USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

Report on

COMPLIANCE DEMONSTRATION
NO. 14 BATTERY COMBUSTION STACK

SEPTEMBER 1994

U. S. Steel
Clairton Works
400 State Street
Clairton, PA 15025-1855

September 16, 1994

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

Deputy Director
Allegheny County Health Department
Department of Air Quality
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: #14 Battery Stack Compliance Demonstration
USS Clairton Works

I am enclosing with this letter the mass emission report on #14 Battery Combustion Stack. The compliance demonstration was conducted at USS Clairton Works, a division of USX Corporation, on August 16-17, 1994.

For questions regarding this report please call William C. Graeser at (412) 233-1467

Very truly yours,

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

GTW/BAC
Enclosure

cc: WGG w/o Enc.
GWL 9/20/94

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

Report on

COMPLIANCE DEMONSTRATION
NO. 14 BATTERY COMBUSTION STACK

SEPTEMBER 1994

Prepared By
Advanced Technology Systems, Inc.
3000 Tech Center Drive
Monroeville, Pennsylvania 15146 - 3055

Project No. IKM-0203

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY iii

1.0 INTRODUCTION 1

2.0 METHODOLOGIES 2

3.0 RESULTS 4

LIST OF TABLES

Table 1 Particulate Matter Emissions Data 6

APPENDICES

APPENDIX A TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

APPENDIX B PLANT OPERATIONAL DATA

APPENDIX C GRAVIMETRIC AND ANALYTICAL RESULTS, EMISSIONS CALCULATIONS

EXECUTIVE SUMMARY

On August 16 and 17, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, Pennsylvania, on the #14 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 Second Consent Decree (Civil Action Nos. 79-709, 91-329), Chapter V (Compliance Requirements - Clairton Works), Section F (Combustion Stacks), Specific Items 2 through 4.

The results of the testing showed an average particulate matter concentration and emission rate of 0.0087 grains per dry standard cubic foot (gr/dscf) and 2.53 pounds per hour (lb/hr), respectively. As promulgated by the Second Consent Decree, Chapter V, Section F.2.a, the allowable particulate matter concentration for #14 Battery Combustion Stack is 0.015 gr/dscf (a Lowest Achievable Emission Rate [LAER] standard). Thus, the particulate matter emissions from the stack are less than the allowable concentration.

During the test periods, the opacity of the exhaust gas was zero percent. As promulgated by the Second Consent Decree, Chapter V, Sections F.2.b and F.3, 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. Thus, the observed opacities were less than the allowable values.

1.0 INTRODUCTION

On August 16 and 17, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, Pennsylvania, on the #14 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 Second Consent Decree (Civil Action Nos. 79-709, 91-329), Chapter V (Compliance Requirements - Clairton Works), Section F (Combustion Stacks), Specific Items 2 through 4.

Testing was performed by Messrs. Richard Casselberry and Thomas Morgan of Advanced Technology Systems, Inc. (previously the Monroeville, Pennsylvania-based Air Emissions Measurement Group of Chester Environmental) and Mr. Lance Grumling of Environmental Technical Services under the direction of Mr. Bernie Clark of Chester Environmental. All test procedures were witnessed by Mr. Phil Lawrence of the Allegheny County Health Department - Department of Air Quality (DAQ).

The test program required two days to complete the field work activities due to a delay in the operation of the Battery #14. Since no ovens in Battery #14 were pushed or charged from approximately 0900 to 1230 on August 16, 1994, no emissions testing was completed during this time period. Once normal operations of the battery resumed (about 1230), emissions testing was resumed. Since there was an insufficient amount of daylight remaining after the completion of the second test run, the third test run was conducted on the following day, August 17, 1994.

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, Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual, and Appendix A of the Amended Installation Permit for USS Clairton Works Nos. 13, 14, and 15 Batteries. Three two-hour tests were executed during normal operating conditions. Greater than 50 dry standard cubic feet of sample gas was collected during each test run.

The process exhausts through a 120 inch diameter stack at stack platform level. 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 point was sampled for 5 minutes, thus bringing the total sampling time to 120 minutes.

