:39	5:38am	5:48am	5:58a
60	B26/9	19:39	5:44am	5:54am	6:04a
61	A26/7	19:39	5:50am	6:00am	6:10a
62	B28/9	19:39	5:56am	6:06am	6:16a
63	A28/7	19:39	6:02am	6:12am	6:22a
64	B30/9	19:39	6:08am	6:18am	6:28a
65	A30/7	19:39	6:14am	6:24am	6:34a
66	B31/7	19:39	6:20am	6:30am	6:40a
67	A31/7	19:39	6:26am	6:36am	6:46a
68	B27 /7	19:39	6:32am	6:42am	6:52a
69	B29 /7	19:39	6:38am	6:48am	6:58a
70	B17 /7	19:39	6:44am	6:54am	7:04a
71	A17 /7	19:39	6:50am	7:00am	7:10a
72	B25 /7	19:39	6:56am	7:06am	7:16a
73	A25 /7	19:39	7:02am	7:12am	7:22a
74	B3 /7	19:39	7:08am	7:18am	7:28a
75	A3 /7	19:39	7:14am	7:24am	7:34a
76	B9 /7	19:39	7:20am	7:30am	7:40a
77	B19 /7	19:39	7:26am	7:36am	7:46a
78	B11 /7	19:39	7:32am	7:42am	7:52a
79	A13 /7	19:39	7:38am	7:48am	7:58a
80	B13 /7	19:39	7:44am	7:54am	8:04a

COMPLIANCE DEMONSTRATION
#9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PA

APPENDIX C

CALIBRATION RESULTS

KEYSTONE
ENVIRONMENTAL RESOURCES, INC

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 6 BP 29.2 in. Hg
DATE 05-20-92 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	29.20				0.50	777.500		
HALF		72.0			94.0	83.0	88.5				
STOP	13.40		5.000						782.822		
CALCULATION	13.40	532.0	5.013	29.20			548.5	29.24	5.322	0.9698	2.002
START			0.000	29.20				1.00	783.500		
HALF		72.0			96.0	85.0	90.5				
STOP	9.46		5.000						788.954		
CALCULATION	9.46	532.0	5.013	29.20			550.5	29.27	5.454	0.9486	1.988
START			0.000	29.20				2.00	789.800		
HALF		72.0			109.0	89.0	99.0				
STOP	6.70		5.000						795.222		
CALCULATION	6.70	532.0	5.013	29.20			559.0	29.35	5.422	0.9665	1.964
AVERAGE										0.9617	1.985

POST TEST

BOX # 6 BP 28.65 in. Hg
DATE 11-2-92 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	Δ H@
START			0.000	28.65				1.50	408.000		
HALF		70.0			95.0	75.0	85.0				
STOP	7.47		5.000						413.291		
CALCULATION	7.47	530.0	5.013	28.65			545.0	28.76	5.291	0.9704	1.900
START			0.000	28.65				1.50	413.600		
HALF		70.0			100.0	80.0	90.0				
STOP	7.48		5.000						418.892		
CALCULATION	7.48	530.0	5.013	28.65			550.0	28.76	5.292	0.9792	1.888
START			0.000	28.65				1.50	419.400		
HALF		70.0			105.0	85.0	95.0				
STOP	7.50		5.000						424.715		
CALCULATION	7.50	530.0	5.013	28.65			555.0	28.76	5.315	0.9838	1.881
AVERAGE										0.9778	1.889
DIFFERENCE										-1.6%	5.0%

PRE-TEST MAGNEHELIC CALIBRATION

BOX# 6
DATE 05-20-92
OPERATOR RPC

0 to 10" H2O RANGE

MAGNEHELIC Δ P	MANOMETER
0.50	0.50
1.00	1.00
2.00	2.00
4.00	4.00
6.00	6.00
8.00	8.00

0 to 0.50" H2O RANGE

MAGNEHELIC Δ P	MANOMETER
0.50	---
0.40	---
0.30	---
0.20	---
0.10	---

Calibration not necessary.
Primary standard on control box.

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 05-20-92
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	776.425	776.572	0.147	10.000	-0.002
WET	0.000	0.131	0.131		

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

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	400.0
10.57	500	500.0

PRE-TEST PYROMETER CHECK

DATE 05-20-92
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	41.0
0.40	50	51.0
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	399.0
10.57	500	500.0

POST-TEST MAGNEHELIC CALIBRATION

BOX# 6
DATE 11-02-92
OPERATOR RPC

0 to 10" H2O RANGE

MAGNEHELIC Δ P	MANOMETER
0.50	0.50
1.00	1.00
2.00	2.00
4.00	4.00
6.00	6.00
8.00	8.00

0 to 0.50" H2O RANGE

MAGNEHELIC Δ P	MANOMETER
0.50	---
0.40	---
0.30	---
0.20	---
0.10	---

Calibration not necessary.
Primary standard on control box.

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 9-3-92
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	401.290	401.410	0.120	10.000	0.0001
WET	0.000	0.121	0.121		

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

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	400.0
10.57	500	500.0

POST-TEST PYROMETER CHECK

DATE 9-3-92
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	151.0
3.82	200	200.0
6.09	300	300.0
8.31	400	402.0
10.57	500	502.0

QA ORIFICE AUDIT

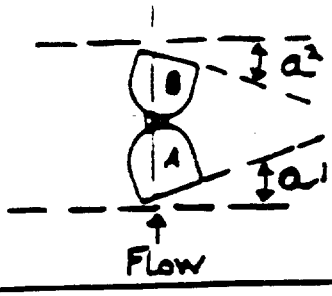
ORIFICE	BAPC-3	DATE	10-27-92	B.P.	28.80
OPERATOR	RPC	BOX #	6		

RUN	1		2		3	
INITIAL CF	374.300		382.200		390.100	
FINAL CF	381.841		389.751		397.662	
DIFFERENCE	7.541		7.551		7.562	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	77	77	81	77	85	79
TEMP 5 MIN	79	77	84	77	87	80
TEMP 10 MIN	79	77	84	79	89	81
TEMP 15 MIN	81	77	85	79	89	82
		TEMP R		TEMP R		TEMP R
TEMP AVG	78	538	80.75	540.75	84	544
TIME (MIN.)	15.00		15.00		15.00	
	IN WATE	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.70	0.05	0.70	0.05	0.70	0.05
METER PRESSURE		28.85		28.85		28.85
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	78.0	25.6	80.0	26.7	84.0	28.9
VACUUM IN HG	18.0		18.0		18.0	
DGM CAL Y	0.9617		0.9617		0.9617	
STD CF	6.889		6.863		6.832	
STD CUBIC METERS	0.1951		0.1944		0.1935	

GEOMETRIC PITOT CALIBRATION

Caliper # XCF-59
Precheck ✓
Post Check

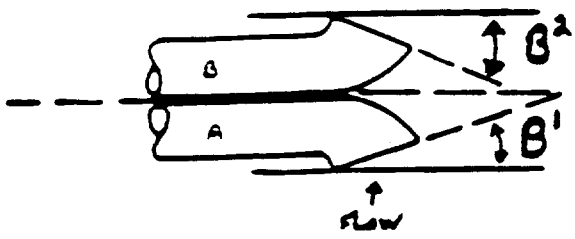
Probe #: 10-1
Date: 9-10-92
Initials: RM

① 

a^1 = 1.0°
a^2 = 0.5°
a^1, a^2 = <10°

B^1 = 4.0°
B^2 = 3.0°
B^1, B^2, = <5°

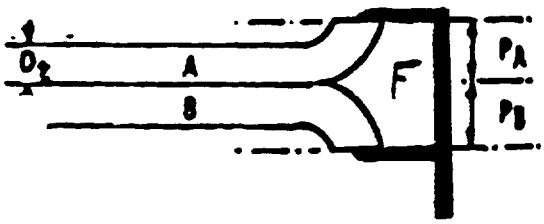
F = 0.970"

② 

μ = 0.0169" — μ = ≤ 0.1250" ($\mu = F \tan\gamma$)

V = 0.0169" — V = ≤0.03125" ($V = F \tan\theta$)

W = 0.408 — W ≥ 0"

③ 

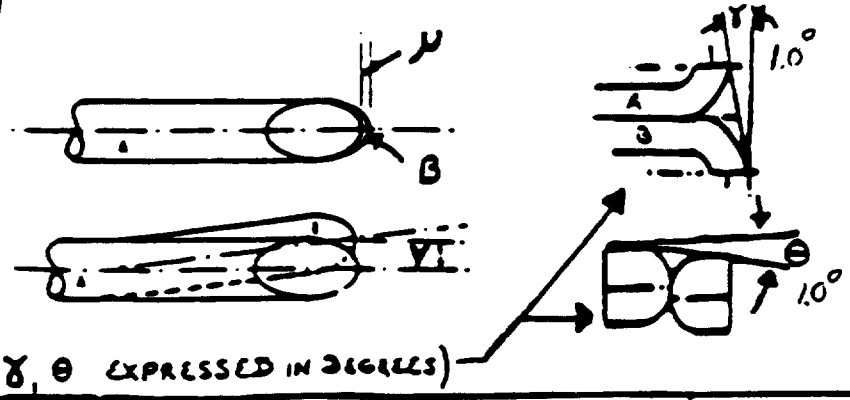
1.05 D_t < A < 1.50 D_t
$P_A = P_B$
2.10 D_t < B < 3.00 D_t