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

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

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

As specified by EPA Method 5, each sample train was assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated such that isokinetic conditions are maintained. Clean up of the sampling train will include a

water rinse followed by an acetone rinse of both the front-half and back-half components of the sample train, as per PA DER particulate matter test methods. The water soluble and water insoluble portions of the front-half of the sampling train were determined as a total; that is, the water rinse was not filtered to determine soluble and insoluble portions. Front-half acetone and water rinses were evaporated to dryness, desiccated, and weighed to a constant weight. The water soluble and water insoluble portions of the back-half were determined separately in accordance with Section 139.12 of the PA DER Source Testing Manual. The back-half water rinses and first three impinger solutions were combined and then filtered under suction through a preweighed 0.22 micrometer membrane filter. The filter used to capture the insoluble material was dried, desiccated, and weighed to a constant weight. After filtration, the soluble back-half water was extracted with chloroform and ethyl ether. The extracts were evaporated to dryness, desiccated, and weighed to a constant weight. The filtrate, or remaining water from the extraction process, was evaporated to dryness, desiccated, and weighed to a constant weight. Following the gravimetric analyses for the filtrate residue, the residue was resolubilized and the solution submitted for sulfate analysis via ion chromatography. Back-half acetone rinses were evaporated to dryness, desiccated, and weighed to a constant weight. Sample train filters were desiccated for 24 hours, and particulate matter weight was determined gravimetrically. Rinse residue weights and filter weights were measured to the nearest 0.1 mg. One acetone blank and one deionized distilled water blank were prepared in the same manner as the test sample rinses. The blank residue weights were subtracted from the test sample residue weights. After blank correction, front-half water and acetone rinse residue weights, sample train filter weights, and back-half water insoluble filter weights were used to determine total particulate matter catch.

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

3.0 RESULTS

The test results have been summarized in Table 1. The results of the testing showed an average particulate matter concentration and emission rate of 0.0087 grains per dry standard cubic foot (gr/dscf) and 2.53 pounds per hour (lb/hr), respectively. As promulgated by the Second Consent Decree, Chapter V, Section F.2.a, the allowable particulate matter concentration for #14 Battery Combustion Stack is 0.015 gr/dscf (a Lowest Achievable Emission Rate [LAER] standard). Thus, the particulate matter emissions from the stack are less than the allowable concentration.

Table 1 also lists other pertinent stack and sampling parameters which include stack gas flow rate in units of actual cubic feet per minute (acfm), standard cubic feet per minute (scfm), and dry standard cubic feet per minute (dscfm), stack gas temperature (^{O}F), moisture content of the stack gas (percent by volume), gas volume sampled for each test in units of dry standard cubic feet (dscf), and the isokinetics value for each test. The 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. All isokinetic values were within the acceptable range of values. The gas volume sampled for each 120 minute test was greater than 50 dry standard cubic feet. Actual test sampling times have also been included in Table 1.

Copies of all field data sheets, including the visible emissions readings, can be found in Appendix A. As promulgated by the Second Consent Decree, Chapter V, Sections F.2.b and F.3, 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. During the test periods, the opacity of the exhaust gas was zero percent. Thus, the observed opacities were less than the allowable values.

All sampling equipment was calibrated and operated in accordance with EPA Stationary Source Sampling Methods 1 through 5. Copies of the pre-test calibration results, post-test calibration results, and the results of an audit conducted with a critical orifice provided by the Allegheny County Health Department DAQ can be found in Appendix A.

All testing was performed during periods of normal plant operation. Copies of the plant operational data can be found in Appendix B.

The gravimetric and analytical results (including the results of the sulfate analyses of the back-half filtrate from the sample trains) and the emissions calculations for each test can be found in Appendix C.

COMPLIANCE DEMONSTRATION
NO. 14 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

APPENDIX A

TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

TEST PROTOCOL
COMPLIANCE DEMONSTRATION
#14 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, Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual, and Appendix A of the Amended Installation Permit for USS Clairton Works Nos. 13, 14, and 15 Batteries. 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 120 inch diameter stack. A total of 24 traverse points (12 per diameter) will be sampled; the traverse points will be calculated in accordance with EPA Method 1. Sampling will be conducted through four equally spaced ports, with six traverse points sampled per port. Each point will be sampled for 5 minutes, thus bringing the total sampling time to 120 minutes.

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

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 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 a

water rinse followed by an acetone rinse of both the front-half and back-half components of the sample train, as per PA DER particulate matter test methods. The water soluble and water insoluble portions of the front-half of the sampling train will be determined as a total; that is, the water rinse will not be filtered to determine soluble and insoluble portions. Front-half acetone and water rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. The water soluble and water insoluble portions of the back-half will be determined separately in accordance with Section 139.12 of the PA DER Source Testing Manual. The back-half water rinses and first three impinger solutions will be combined and then filtered under suction through a preweighed 0.22 micrometer membrane filter. The filter used to capture the insoluble material will be dried, desiccated, and weighed to a constant weight. After filtration, the soluble back-half water will be extracted with chloroform and ethyl ether. The extracts will be evaporated to dryness, desiccated, and weighed to a constant weight. The filtrate, or remaining water from the extraction process, will be evaporated to dryness, desiccated, and weighed to a constant weight. Following the gravimetric analyses for the filtrate residue, the residue will be resolubilized and the solution submitted for sulfate analysis via ion chromatography. Back-half acetone rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. Sample train 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 and one deionized distilled water blank will be prepared in the same manner as the test sample rinses. The blank residue weights will be subtracted from the test sample residue weights. After blank correction, front-half water and acetone rinse residue weights, sample train filter weights, and back-half water insoluble filter weights will be used to determine total particulate matter catch.

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 - Department of Air Quality, field data sheets for the particulate matter sampling, and visible emissions determinations, emissions calculations sheets, and analytical results for each test.

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS | TEST DATE 08-16-94 (TUE) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 4
TEST UNIT #14 BATTERY STACK | TEST NO. USS-CLR-BS#14-1 | METER CORRECTION (Y) 1.0172 | PROBE NO. 7-2
PROJECT NO. IKM0203 | NOZZLE (SIZE,#) 0.490 | CALIBRATION DATE 08 20 94 | FILTER NO. 1919
TEST CREW RPC, TM | STATIC PRESSURE -1.1 | PITOT CORRECTION 0.84 | STACK DIA. 120"
BAROMETRIC PRESSURE 29.55 | PORT DIRECTION NORTH EAST | CONTROL BOX NO. SIX | PORT SIZE 40"

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
42.7	8:02	73-373	0.03	0.82	0.82	62	62	1.0	507	~250°	68° F	~250°	5 min./point
300			0.04	1.09	1.09	76	62	1.0	509		Ice bath down		
213			0.04	1.09	1.09	85	64	1.5	512				
142			0.04	1.09	1.09	90	66	1.5	496				
80			0.05	1.36	1.36	93	68	2.0	480				
42.6	09:32	97.168	0.03	0.82	0.82	94	69	1.0	481				
43.5	12:14	97.468	0.05	1.41	1.41	83	83	2.0	509				
300			0.04	1.13	1.13	94	82	1.5	520				
213			0.05	1.41	1.41	100	84	2.0	513				
142			0.03	1.03	0.85	102	85	1.0	505				
80			0.04	1.13	1.13	105	87	1.5	481				
2.6	12:44	115.200	0.03	0.85	0.85	106	87	1.0	473				
													Estimates:
													MW= 28.0
													%H2O= 14.5

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.011 cfm
After	5.0	<0.011 cfm

PITOT LEAK CHECK

	Positive	Negative
Before	OK/1.5 in	OK/1.5 in
After	OK/1.5 in	OK/1.5 in

OAS	1	2
CO2	4.5	4.5
O2	11.0	11.0
CO	0	0
N2	84.5	84.5

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 ml DI H2O	206.5	532.7	173.8
2.	100 ml DI H2O	584.2	556.2	28.0
3.	EMPTY	455.1	451.2	3.9
4.	SILICA GEL	679.5	657.5	22.0
5.				
6.				222.7
7.				
8.				

205.7 g

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS	TEST DATE 08-16-94 (TUE)	ORIFICE CORRECTION (ΔH@) 1.837	HOT/COLD BOX NO. 4
TEST UNIT # 14 BATTERY STACK	TEST NO. USS-CLR-BS#14-1	METER CORRECTION (Y) 1.972	PROBE NO. 7-2
PROJECT NO. IKM0203	NOZZLE (SIZE,#) 0.490	CALIBRATION DATE 06-00-94	FILTER NO. 139
TEST CREW RPC TM	STATIC PRESSURE -1.1	PITOT CORRECTION 0.84	STACK DIA. 120"
BAROMETRIC PRESSURE 29.55	PORT DIRECTION WEST, SOUTH	CONTROL BOX NO. SIX	PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	1248	115.200	0.05	1.41	1.41	95	90	2.0	501	~250°	<68° SICA DRUM	~250°	5 min./point
30.0			0.05	1.41	1.41	100	91	2.0	500				
21.3			0.05	1.41	1.41	117	92	2.0	501				
14.2			0.03	0.85	0.85	118	93	1.0	479				
8.0			0.03	0.85	0.85	116	94	1.0	486				
2.6	13:18	133.065	0.03	0.85	0.85	116	94	1.0	489				
42.7	13:21	133.065	0.05	1.41	1.41	104	94	2.0	504				
30.0			0.05	1.41	1.41	116	95	2.0	504				
21.3			0.04	1.13	1.13	119	95	1.5	498				
14.2			0.03	0.85	0.85	118	96	1.0	496				
8.0			0.03	0.85	0.85	118	96	1.0	475				
2.6	13:51	150.366	0.03	0.85	0.85	119	95	1.0	470				
Test	Δ=120	Δ=70.993	ΔP Ave =	(ΔH)Ave =		(T_met) Ave =			(T_stack) Ave =				Estimates:
Totals	min	dcf											MW= 28.0
			0.04	1.10			93.5°F		495.4				%H2O= 14.5

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2	4.5	4.5
O2	11.0	11.0
CO		
N2		

Impinger

Impinger No.	Contents	Final	Initial	Difference
1.	100 ml DI H2O			
2.	100 ml DI H2O			
3.	EMPTY			
4.	SILICA GEL			
5.				
6.				
7.				
8.				