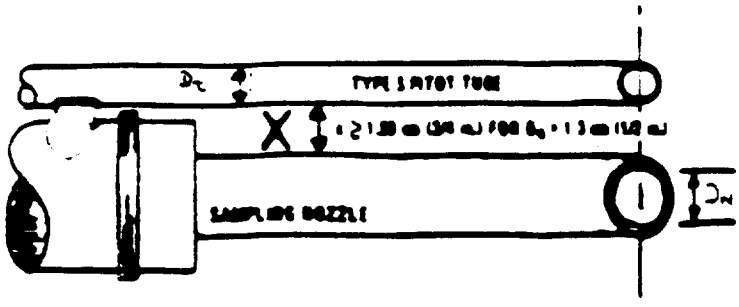
X = 0.783 — X ≥ 0.750" (3/4" using 1/2" nozzle)

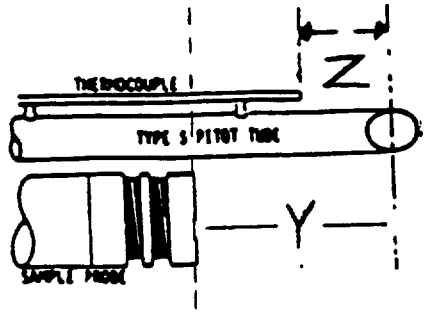
Y = 6.138 — Y ≥ 3.0"

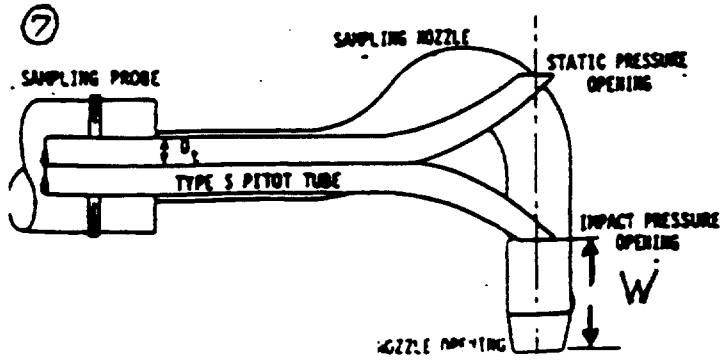
Z = 2.980 — Z > 2.0"

D_t = 0.375 — D_t > .1875" to .375" (3/16" to 3/8")

④ 

⑤ 

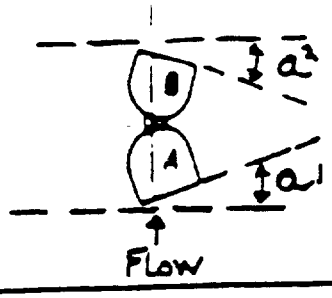
⑥ 

⑦ 

GEOMETRIC PITOT CALIBRATION

Caliper # XFS·68 Probe #: 10-1
Precheck Date: 11·2·92
Post Check ✓ Initials: [illegible]

①

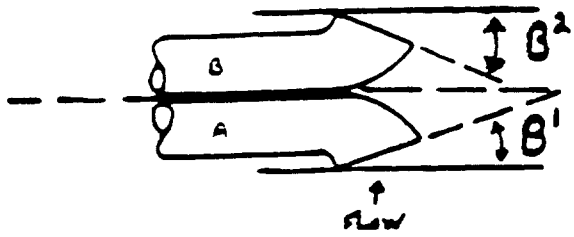


a^1 = 4.0°
a^2 = 4.0°
a^1, a^2 = <10°

B^1 = 2.0°
B^2 = 3.5°
B^1, B^2, = <5°

F = 0.952"

②



μ = 0.0146 μ = ≤ 0.1250" (μ = F TAN γ)

V = 0.0146 V = ≤0.03125" (V = F TAN θ))

W = 0.438 W ≥ 0"

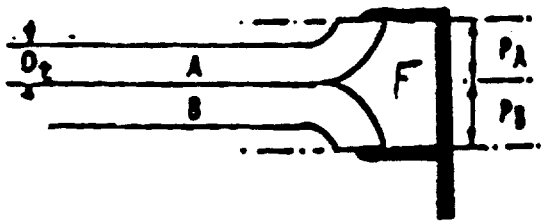
X = 0.844 X ≥ 0.750" (3/4" using 1/2" nozzle)

Y = 6.324 Y ≥ 3.0"

Z = 2.956 Z > 2.0"

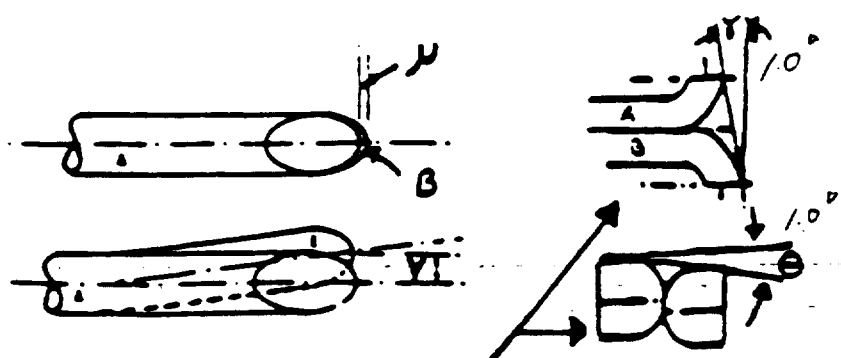
D_t = 0.375 D_t > .1875" to .375" (3/16" to 3/8")

③



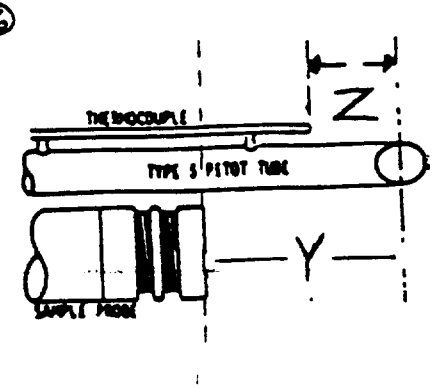
1.05 D_t < A < 1.50 D_t
$P_A = P_B$
2.10 D_t < A < 3.00 D_t

④

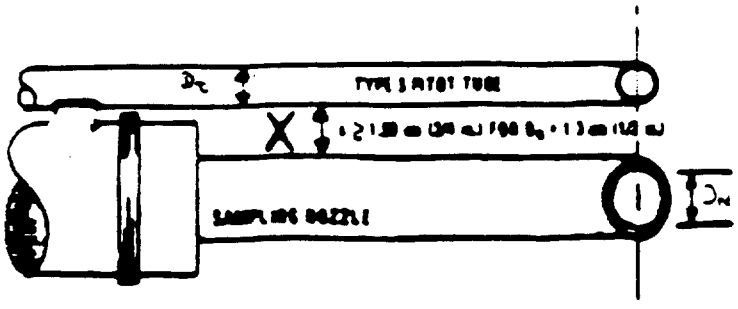


(γ, θ EXPRESSED IN DEGREES)

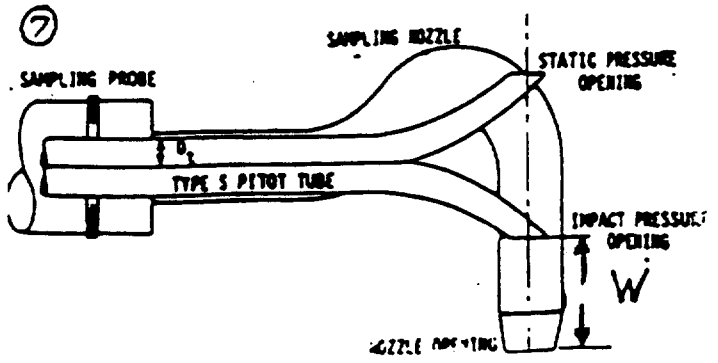
⑥



⑤



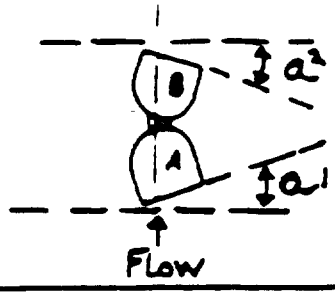
⑦



GEOMETRIC PITOT CALIBRATION

Caliper # KEF-59
Precheck ✓
Post Check

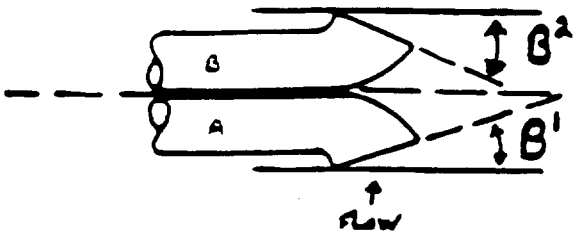
Probe #: 10-2
Date: 9-10-92
Initials: TJM