ATS

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS	TEST DATE 08-16-94 TUE	ORIFICE CORRECTION (ΔH@) 1.837	HOT/COLD BOX NO. 5
TEST UNIT #14 BATTERY STACK	TEST NO. USS-CLR-BS#14-2	METER CORRECTION (Y) 1.0172	PROBE NO. 7-2
PROJECT NO. IKM0203	NOZZLE (SIZE,#) 0.490	CALIBRATION DATE 06-20-94	FILTER NO. # 1320
TEST CREW RPC, TM	STATIC PRESSURE -1.1	PITOT CORRECTION 0.84	STACK DIA. 120"
BAROMETRIC PRESSURE 29.55	PORT DIRECTION SOUTH WEST	CONTROL BOX NO. SIX	PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	14:18	150.727	0.05	1.44	1.44	88	88	2.5	513	~250°F	<68°F ICE BATH	~250°F	5 min./point
30.0			0.04	1.15	1.15	104	88	2.0	505				
21.3			0.03	0.86	0.86	110	88	1.5	506				
14.2			0.03	0.86	0.86	111	90	1.5	508				
8.0			0.03	0.86	0.86	114	91	1.5	490				
2.6	14:48	167.336	0.03	0.86	0.86	114	91	1.5	475				
42.7	14:51	167.336	0.05	1.44	1.44	100	93	2.5	506				
30.0			0.05	1.44	1.44	117	93	2.5	505				
21.3			0.04	1.15	1.15	117	93	2.0	500				
14.2			0.04	1.15	1.15	117	93	2.0	509				
8.0			0.03	0.86	0.86	117	93	1.5	479				
2.6	15:21	185.274	0.03	0.86	0.86	116	94	1.5	515				
													Estimates:
													MW= 28.0
													%H2O= 14.5

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before	6"/15sec	6"/15sec
After	6"/15sec	6"/15sec

GAS	1	2
CO2	4.5	4.5
O2	11.0	11.0
CO	0	0
N2	84.5	84.5

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL DI H2O	753.0	534.5	218.5
2.	100 mL DI H2O	525.1	484.5	40.6
3.	EMPTY	440.6	435.4	5.2
4.	Silica Gel	679.0	661.1	17.9
5.				
6.				282.2
7.				
8.				

264.3g

ATS

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS	TEST DATE 08-16-94 (TUE)	ORIFICE CORRECTION (ΔH@) 1.837	HOT/COLD BOX NO. 5
TEST UNIT #14 BATTERY STACK	TEST NO. USS-CLR-BS#14-94	METER CORRECTION (Y) 1.0172	PROBE NO. 7-2
PROJECT NO. IKM0203	NOZZLE (SIZE,#) 0.490	CALIBRATION DATE 06-20-94	FILTER NO. 1320
TEST CREW RPL, TM	STATIC PRESSURE -1.1	PITOT CORRECTION 0.84	STACK DIA. 120"
BAROMETRIC PRESSURE 29.55	PORT DIRECTION NORTH EAST	CONTROL BOX NO. SIX	PORT SIZE 40"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pilot 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
42.7	15:24	185.274	0.05	1.44	1.44	101	93	2.5	516	~250°F	68°F ICE 4 hours	~250°F	5 min./point
30.0			0.05	1.44	1.44	115	94	2.5	516				
21.3			0.04	1.15	1.15	118	94	2.0	518				
14.2			0.03	0.86	0.86	118	94	1.5	525				
8.0			0.03	0.86	0.86	116	94	1.5	501				
2.6	15:54	203.058	0.03	0.86	0.86	116	94	1.5	480				
42.7	15:57	203.058	0.05	1.44	1.44	104	93	2.5	510				
30.0			0.05	1.44	1.44	115	93	2.5	501				
21.3			0.05	1.44	1.44	116	93	2.5	500				
14.2			0.03	0.86	0.86	116	94	1.0	495				
8.0	~~16:27~~ 16:27 RPC		0.03	0.86	0.86	116	94	1.0	475				
2.6	16:27	221.085	0.03	0.86	0.86	115	94	1.0	478				
Test	Δ=120	Δ=70.358	ΔP/Δ=	ΔH/Δ=		(Tm)/Δ=			(Ts)/Δ=				Estimates:
Totals	min	dcf											MW= 28.0
			0.04	1.10			102.29°F		501.08	°F			%H2O= 14.5

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2	4.5	4.5
O2	11.0	11.0
CO	0	0
N2	84.5	84.5