① 

a^1 = 4.0°
a^2 = 1.0°
a^1, a^2 = <10°

B^1 = 0°
B^2 = 0°
B^1, B^2, = <5°

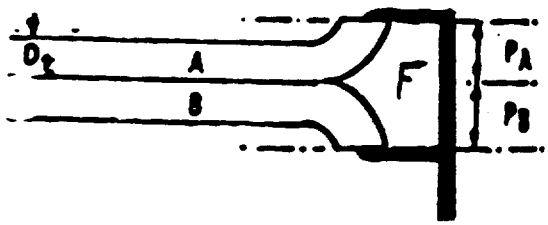
F = 0.909"

② 

μ = 0.0159"
μ = ≤ 0.1250" (μ = F TAN γ)

V = Ø
V = ≤0.03125" (V = F TAN θ)

W = 0.328
W ≥ 0"

③ 

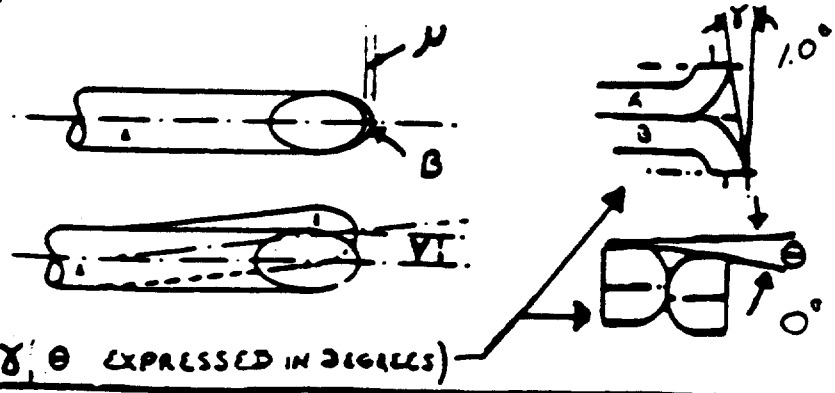
1.05 D_t < A < 1.50 D_t
P_A = P_B
2.10 D_t < A < 3.00 D_t

X = 1.048
X ≥ 0.750"
(3/4" using 1/2" nozzle)

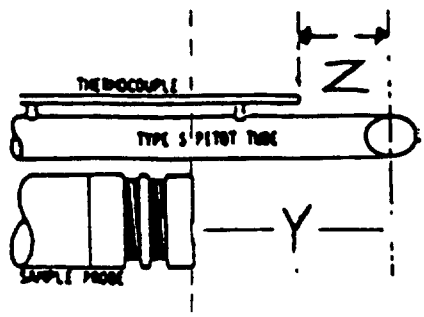
Y = 5.608
Y ≥ 3.0"

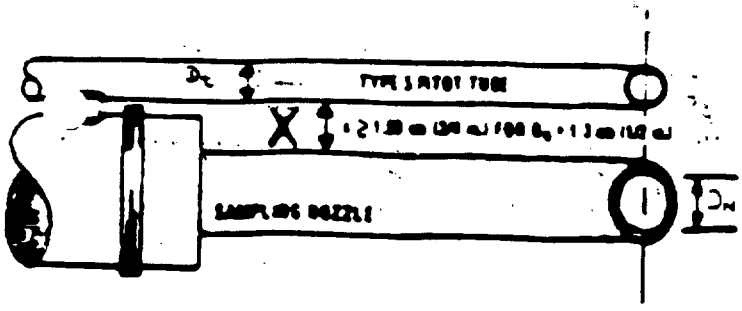
Z = 2.270
Z > 2.0"

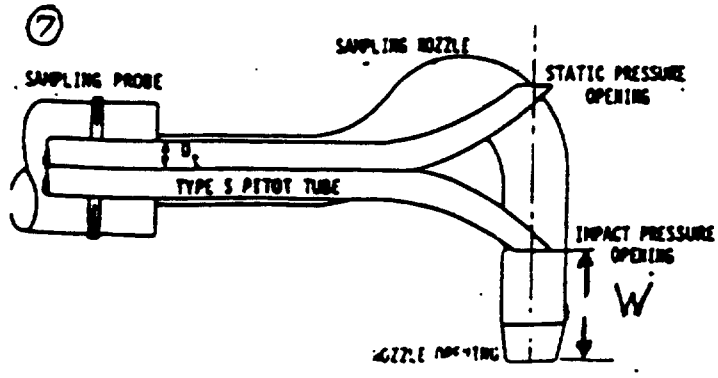
D_t = 0.375
D_t > .1875" to .375"
(3/16" to 3/8")

④ 

(γ, θ EXPRESSED IN DEGREES)

⑥ 

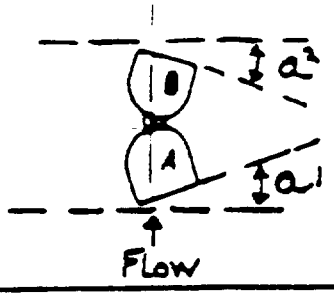
⑤ 

⑦ 

GEOMETRIC PITOT CALIBRATION

Caliper # XFS-68
Precheck
Post Check X

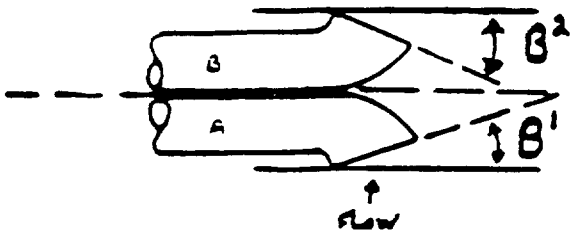
Probe #: 10-S
Date: 11-2-92
Initials: AM

① 

a^1 = 3.5°
a^2 = 1.0°
a^1, a^2 = <10°

B^1 = 2.0
B^2 = 0
B^1, B^2, = <5°

F = 0.932"

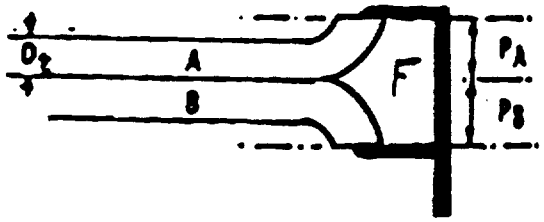
② 

μ = 0 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0 — V = ≤0.03125" (V = F TAN θ)

W = 0.286 — W ≥ 0"

X = 0.943 — X ≥ 0.750" (3/4" using 1/2" nozzle)

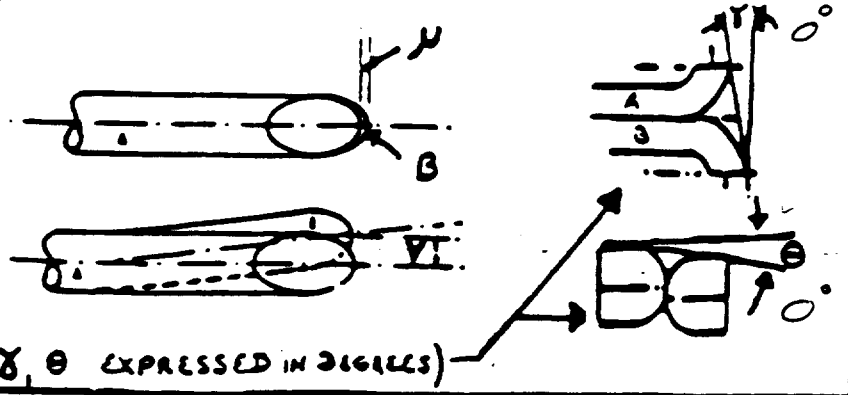
③ 

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

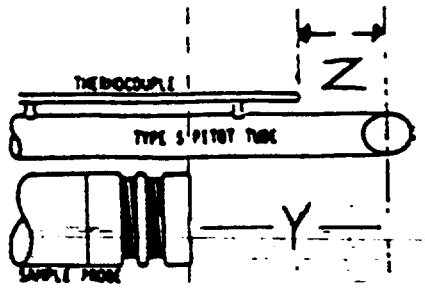
Y = 5.589 — Y ≥ 3.0"

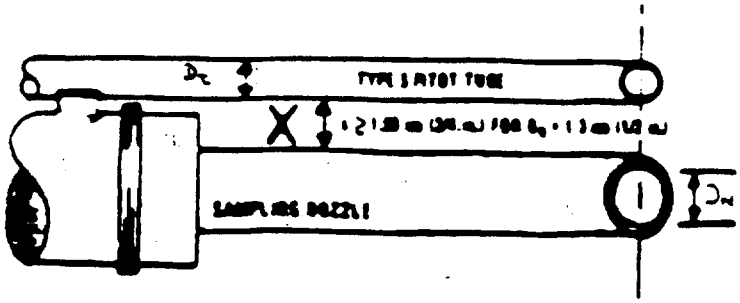
Z = 3.206 — Z > 2.0"

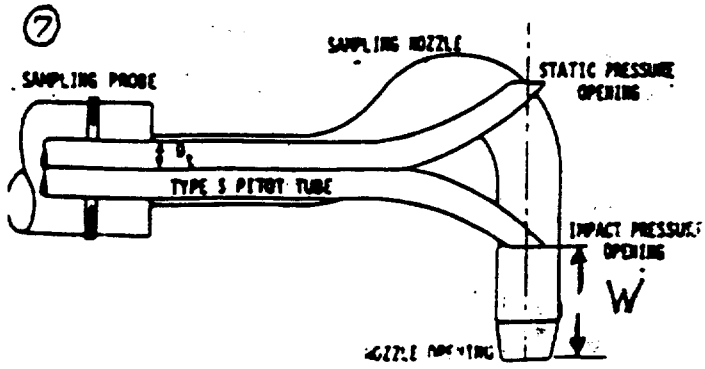
D_t = 0.376 — D_t > .1875" to .375" (3/16" to 3/8")

④ 

(γ, θ EXPRESSED IN DEGREES)

⑥ 

⑤ 

⑦ 

COMPLIANCE DEMONSTRATION
#9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PA

APPENDIX D

FIELD DATA SHEETS

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

D/0

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works
TEST UNIT #9 Battery Stack
PROJECT NO. 60504B-01
TEST CREW DB, MV, & RC
BAROMETRIC PRESSURE 29.35

TEST DATE 10-8-92
TEST NO. CLR-9BS-1
NOZZLE (SIZE,#) 0.435
STATIC PRESSURE -1.0
PORT DIRECTION S/W/N

ORIFICE CORRECTION (ΔH@) 1.985
METER CORRECTION (Y) 0.9617
CALIBRATION DATE 5-20-92
PITOT CORRECTION 0.84
CONTROL BOX NO. 6

HOT/COLD BOX NO. 3
PROBE NO. 10-1
FILTER NO. ~~435~~ 935 DEB
STACK DIA. 114"
PORT SIZE 4" Bolted 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
S	40.6	853	847.818	0.11	1.97	2.00	47	48	5.0	490	240	51	250	5 min./point
	28.5	5		0.10	1.79	1.80	69	49	5.0	490				
	20.2	10		0.10	1.79	1.80	75	52	5.0	499		46		
	13.5	15		0.08	1.48	1.50	81	55	4.0	509	235		250	
	7.6	20		0.06	1.11	1.10	81	57	3.5	498				
S	2.4	823 25	867.891	0.02	0.37	0.35	79	59	2.5	497				
W	40.6	933	867.891	~~0.00~~ 0.09	~~0~~ 1.66	1.65	77	60	4.0	490				
	28.5			0.08	1.48	1.50	82	61	4.0	499				
	20.2			0.08	1.48	1.50	84	62	4.0	501				
	13.5			0.06	1.1	1.1	85	64	3.5	500				
	7.6			0.07	1.29	1.30	89	65	4.0	496				
W	2.4	1003	887.062	0.01	0.18	0.20	83	69	2.5	501				
N	40.6	1010	887.062	0.09	1.66	1.65	80	67	4.5	505				
	28.5			0.09	1.66	1.65	89	69	4.0	519				
	20.2			0.12	2.21	2.20	92	69	5.0	506				
	13.5			0.08	1.48	1.50	90	70	4.0	503				Estimates:
	7.6			0.01	0.18	0.20	85	70	2.5	495				MW= 28.0
N	2.4	1040	906.629	0.01	0.18	0.20	86	70	2.5	501				%H2O=13.6

SYSTEM LEAK CHECK

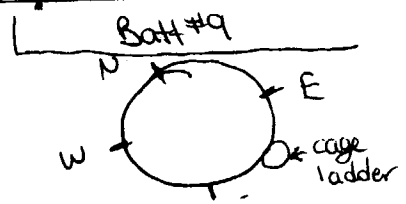
	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.015
After	5.0	0.006

PITOT LEAK CHECK 15sec

	Positive	Negative
Before	OK	OK
After		

GAS	1	2
CO2	4.0	4.5
O2	13.5	13.5
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI H_2O	633.8	538.0	95.8
2.	100mL DI H_2O	606.8	574.0	32.8
3.	Empty	446.3	442.5	3.8
4.	Silica Gel	674.0	657.7	16.3
5.				



AQE 6/92

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works | TEST DATE 10-8-92 | ORIFICE CORRECTION (ΔH@) 1.985 | HOT/COLD BOX NO. 3
TEST UNIT #9 Battery Stack | TEST NO. CLR-9B5-1 | METER CORRECTION (Y) 0.9617 | PROBE NO. 10-1
PROJECT NO. 60504B-01 | NOZZLE (SIZE,#) 0.435 | CALIBRATION DATE 5-20-92 | FILTER NO. 935
TEST CREW MV, RC, & OB | STATIC PRESSURE -1.0 | PITOT CORRECTION 0.84 | STACK DIA. 114"
BAROMETRIC PRESSURE 29.35 | PORT DIRECTION E | CONTROL BOX NO. 6 | PORT SIZE 4"

	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
E	40.6	1048	906.629	0.10	1.84	1.85	83	70	4.5	505				5 min./point
	28.5			0.10	1.84	1.85	91	70	4.5	521				
	20.2			0.09	1.66	1.65	95	71	4.0	491				
	13.5	15		0.08	1.48	1.50	95	73	4.5	495				
	7.6	20		0.08	1.48	1.50	99	74	4.0	497				
E	2.4	1118	927.743	0.03	0.55	0.55	95	75	3.0	505				
														Estimates:
														MW= 28.0
														%H2O= 13.6

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	~~5.0~~	~~0.018~~
After		

JEB

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI H2O			
2.	100 mL DI H2O			
3.	Empty			
4.	Silica Gel			
5.				

5/0

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

0.9617 JEB

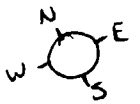
CLIENT USS Clairton Works	TEST DATE 10-8-92	ORIFICE CORRECTION (ΔH@) 1.986	HOT/COLD BOX NO. 5
TEST UNIT #9 Battery Stack	TEST NO. CLR-9B5-2	METER CORRECTION (Y) ~~0.9761~~	PROBE NO. 10-2
PROJECT NO. 6050FB-01	NOZZLE (SIZE,#) 0.435	CALIBRATION DATE 5-20-92	FILTER NO. 939
TEST CREW DB, MV & RC	STATIC PRESSURE -1.0	PITOT CORRECTION 0.84	STACK DIA. 114"
BAROMETRIC PRESSURE 29.25	PORT DIRECTION E/N/W	CONTROL BOX NO. 6	PORT SIZE 4" Bolted Flange

	Traverse Point (inches)	Time 1504 ~~1504~~	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
E	40.6	~~354~~	938.410	0.07	1.29	1.30	84	79	3.0	476	≤250	60	250	5 min./point
	28.5			0.06	1.11	1.10	94	79	2.5	486				
	20.2			0.06	1.11	1.10	102	82	2.5	490		56		
	13.5			0.05	0.92	0.90	105	84	2.0	446	230			
	7.6			0.07	1.29	1.30	109	87	3.0	481		49		
E	2.4	1534	946.651	0.06	1.11	1.10	111	89	2.5	492				
N	40.6	1546	946.651	0.07	1.29	1.30	93	85	3.0	490				
	28.5			0.07	1.29	1.30	105	85	3.0	499	235	53		
	20.2			0.06	1.11	1.10	109	87	2.5	471				
	13.5			0.05	0.92	0.92	109	87	2.5	469		55		
	7.6			0.06	1.11	1.10	111	90	2.5	480		56		
N	2.4	1616	964.695	0.01	0.18	0.20	105	91	2.0	487				
W	40.6	1625	964.695	0.08	1.48	1.50	89	89	3.5	491				
	28.5	5		0.08	1.48	1.50	111	91	3.5	470				
	20.2	10		0.07	1.29	1.30	114	93	3.0	482				
	13.5	15		0.06	1.11	1.10	115	94	3.0	487				Estimates:
	7.6	20		0.10	1.84	1.85	117	94	4.0	467		63		MW= 28.0
W	2.4	1655	985.487	0.08	1.48	1.50	118	95	3.5	481				%H2O=13.6

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.018
After	5.0	0.010

#9 Battery



PITOT LEAK CHECK 15sec

	Positive	Negative
Before	OK	OK
After	OK	OK

GAS	1	2
CO2	13.5	14.0
O2	3.0	3.0
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI H2O	712.7	572.3	140.4
2.	100mL DI H2O	600.9	572.2	28.7
3.	Empty	454.3	451.1	3.2
4.	Silica Gel	683.4	668.9	14.5
5.				

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	**TEST DATE** 10-8-92	**ORIFICE CORRECTION (ΔH@)** 1.985	**HOT/COLD BOX NO.** 5
TEST UNIT #9 Battery Stack	**TEST NO.** CLR-9B5-2	**METER CORRECTION (Y)** 0.9617	**PROBE NO.** 10-2
PROJECT NO. 60504B-01	**NOZZLE (SIZE,#)** 0.435	**CALIBRATION DATE** 5-20-92	**FILTER NO.** 939
TEST CREW MV, RC, & DB	**STATIC PRESSURE** -1.0	**PITOT CORRECTION** 0.84	**STACK DIA.** 114"
BAROMETRIC PRESSURE 29.25	**PORT DIRECTION** S	**CONTROL BOX NO.** 6	**PORT SIZE** 4"

	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
S	40.6	1702	985.487	0.08	1.48	1.50	99	94	3.5	494				5 min./point
	28.5	07		0.09	1.66	1.65	110	94	3.5	497				
	20.2	12		0.08	1.48	1.50	113	93	3.5	498				
	13.5	17		0.06	1.11	1.10	114	94	3.0	502				
	7.6	22		0.09	1.66	1.65	115	94	3.5	485				
S	2.4	1732	1006.381	0.09	1.66	1.65	115	95	4.0	491				
														Estimates:
														MW= 28.0
														%H2O= 13.6

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.	100mL DI H2O			
2.	100 mL DI H2O			
3.	Empty			
4.	Silica Gel			
5.				