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

ATS

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS | TEST DATE 08-17-94 (WED) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 5
TEST UNIT #14 BATTERY STACK | TEST NO. USS-CLR-BS14-3 | METER CORRECTION (Y) 1.0172 | PROBE NO. 7-2
PROJECT NO. IKM0203 | NOZZLE (SIZE,#) 0.490 | CALIBRATION DATE 06-20-94 | FILTER NO. 1325
TEST CREW RPC, TM | STATIC PRESSURE -1.1 | PITOT CORRECTION 0.84 | STACK DIA. 120"
BAROMETRIC PRESSURE 29.50 | PORT DIRECTION NORTH, EAST | CONTROL BOX NO. SIX | PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pilot 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
42.7	07:45	221.306	0.05	1.40	1.40	76	76	2.0	532	~250°F	68°F	~250°F	5 min./point
30.0			0.05	1.40	1.40	88	76	2.0	545		Ice Bath		
21.3			0.04	1.12	1.12	98	78	1.5	499				
14.2			0.03	0.84	0.84	99	79	1.0	503		1		
8.0			0.03	0.84	0.84	101	80	1.0	494				
2.6	08:15	239.015	0.03	084	084	106	81	1.0	486				
42.7	08:18	239.016	0.05	1.40	1.40	90	84	2.5	491				
30.0			0.04	1.12	1.12	107	85	2.0	511				
21.3			0.06	1.71	1.71	110	86	3.0	517				
14.2			0.05	1.43	1.43	112	87	2.5	522				
8.0			0.04	1.14	1.14	112	89	2.0	505				
2.6	08:48	257.821	0.03	0.86	0.86	113	89	1.0	461				
													Estimates:
													MW= 28.0
													%H2O= 14.5

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

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

GAS	1	2
CO2	4.5	4.5
O2	11.5	11.5
CO	0	0
N2	84.0	84.0

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI H2O	745.1	535.3	209.8
2.	100mL DI H2O	536.0	486.1	49.9
3.	EMPTY	443.7	436.0	7.4
4.	SILICA GEL	672.0	652.6	19.7
5.				
6.				286.5 g
7.				
8.				

267.1 g

ATS

STACK SAMPLING DATA SHEET

CLIENT USS - CLAIRTON WORKS	TEST DATE 08-17-94 (USA)	ORIFICE CORRECTION (ΔH@) 1.837	HOT/COLD BOX NO. 5
TEST UNIT #14 BATTERY STACK	TEST NO. USS-CLR-6514-3	METER CORRECTION (Y) 1.0172	PROBE NO. 7-2
PROJECT NO. IKM0203	NOZZLE (SIZE,#) 0.490	CALIBRATION DATE 06-20-94	FILTER NO. 1323
TEST CREW RPC, TM	STATIC PRESSURE -1.1	PITOT CORRECTION 0.84	STACK DIA. 120"
BAROMETRIC PRESSURE 29.50	PORT DIRECTION SOUTH, WEST	CONTROL BOX NO. SIX	PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	0851	257.821	0.05	1.43	1.43	103	89	2.0	506	~250°F	68°F	~250°F	5 min./point
30.0			0.03	0.86	0.86	105	89	1.0	491		ICE down		
21.3			0.05	1.43	1.43	111	90	2.0	487				
14.2			0.04	1.14	1.14	116	90	1.5	485				
8.0			0.04	1.14	1.14	116	90	1.5	480				
2.6	0921	275.821	0.03	0.86	0.86	117	90	1.5	469				
42.7	0924	275.821	0.05	1.43	1.43	115	90	2.5	510				
30.0			0.05	1.43	1.43	113	91	2.5	512				
21.3			0.05	1.43	1.43	113	91	2.5	506				
14.2			0.03	0.86	0.86	113	90	1.5	490				
8.0			0.03	0.86	0.86	113	90	1.5	479				
26	0954	294.054	0.03	0.86	0.86	112	90	1.5	500				
Test Totals	Δ=120 min	Δ=72.740 dcf	(ΔP)/n=	(ΔH)/n=		(Tm)/n=			(Ts)/n=				Estimates:
			0.04	1.16			96.44 °F		499.63 °F				MW= 28.0
													%H2O= 14.5

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2	4.5	4.5
O2	11.5	11.5
CO	0	0
N2	84.0	84.0

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

ATS

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 6 BP 28.95 In. Hg
DATE 06-20-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER	ORIFICE
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	COEFFICIENT Y	COEFFICIENT ΔH@
START			0.000	28.95				0.50	350.100		
HALF		81.0			98.0	89.0	93.5				
STOP	12.75		5.000						355.151		
CALCULATION	12.75	541.0	5.013	28.95			553.5	28.99	5.051	1.0140	1.873
START			0.000	28.95				1.00	355.600		
HALF		81.0			105.0	90.0	97.5				
STOP	8.95		5.000						360.700		
CALCULATION	8.95	541.0	5.013	28.95			557.5	29.02	5.100	1.0103	1.833
START			0.000	28.95				2.00	361.200		
HALF		81.0			110.0	92.0	101.0				
STOP	6.30		5.000						366.234		
CALCULATION	6.30	541.0	5.013	28.95			561.0	29.10	5.034	1.0273	1.805
AVERAGE										1.0172	1.837