5/0

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 10-8-92	ORIFICE CORRECTION (ΔH@) 1.985	HOT/COLD BOX NO. 8
TEST UNIT #9 Battery Stack	TEST NO. CLR-9B5-#3	METER CORRECTION (Y) 0.9617	PROBE NO. 10-1
PROJECT NO. 6050A8-01	NOZZLE (SIZE,#) 0.435	CALIBRATION DATE 5-20-92	FILTER NO. 938
TEST CREW DB, MV & RC	STATIC PRESSURE -1.0	PITOT CORRECTION 0.84	STACK DIA. 114"
BAROMETRIC PRESSURE 29.20	PORT DIRECTION S/W/N	CONTROL BOX NO. 6	PORT SIZE 4" Bolted Flange

	Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	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
S	40.6	1208	006.673	0.09	1.66	1.65	71	65	3.0	523	250	55	250	5 min./point
	28.5	13		0.08	1.48	1.50	79	65	3.0	529				
	20.2	18		0.07	1.29	1.30	89	67	3.0	535		53	220	
	13.5	23		0.06	1.11	~~1.0~~ 1.10	91	69	2.5	515				
	7.6	28		0.06	1.11	1.10	94	71	2.5	509		54	225	
S	2.4	1238	025.064	0.01	0.18	0.20	95	73	2.0	511				
W	40.6	1244	025.064	0.09	1.66	1.65	82	73	3.5	505		55		
	28.5			0.08	1.48	1.50	92	73	3.0	520				
	20.2			0.07	1.31	1.30	95	74	3.0	501		53	235	
	13.5			0.08	1.50	1.50	97	75	3.0	502				
	7.6			0.07	1.31	1.30	100	77	2.5	508		53	250	
W	2.4	1314	044.489	0.02	0.38	0.40	95	79	2.0	511				
N	40.6	1320	044.489	0.10	1.88	1.90	90	79	3.5	541		58	250	
	28.5			0.09	1.88	1.90	96	79	3.5	510				
	20.2			0.09	1.69	1.70	101	79	3.5	502		56	240	
	13.5			0.09	1.69	1.70	101	79	3.5	502				Estimates:
	7.6			0.06	1.13	1.10	101	80	2.5	504				MW= 28.0
N	2.4	1350	064.332	0.01	0.19	0.20	95	9880	2.0	508				%H2O=13.6

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.013
After	5.0	0.007

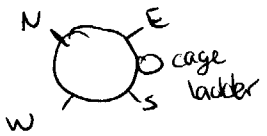
PITOT LEAK CHECK ~~30~~ 15 sec

	Positive	Negative
Before	~~0~~ OK	OK
After		

GAS	1	2
CO2	13.5	13.5
O2	3.0	3.0
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI H2O	718.6	568.8	149.8
2.	100mL DI H2O	593.6	562.6	31.0
3.	Empty	468.9	465.8	3.1
4.	Silica Gel	687.0	672.3	14.7
5.				

#9 Battery



KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 10-8-92	ORIFICE CORRECTION (ΔH@) 1.985	HOT/COLD BOX NO. 8
TEST UNIT #9 Battery Stack	TEST NO. CLR-985-3	METER CORRECTION (Y) 0.9617	PROBE NO. 6-1
PROJECT NO. 60504B-01	NOZZLE (SIZE,#) 0.435	CALIBRATION DATE 5-20-92	FILTER NO. 938
TEST CREW MV, RC, & DB	STATIC PRESSURE -1.0	PITOT CORRECTION 0.84	STACK DIA. 114"
BAROMETRIC PRESSURE 29.20	PORT DIRECTION E	CONTROL BOX NO. 6	PORT SIZE 4" Bolted Flange

	Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	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
E	40.6	1358	064.332	0.09	1.69	1.70	85	79	4.5	504		55	250	5 min./point
	28.5			0.08	1.50	1.50	97	79	3.0	521				
	20.2			0.08	1.50	1.50	99	79	3.0	525				
	13.5			0.07	1.31	1.30	101	80	3.0	527		57	235	
	7.6			0.07	1.31	1.30	102	81	3.0	521				
E	2.4	1428	085.213	0.07	1.31	1.30	104	82	3.0	518		58	230	
														Estimates:
														MW= 28.0
														%H2O= 13.6

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.	100mL DI H_2O			
2.	100 mL DI H_2O			
3.	Empty			
4.	Silica Gel			
5.				

COMPLIANCE DEMONSTRATION
#9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PA

APPENDIX E

EMISSIONS CALCULATIONS

KEYSTONE
ENVIRONMENTAL RESOURCES, INC

KEYSTONE ENVIRONMENTAL RESOURCES
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA
#9 Battery Stack

DATE: 10-8-92
CHARGE #: ...150-605048
TEST #: CLR-BS9-1

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00366	1.31090

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2. STACK CONDITIONS

FLOW (ACFM)	84901.
(SCFM)	45665.
MOISTURE CONTENT (%)	8.57
STACK TEMPERATURE (F)	500.5

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	74.838
PERCENT ISOKINETIC	102.58

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA — #9 Battery Stack
CLR-BS9-1 — 10-8-92

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FFT/SEC
40.6S	853.0	847.818	.110	1.97	2.00	47.	48.	5.0	490.	25.4
28.5			.100	1.79	1.80	69.	49.	5.0	490.	24.3
20.2			.100	1.79	1.80	75.	52.	5.0	499.	24.4
13.5			.080	1.48	1.50	81.	51.	4.0	509.	21.9
7.6			.060	1.11	1.10	81.	57.	3.5	498.	18.9
2.4	923.0	867.891	.020	.37	.35	79.	59.	2.5	497.	10.9
40.6W	933.0	867.891	.090	1.66	1.65	77.	60.	4.0	490.	23.0
28.5			.080	1.48	1.50	82.	61.	4.0	499.	21.8
20.2			.080	1.48	1.50	84.	62.	4.0	501.	21.8
13.5			.060	1.10	1.10	85.	64.	3.5	500.	18.9
7.6			.070	1.29	1.30	89.	65.	4.0	496.	20.4
2.4	1003.0	887.062	.010	.18	.20	83.	69.	2.5	501.	7.7
40.6N	1010.0	887.062	.090	1.66	1.65	80.	67.	4.5	505.	23.2
28.5			.090	1.66	1.65	89.	69.	4.0	519.	23.4
20.2			.120	2.21	2.20	92.	69.	5.0	506.	26.8
13.5			.080	1.48	1.50	90.	70.	4.0	503.	21.9
7.6			.010	.18	.20	85.	70.	2.5	495.	7.7
2.4	1040.0	906.629	.010	.18	.20	86.	70.	2.5	501.	7.7
40.6E	1048.0	906.629	.100	1.84	1.85	83.	70.	4.5	505.	24.5
28.5			.100	1.84	1.85	91.	70.	4.5	521.	24.7
20.2			.090	1.66	1.65	95.	71.	4.0	491.	23.0
13.5			.080	1.48	1.50	95.	73.	4.5	495.	21.8
7.6			.080	1.48	1.50	99.	74.	4.0	497.	21.8
2.4	1118.0	927.743	.030	.55	.55	95.	75.	3.0	505.	13.4

O R S A T

CO2	4.3
O2	13.5
CO	.0
N	82.2

IMPINGER NO.	1	95.8
	2	32.8
	3	3.8
	4	.0
ABSORBED H2O		16.3

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.985	5-20-92
METER	0.9617	5-20-92
PITOT	0.84	9-10-92

LEAK CHECK

	RATE	IN.HG
INITIAL	0.015 CFM	5.0
FINAL	0.006 CFM	5.0

CONTROL BOX NO. 6 PROBE NO. 10-1 NOZZLE NO. NA

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA #9 Battery Stack
CLR-BS9-1 10-8-92

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG	29.35
B.	AVG. DELTA H (IN H2O)	1.34
C.	METER PRESSURE (IN. HG.)	29.45
D.	STATIC PRESSURE (IN. H2O)	-1.00
E.	STATIC PRESSURE (IN. HG.)	-.074
F.	STACK PRESSURE (IN. HG.) (A+E)	29.28
G.	STACK DIAMETER (IN.)	114.00
H.	STACK AREA (SQ. FT.)	70.88
	NOZZLE DIAMETER	.4350
I.	NOZZLE AREA (SQ. FT.)	.001032
J.	AVG. STACK TEMP (DEG. R.)	960.5
K.	AVG. METER TEMP (DEG. R.)	534.1
L.	CONDENSATE VOL. (ML)	132.4
M.	ABSORBED H2O (ML)	16.3
N.	TOTAL H2O (ML)	148.7
O.	METERED GAS (CF)	79.925
P.	GAS METER CORRECTION	.9617
Q.	CORRECTED METERED GAS (CF)	76.864
R.	H2O GAS VOLUME (CF) (0.00267N(K/C)	7.201
S.	TOTAL SAMPLED VOLUME (CF) (Q+R)	84.065
T.	PERCENT H2O (100R/S)	8.57
	THEORETICAL MAXIMUM	100.00
	PERCENT WATER USED	8.57
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K))	74.838