POST TEST

BOX # 6 BP 28.95 in. Hg
DATE 08-22-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER	ORIFICE
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN Ti	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	COEFFICIENT Y	COEFFICIENT ΔH@
START			0.000	28.95				1.15	389.200		
HALF		72.0			95.0	80.0	87.5				
STOP	8.25		5.000						394.204		
CALCULATION	8.25	532.0	5.013	28.95			547.5	29.03	5.004	1.0279	1.763
START			0.000	28.95				1.15	394.600		
HALF		72.0			101.0	81.0	91.0				
STOP	8.33		5.000						399.630		
CALCULATION	8.33	532.0	5.013	28.95			551.0	29.03	5.030	1.0291	1.786
START			0.000	28.95				1.15	400.000		
HALF		72.0			107.0	84.0	95.5				
STOP	8.37		5.000						405.040		
CALCULATION	8.37	532.0	5.013	28.95			555.5	29.03	5.040	1.0355	1.789
AVERAGE										1.0308	1.780
DIFFERENCE										-1.3%	3.2%

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

0 to 3.0" H2O RANGE

MAGNEHELIC Δ P	MANOMETER
0.50	0.50
1.00	1.00
2.00	2.00
3.00	3.00

0 to 0.50" H2O RANGE
SLANT TUBE
PRIMARY STANDARD

0 to 5" H2O RANGE

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

PRE-TEST LEAK CHECK
DATE 06-20-94
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	394.400	394.619	0.219	10.000	0.000
WET	0.000	0.222	0.222		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

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

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

POST-TEST MAGNEHELIC CALIBRATION
BOX# 6
DATE 08-22-94
OPERATOR RPC

0 to 3.0" H2O RANGE

MAGNEHELIC

Δ P	MANOMETER
0.50	0.50
1.00	1.00
2.00	2.00
3.00	3.00

0 to 0.50" H2O RANGE
SLANT TUBE
PRIMARY STANDARD

0 to 5" H2O RANGE

MAGNEHELIC

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

POST-TEST LEAK CHECK
DATE 08-22-94
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	388.500	388.740	0.240	10.000	0.0000
WET	0.000	0.240	0.240		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

POST-TEST PYROMETER CHECK
DATE 08-22-94
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	300.0
8.31	400	400.0
10.57	500	501.0

QA ORIFICE AUDIT

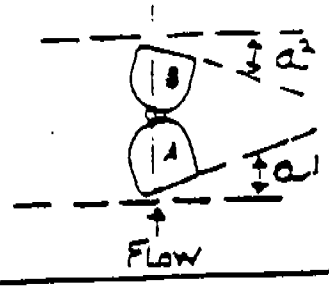
ORIFICE BAPC-3 DATE 06-09-94 B.P. 29.00
OPERATOR RPC BOX # 6

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

GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check

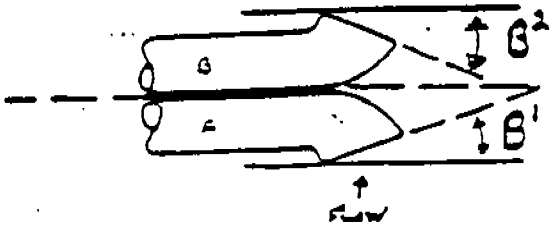
Probe #: 7-3
Date: 06-13-94
Initials: RPC

① 

a^1 = 1°
a^2 = 1°
a^1, a^2 = <10°

B^1 = 0°
B^2 = 1°
B^1, B^2 = <5°

F = 1.15"

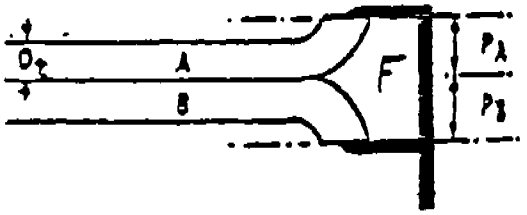
② 

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

V = 0.020
V = ≤0.03125" ($V = F \tan\theta$)

W = .30
W ≥ 0"

X = .820
X ≥ 0.750"
(3/4" using 1/2" nozzle)

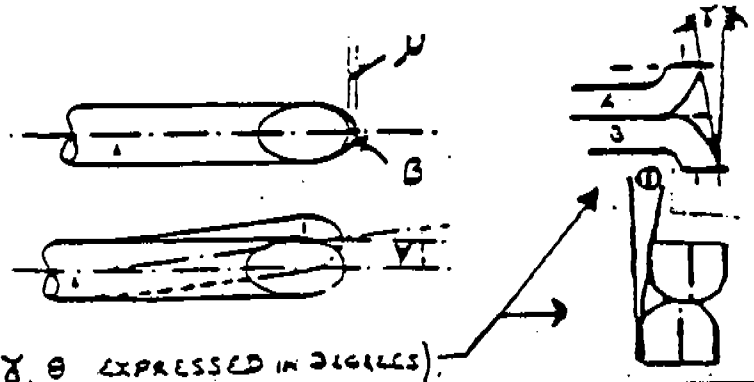
③ 

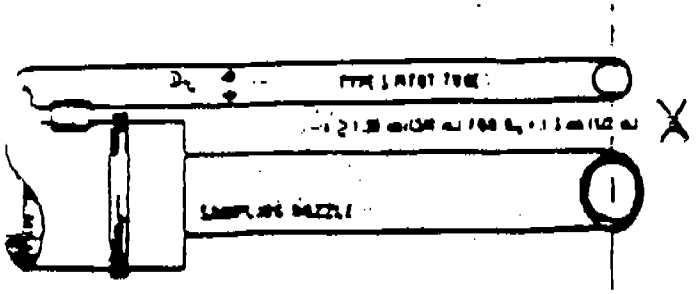
1.05 D_t ≤ <1.50 D_t
P_A ≠ P_B
2.10 D_t ≤ <3.00 D_t

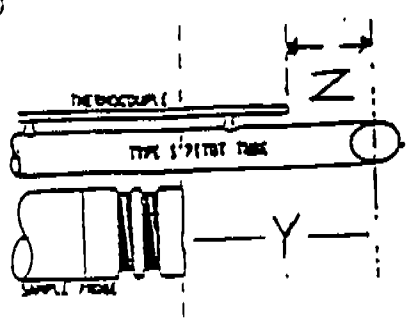
Y = 1.0"
Y ≥ 3.0"

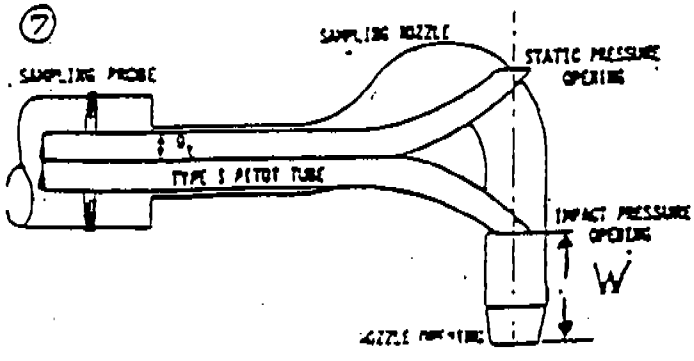
Z = 2.3"
Z > 2.0"

D_t = .385
D_t > .1875"

④ 

⑤ 

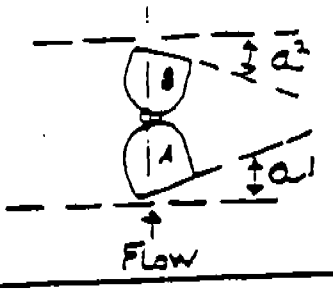
⑥ 

⑦ 

GEOMETRIC PITOT CALIBRATION

Caliper # XGF-59
Precheck
Post Check

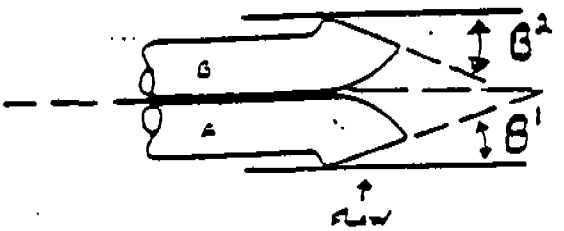
Probe #: 7-2
Date: 08-22-94
Initials: RPC

① 

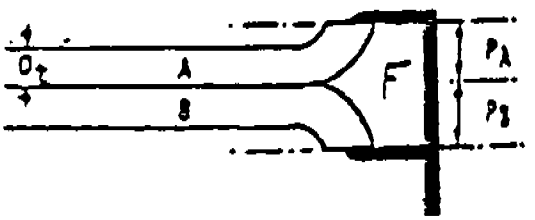
a¹ = 1°
a² = 1°
a¹, a² = <10°

B¹ = 0
B² = 1
B¹, B² = <5°

F = 1.190"