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100		MOISTURE CORRECTION (1-T/100)		MOLECULAR WEIGHT		WEIGHT PER MOLE
CO2	.043	X	.9143	X	44.0	=	1.73
CO	.000	X	.9143	X	28.0	=	.00
O2	.135	X	.9143	X	32.0	=	3.95
N2	.822	X	.9143	X	28.2	=	21.19
H2O		X	T/100= .0857	X	18.0	=	1.54
					MOLECULAR WEIGHT OF STACK GAS	=	28.42

W.	PITOT CORRECTION	.840
X.	AVERAGE CORRECTED VELOCITY (FPS) [85.49*W*SQRT{(J*DELTA P)/(V*F)}]	19.96
Y.	AVG. FLOW RATE (CFM) (X*H*60)	84901.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)	45665.
	STACK FLOW RATE (DRY)	41754.
AA.	SAMPLE TIME (SEC)	7200.
BB.	PERCENT ISOKINETIC (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	102.58

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA #9 Battery Stack
CLR-BS9-1 10-8-92

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.00930	.00000	.00850

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00000	.00000

PARTICULATE	.01780
ALL MATLS.	.01780

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00366	1.31090

Emission rates are based on EPA Method 5. DEB 11-2-92

KEYSTONE ENVIRONMENTAL RESOURCES
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA
#9 Battery Stack

DATE: 10-8-92
CHARGE #: ...150-605048
TEST #: CLR-BS9-2

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00637	2.20626

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2. STACK CONDITIONS

FLOW (ACFM)	83379.
(SCFM)	45511.
MOISTURE CONTENT (%)	11.23
STACK TEMPERATURE (F)	483.3

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	69.612
PERCENT ISOKINETIC	98.62

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA — #9 Battery Stack
CLR-BS9-2 — 10-8-92

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FT/SEC
40.6E	1504.0	928.410	.070	1.29	1.30	84.	79.	3.0	476.	19.9
28.5			.060	1.11	1.10	94.	79.	2.5	486.	18.6
20.2			.060	1.11	1.10	102.	82.	2.5	490.	18.6
13.5			.050	.92	.90	105.	84.	2.0	446.	16.6
7.6			.070	1.29	1.30	109.	87.	3.0	481.	20.0
2.4	1534.0	946.651	.060	1.11	1.10	111.	89.	2.5	492.	18.6
40.6N	1546.0	946.651	.070	1.29	1.30	93.	85.	3.0	490.	20.1
28.5			.070	1.29	1.30	105.	85.	3.0	499.	20.2
20.2			.060	1.11	1.10	109.	87.	2.5	471.	18.4
13.5			.050	.92	.92	109.	87.	2.5	469.	16.8
7.6			.060	1.11	1.10	111.	90.	2.5	480.	18.5
2.4	1616.0	964.695	.010	.18	.20	105.	91.	2.0	487.	7.6
40.6W	1625.0	964.695	.080	1.48	1.50	89.	89.	3.5	491.	21.5
28.5			.080	1.48	1.50	111.	91.	3.5	470.	21.3
20.2			.070	1.29	1.30	114.	93.	3.0	482.	20.0
13.5			.060	1.11	1.10	115.	94.	3.0	487.	18.6
7.6			.100	1.84	1.85	117.	94.	4.0	467.	23.7
2.4	1655.0	985.487	.080	1.48	1.50	118.	95.	3.5	481.	21.4
40.6S	1702.0	985.487	.080	1.48	1.50	99.	94.	3.5	494.	21.5
28.5			.090	1.66	1.65	110.	94.	3.5	497.	22.9
20.2			.080	1.48	1.50	113.	93.	3.0	502.	21.6
13.5			.060	1.11	1.10	114.	94.	3.5	485.	18.6
7.6			.090	1.66	1.65	115.	94.	3.5	485.	22.7
2.4	1732.0	1006.381	.090	1.66	1.65	115.	95.	4.0	491.	22.8

O R S A T	
CO2	13.8
O2	3.0
CO	.0
N	83.2

IMPINGER NO.	
1	140.4
2	28.7
3	3.2
4	.0
ABSORBED H2O	14.5

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.985	5-20-92
METER	0.9617	5-20-92
PITOT	0.84	9-10-92

LEAK CHECK

	RATE	IN.HG
INITIAL	0.018 CFM	5.0
FINAL	0.010 CFM	5.0

CONTROL BOX NO. 6 PROBE NO. 10-2 NOZZLE NO. NA

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA #9 Battery Stack
CLR-BS9-2 10-8-92

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG	29.25
B.	AVG. DELTA H (IN H2O)	1.27
C.	METER PRESSURE (IN. HG.)	29.34
D.	STATIC PRESSURE (IN. H2O)	-1.00
E.	STATIC PRESSURE (IN. HG.)	-.074
F.	STACK PRESSURE (IN. HG.) (A+E)	29.18
G.	STACK DIAMETER (IN.)	114.00
H.	STACK AREA (SQ. FT.)	70.88
	NOZZLE DIAMETER	.4350
I.	NOZZLE AREA (SQ. FT.)	.001032
J.	AVG. STACK TEMP (DEG. R.)	943.3
K.	AVG. METER TEMP (DEG. R.)	558.2
L.	CONDENSATE VOL. (ML)	172.3
M.	ABSORBED H2O (ML)	14.5
N.	TOTAL H2O (ML)	186.8
O.	METERED GAS (CF)	77.971
P.	GAS METER CORRECTION	.9617
Q.	CORRECTED METERED GAS (CF)	74.985
R.	H2O GAS VOLUME (CF) (0.00267N(K/C)	9.487
S.	TOTAL SAMPLED VOLUME (CF) (Q+R)	84.472
T.	PERCENT H2O (100R/S)	11.23
	THEORETICAL MAXIMUM	100.00
	PERCENT WATER USED	11.23
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K))	69.612

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.138	X	.8877	X	44.0	=	5.39
CO	.000	X	.8877	X	28.0	=	.00
O2	.030	X	.8877	X	32.0	=	.85
N2	.832	X	.8877	X	28.2	=	20.83
H2O		X	T/100= .1123	X	18.0	=	2.02
					MOLECULAR WEIGHT OF STACK GAS	=	29.09

W.	PITOT CORRECTION	.840
X.	AVERAGE CORRECTED VELOCITY (FPS) [85.49*W*SQRT{(J*DELTA P)/(V*F)}]	19.61
Y.	AVG. FLOW RATE (CFM) (X*H*60)	83379.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)	45511.
	STACK FLOW RATE (DRY)	40399.
AA.	SAMPLE TIME (SEC)	7200.
BB.	PERCENT ISOKINETIC (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	98.62

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA #9 Battery Stack
CLR-BS9-2 10-8-92

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.01430	.00000	.01450

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00000	.00000

PARTICULATE	.02880
ALL MATLS.	.02880

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00637	2.20626

Emission rates are based on EPA Method 5. DEB 11-2-92

KEYSTONE ENVIRONMENTAL RESOURCES
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA
#9 Battery Stack

DATE: 10-9-92
CHARGE #: ...150-605048
TEST #: CLR-9BS-3

1. EMISSION RESULTS

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00547	1.85808

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2. STACK CONDITIONS

FLOW (ACFM)	84887.
(SCFM)	44766.
MOISTURE CONTENT (%)	11.55
STACK TEMPERATURE (F)	514.7

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3. SAMPLING CONDITIONS

SAMPLE TIME (MIN.)	120.0
SCFD GAS SAMPLED	71.731
PERCENT ISOKINETIC	103.68

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA — #9 Battery Stack
CLR-9BS-3 — 10-9-92

FIELD DATA AND VELOCITY CALCULATIONS

POINT	TIME	METER READING (DRY) CF	DELTA P IN.H2O	ORIFICE DELTA H REQ	ORIFICE DELTA H ACT	METER TEMP DEG F IN	METER TEMP DEG F OUT	VACUUM IN.HG.	STACK TEMP DEG F	CORRECTED VELOCITY FFT/SEC
40.6S	1208.0	6.673	.090	1.66	1.65	71.	65.	3.0	523.	23.2
28.5			.080	1.48	1.50	79.	65.	3.0	529.	22.0
20.2			.070	1.29	1.30	89.	67.	3.0	535.	20.6
13.5			.060	1.11	1.10	91.	69.	2.5	515.	18.9
7.6			.060	1.11	1.10	94.	71.	2.5	509.	18.8
2.4	1238.0	25.064	.010	.18	.20	95.	73.	2.0	511.	7.7
40.6W	1244.0	25.064	.090	1.66	1.65	82.	73.	3.5	505.	23.0
28.5			.080	1.48	1.50	92.	73.	3.0	520.	21.9
20.2			.070	1.31	1.30	95.	74.	3.0	501.	20.3
13.5			.080	1.50	1.50	97.	75.	3.0	502.	21.7
7.6			.070	1.31	1.30	100.	77.	2.5	508.	20.3
2.4	1314.0	44.489	.020	.38	.40	95.	79.	2.0	511.	10.9
40.6N	1320.0	44.489	.100	1.88	1.90	90.	79.	3.5	541.	24.7
28.5			.100	1.88	1.90	96.	79.	3.5	510.	24.3
20.2			.090	1.69	1.70	101.	79.	3.5	502.	23.0
13.5			.090	1.69	1.70	101.	79.	3.5	502.	23.0
7.6			.060	1.13	1.10	101.	80.	2.5	504.	18.8
2.4	1350.0	64.332	.010	.19	.20	95.	80.	2.0	508.	7.7
40.6E	1358.0	64.332	.090	1.69	1.70	85.	79.	4.5	504.	23.0
28.5			.080	1.50	1.50	97.	79.	3.0	521.	21.9
20.2			.080	1.69	1.70	99.	79.	3.0	525.	21.9
13.5			.070	1.31	1.30	101.	80.	3.0	527.	20.5
7.6			.070	1.31	1.30	102.	81.	3.0	521.	20.5
2.4	1428.0	85.213	.070	1.31	1.30	104.	82.	3.0	518.	20.4

O R S A T

CO2	13.5
O2	3.0
CO	.0
N	83.5

IMPINGER NO.	1	149.8
	2	31.0
	3	3.1
	4	.0
ABSORBED H2O		14.7

CONTROL BOX CALIBRATIONS

	FACTOR	DATE
ORIFICE	1.985	5-20-92
METER	0.9617	5-20-92
PITOT	0.84	9-10-92

LEAK CHECK

	RATE	IN.HG
INITIAL	0.013 CFM	5.0
FINAL	0.007 CFM	5.0

CONTROL BOX NO. 6 PROBE NO. 10-1 NOZZLE NO. NA

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA #9 Battery Stack
CLR-9BS-3 10-9-92

STACK SAMPLING CALCULATIONS

A.	BAROMETRIC PRESSURE IN. HG	29.20
B.	AVG. DELTA H (IN H2O)	1.33
C.	METER PRESSURE (IN. HG.)	29.30
D.	STATIC PRESSURE (IN. H2O)	-1.00
E.	STATIC PRESSURE (IN. HG.)	-.074
F.	STACK PRESSURE (IN. HG.) (A+E)	29.13
G.	STACK DIAMETER (IN.)	114.00
H.	STACK AREA (SQ. FT.)	70.88
	NOZZLE DIAMETER	.4350
I.	NOZZLE AREA (SQ. FT.)	.001032
J.	AVG. STACK TEMP (DEG. R.)	974.7
K.	AVG. METER TEMP (DEG. R.)	544.8
L.	CONDENSATE VOL. (ML)	183.9
M.	ABSORBED H2O (ML)	14.7
N.	TOTAL H2O (ML)	198.6
O.	METERED GAS (CF)	78.540
P.	GAS METER CORRECTION	.9617
Q.	CORRECTED METERED GAS (CF)	75.532
R.	H2O GAS VOLUME (CF) (0.00267N(K/C)	9.860
S.	TOTAL SAMPLED VOLUME (CF) (Q+R)	85.392
T.	PERCENT H2O (100R/S)	11.55
	THEORETICAL MAXIMUM	100.00
	PERCENT WATER USED	11.55
U.	SCFD GAS SAMPLED (528*Q*C/(29.9*K))	71.731

V. MOLECULAR WEIGHT OF STACK GAS

COMPONENT	ORSAT-DRY VOL.PCT./100	X	MOISTURE CORRECTION (1-T/100)	X	MOLECULAR WEIGHT	=	WEIGHT PER MOLE
CO2	.135	X	.8845	X	44.0	=	5.25
CO	.000	X	.8845	X	28.0	=	.00
O2	.030	X	.8845	X	32.0	=	.85
N2	.835	X	.8845	X	28.2	=	20.83
H2O		X	T/100= .1155	X	18.0	=	2.08
					MOLECULAR WEIGHT OF STACK GAS	=	29.01

W.	PITOT CORRECTION	.840
X.	AVERAGE CORRECTED VELOCITY (FPS) [85.49*W*SQRT{(J*DELTA P)/(V*F)}]	19.96
Y.	AVG. FLOW RATE (CFM) (X*H*60)	84887.
Z.	STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)	44766.
	STACK FLOW RATE (DRY)	39597.
AA.	SAMPLE TIME (SEC)	7200.
BB.	PERCENT ISOKINETIC (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100))	103.68

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

USS CLAIRTON WORKS
Clairton, PA #9 Battery Stack
CLR-9BS-3 10-9-92

PARAMETER	CYCLONE WT. (G)	MATL.ON FILTER(G)	INSOL.MATL. IN PROBE(G)	SOL.MATL. IN PROBE(G)
PARTICULATE	.00000	.01890	.00000	.00660

PARAMETER	INSOL.MATL. IN IMP.(G)	SOLUBLE MATL. IN IMP.(G)
PARTICULATE	.00000	.00000

PARTICULATE	.02550
ALL MATLS.	.02550

PARAMETER	GR/SCFD	LB/HR
PARTICULATE	.00547	1.85808

Emission rates are based on EPA Method 5. DEB 11-2-92

COMPLIANCE DEMONSTRATION
#9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PA

APPENDIX F

ANALYTICAL RESULTS

KEYSTONE
ENVIRONMENTAL RESOURCES, INC

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

ANALYTICAL REPORTING FORM

CLIENT USS CLAIRTON
PLANT LOCATION
PROJECT NUMBER 605048-01
UNIT TESTED #9 BATTERY STACK

TEST DATE 10/8/92 & 10/9/92
DATE RECEIVED 10/8/92 & 10/9/92
DATE ANALYZED
ANALYTICAL METHOD EPA M5

Test Number	Component	Cyclone Weight Units ( )	Filter Weight Units (gm)	Insoluble Portion of Front Half Units ( )	0.22μ Filter Insoluble Portion of Back Half Units ( )	Soluble Portion of Back Half Units ( )	Soluble Portion of Front Half Units (gm)	Chloroform/ Ethyl Ether Extract Units ( )
CLR-9BS-1	PART.		0.0093				0.0085	
CLR-9BS-2	↓		0.0143				0.0145	
CLR-9BS-3			0.0189				0.0066	
CLR-9BS-BLK			—				0.0000	

Extraction Method
Solvent

Analyst's Signature
Date

Comments

AQE 3/92

COMPLIANCE DEMONSTRATION
#9 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PA

APPENDIX G

VISIBLE EMISSIONS DATA

KEYSTONE
ENVIRONMENTAL RESOURCES, INC

VISIBLE EMISSIONS OBSERVATIONS FORM

#9 STACK TESTING

OBSERVER: James E. McKay

DATE: 8 October, 1992

FACILITY: USX Clairton works

OBSERVATION: START TIME: 8:45

END TIME: 9:45

OBSERVATION POINT: Wabash Bath House Lot #9

SOURCE: Battery Draft Stack

DISTANCE: @ 625 ft

DIRECTION FROM: N-W of "

HEIGHT: @ 200 ft

WIND:

SPEED: 5 m.p.h

DIRECTION: → East

TEMPERATURE: 44°

SKY CONDITION: Hazy &

BACKGROUND: Sky & FOG

READING CONDITIONS: Poor-Fair

COLOR OF EMISSION: N/A

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: B FOREMAN: McCarkle

COMMENTS:

S. Start	0	0	0	0	0	:15	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0	Stopped	34	0	0	0	0
:30	5	0	0	0	0	:20	35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	0	0		37	0	0	0	0
	8	0	0	0	0		38	0	0	0	0
	9	0	0	0	0		39	0	0	0	0
:55	10	0	0	0	0	:25	40	0	0	0	0
	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
	13	0	0	0	0		43	0	0	0	0
	14	0	0	0	0	Start W	44	0	0	0	0
9:00	15	0	0	0	0	:30	45	0	0	0	0
	16	0	0	0	0		46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
	18	0	0	0	0		48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
:05	20	0	0	0	0	:35	50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0		52	0	0	0	0
	23	0	0	0	0		53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
:10	25	0	0	0	0	:40	55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
	27	0	0	0	0		57	0	0	0	0
	28	0	0	0	0		58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

Testing
#9 STACK

OBSERVER: James Embry

DATE: 8 October 1992

FACILITY: USX Clairton Works

OBSERVATION: START TIME: 9:45
END TIME: 10:45

OBSERVATION POINT: Wabash Ruth Homestead #9

SOURCE: Battery D Uptake Stack

DISTANCE: @ 625 Ft

DIRECTION FROM: N-W'ly

HEIGHT: @ 200 Ft

WIND:

SPEED: 6 m p h

DIRECTION: S.E

TEMPERATURE: 48°

SKY CONDITION: Haze

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: Black

TOTAL No. OF READINGS: 240

No. READINGS >= 20%: 0

No. READINGS >= 60%: 0

GREATEST OPACITY: 5%

CREW: B FOREMAN: McCorkle

COMMENTS:

	0	0	0	0	:15	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
:50	5	0	0	0	0	:20	35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	5	5		37	0	0	0	0
	8	5	5	5	5		38	0	0	0	0
	9	5	5	5	5		39	0	0	0	0
:55	10	5	5	5	5	:25	40	0	0	0	0
	11	5	5	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
	13	0	0	0	0		43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
Stop Coal	15	0	0	0	0	:30	45	0	0	0	0
	16	0	0	0	0		46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
	18	0	0	0	0		48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
:00	20	0	0	0	0	:35	50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
Start Coal	22	0	0	0	0		52	0	0	0	0
	23	0	0	0	0	5' Steam	53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
:10	25	0	0	0	0	:40	55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
	27	0	0	0	0		57	0	0	0	0
	28	0	0	0	0	5' Steam	58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

#9 Testing STACK

OBSERVER: James E. McKay

DATE: 8 October 1992

FACILITY: USX Clairton Works

OBSERVATION: START TIME: 10:45

END TIME: 11:45

OBSERVATION POINT: Wabash Bath House Lot #9

SOURCE: Battery Draft Stack

DISTANCE: @ 625 Ft

DIRECTION FROM: N-W of "

HEIGHT: @ 200 Ft

WIND:

SPEED: 8-m-p-h

DIRECTION: → S-E

TEMPERATURE: 54°

SKY CONDITION: CLEAR

BACKGROUND: SKY

READING CONDITIONS: Fair

COLOR OF EMISSION: N/A

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: B FOREMAN: McCarkle

COMMENTS:

	0	0	0	0	0	:15	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
:50	5	0	0	0	0	:20	35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	0	0		37	0	0	0	0
	8	0	0	0	0		38	0	0	0	0
	9	0	0	0	0		39	0	0	0	0
:55	10	0	0	0	0	:25	40	0	0	0	0
	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
	13	0	0	0	0		43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
11:00	15	0	0	0	0	:30	45	0	0	0	0
	16	0	0	0	0		46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
	18	0	0	0	0		48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
:05	20	0	0	0	0	:35	50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0		52	0	0	0	0
	23	0	0	0	0		53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
:10	25	0	0	0	0	:40	55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
	27	0	0	0	0		57	0	0	0	0
	28	0	0	0	0		58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

#9 Testing STACK

OBSERVER: James Emikey

DATE: 8 October 1992

FACILITY: USX Clanton Works

OBSERVATION: START TIME: 3:05

END TIME: 4:05

OBSERVATION POINT: Wabash Bath House Lot #9

SOURCE: Battery Draft Stack

DISTANCE: @ 625 Ft

DIRECTION FROM: N-W of

HEIGHT: @ 200 Ft

WIND:

SPEED: 14-M-P-H

DIRECTION: → S-E

TEMPERATURE: 71°

SKY CONDITION: Scattered Clds

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: Black

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 5%

CREW: B FOREMAN: McCorkle

COMMENTS:

E Start	0	0	0	0	0	:35	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
:10	5	0	0	0	0	:40	35	0	0	0	0
	6	0	0	0	0		36	0	0	0	0
	7	0	0	0	0		37	0	5	5	5
	8	0	0	0	0	Start N	38	5	5	5	5
	9	0	0	0	0		39	0	0	0	0
:15	10	0	0	0	0	:45	40	0	0	0	0
	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
	13	0	0	0	0		43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
:20	15	0	0	0	0	:50	45	0	0	0	0
	16	0	0	0	0		46	0	0	0	0
	17	0	0	0	0		47	0	0	0	0
	18	0	0	0	0		48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
:25	20	0	0	0	0	:55	50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0		52	0	0	0	0
	23	0	0	0	0		53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
:30	25	0	0	0	0	:00	55	0	0	0	0
	26	0	0	0	0		56	0	0	0	0
Stopped E	27	0	0	0	0		57	0	0	0	0
	28	0	0	0	0		58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

#9 TESTING STACK

OBSERVER: James E. McKay

DATE: 8 October 1992

FACILITY: US & Clanton Wells

OBSERVATION: START TIME: 4:05

END TIME: 5:05

OBSERVATION POINT: Wabash Bath House Lot #9

SOURCE: Battery Draft Stack N

DISTANCE: @ 625 Ft

DIRECTION FROM: N-wd

HEIGHT: @ 200 Ft

WIND:

SPEED: 10 m.p.h

DIRECTION: → S-E

TEMPERATURE: 71°

SKY CONDITION: CLEAR

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: Black

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 10%

CREW: [illegible] FOREMAN: McCaskle

COMMENTS:

	0	0	0	0	0	:35	30	0	0	0	0
	1	0	0	0	0		31	0	0	0	0
	2	0	0	0	0		32	0	0	0	0
	3	0	0	0	0		33	0	0	0	0
	4	0	0	0	0		34	0	0	0	0
:10	5	0	0	0	0	:40	35	0	0	0	0
	6	0	5	10	10		36	0	0	0	0
	7	10	10	5	5		37	0	0	0	0
	8	5	5	5	5	N Stopp	38	0	0	0	0
	9	5	5	5	5		39	0	0	0	0
:15	10	0	0	0	0	:45	40	0	0	0	0
	11	0	0	0	0		41	0	0	0	0
	12	0	0	0	0		42	0	0	0	0
	13	0	0	0	0		43	0	0	0	0
	14	0	0	0	0		44	0	0	0	0
:20	15	0	0	5	5	:50	45	0	0	0	0
	16	5	5	5	5		46	0	0	0	0
N Start	17	0	0	0	0	N Stopp	47	0	0	0	0
	18	0	0	0	0		48	0	0	0	0
	19	0	0	0	0		49	0	0	0	0
:25	20	0	0	0	0	:55	50	0	0	0	0
	21	0	0	0	0		51	0	0	0	0
	22	0	0	0	0		52	0	0	0	0
	23	0	0	0	0	S Start	53	0	0	0	0
	24	0	0	0	0		54	0	0	0	0
:30	25	0	0	0	0	:00	55	0	0	0	0
	26	0	0	5	5		56	0	0	0	0
	27	5	5	5	0		57	0	0	0	0
	28	0	0	0	0		58	0	0	0	0
	29	0	0	0	0		59	0	0	0	0

VISIBLE EMISSIONS OBSERVATIONS FORM

#9 Testing
STACK

OBSERVER: James E. McKay

DATE: 8 October 1992

FACILITY: ASC Clinton Works

OBSERVATION: START TIME: 5:05
END TIME: 5:35

OBSERVATION POINT: Walnut Bath House Lot #9

SOURCE: Boiler Duct Stack

DISTANCE: Ca 625 Ft
DIRECTION FROM: 21-486°
HEIGHT: Ca 200 Ft

WIND:

SPEED: 10-12 MPH
DIRECTION: → S-E
TEMPERATURE: 71°
SKY CONDITION: CLEAR
BACKGROUND: Sky

READING CONDITIONS: Rain
COLOR OF EMISSION: Black

TOTAL No. OF READINGS: 120
No. READINGS >= 20% 5
No. READINGS >= 60% 0
GREATEST OPACITY: 25%
CREW: D FOREMAN: McCorkle

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	10	15	15
11	15	20	20	20
12	25	20	15	10
13	10	10	5	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

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:10
:15
:20
:25
:30
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VISIBLE EMISSIONS OBSERVATIONS FORM

#9 Testing STACK

OBSERVER: James E. McKoy

DATE: 9 October, 1992

FACILITY: US Clairton Works

OBSERVATION: START TIME: 1200 N

END TIME: 1300

OBSERVATION POINT: Wabash Bath House Lot #9

SOURCE: Battery Draft Stack

DISTANCE: a 625 ft

DIRECTION FROM: N-W of "

HEIGHT: a 200 ft

WIND:

SPEED: 12-M-P-H

DIRECTION: → S-W

TEMPERATURE: 75°

SKY CONDITION: Cloudy

BACKGROUND: SKY

READING CONDITIONS: Fair

COLOR OF EMISSION: Black

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 5%

CREW: C FOREMAN: Hall

COMMENTS:

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

VISIBLE EMISSIONS OBSERVATIONS FORM

#9 TESTING STACK

OBSERVER: James E. McKay

DATE: 9 October, 1992

FACILITY: USE Clairton Works

OBSERVATION: START TIME: 1300

END TIME: 1400

OBSERVATION POINT: Wabash Bath House Lot #9

SOURCE: Battery Draft Stack

DISTANCE: a 6.25 Ft

DIRECTION FROM: N-W 87°

HEIGHT: a 200 Ft

WIND:

SPEED: 16-m-p-H

DIRECTION: → S-W

TEMPERATURE: 64°

SKY CONDITION: P. Cloudy

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: N/A

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: C FOREMAN: R. Hall

COMMENTS:

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

VISIBLE EMISSIONS OBSERVATIONS FORM

#9 Testing STACK

OBSERVER: James Smokey

DATE: 9 October 1992

FACILITY: USX Clairton Works

OBSERVATION: START TIME: 1400

END TIME: 1430

OBSERVATION POINT: Wabash Bath House Lot #9

SOURCE: Battery Draft Stack

DISTANCE: @ 625 Ft

DIRECTION FROM: N-WbF"

HEIGHT: @ 200 Ft

WIND:

SPEED: 16 M.P.H

DIRECTION: → S-W

TEMPERATURE: 64°

SKY CONDITION: P. Cloudy

BACKGROUND: Sky

READING CONDITIONS: Rain

COLOR OF EMISSION: N/A

TOTAL No. OF READINGS: 120

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: C FOREMAN: R. Nell

COMMENTS:

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

E Stopped