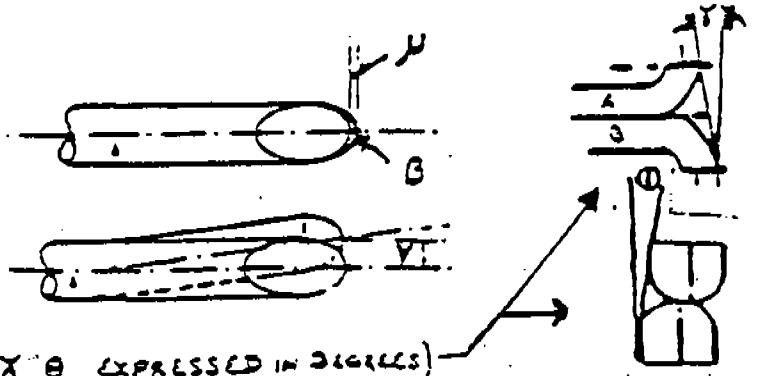
② 

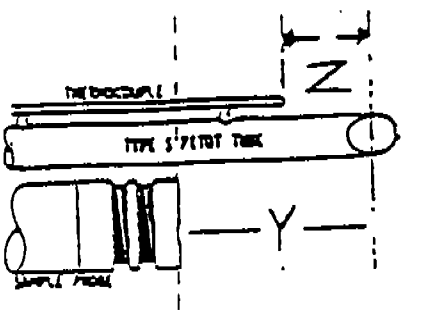
μ = 0 — μ = ≤ 0.1250" (μ = F TAN γ)
V = .02 — V = ≤0.03125" (V = F TAN θ)
W = .35 — W ≥ 0"
X = .828 — X ≥ 0.750" (3/4" using 1/2" nozzle)

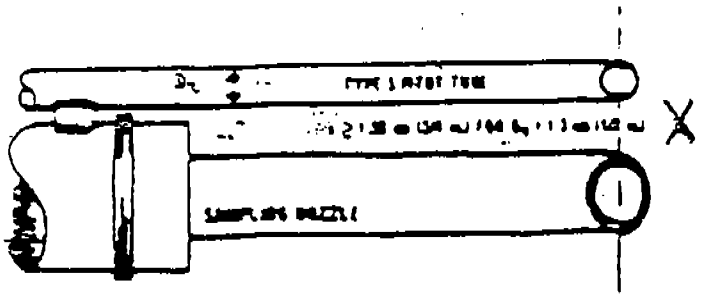
③ 

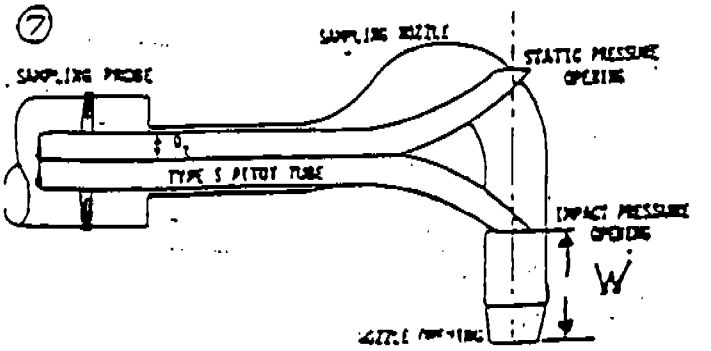
1.05 D_t ≤ <1.50 D_t
$P_A = P_B$
2.10 D_t ≤ <3.00 D_t

Y = 5.8 — Y ≥ 3.0"
Z = 2.4 — Z > 2.0"
D_t = .385 — D_t > .1875"

④ 

⑥ 

⑤ 

⑦ 

VISIBLE EMISSIONS OBSERVATIONS FORM

14 STACK TEST

OBSERVER: Lance Dunlap

DATE: 8-16-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 8:00

END TIME: 8:36

OBSERVATION POINT:

TRAILER AREA

SOURCE:

DISTANCE: 450'

DIRECTION FROM: SOUTH

HEIGHT: 200'

WIND:

SPEED: 3 MPH

DIRECTION: EAST

TEMPERATURE: 55°F

SKY CONDITION: HIGH LITE clouds

BACKGROUND: SKY

READING CONDITIONS: Good

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 144

No. READINGS >= 20%: —

No. READINGS >= 60%: —

GREATEST OPACITY: —

CREW: B FOREMAN: C Rauch

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM

14 STACK TEST

OBSERVER: [signature]

DATE: 8-16-99

FACILITY: USX. CLAIRTON

OBSERVATION: START TIME: 12:13

END TIME: 13:13

OBSERVATION POINT:

TRAILER AREA

SOURCE:

DISTANCE: 450'

DIRECTION FROM: SOUTH

HEIGHT: 200'

WIND:

SPEED: 9 MPH

DIRECTION: S-E

TEMPERATURE: 71°F

SKY CONDITION: CLOUDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: B FOREMAN: CROUCH

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM

14 STACK TEST

OBSERVER: [signature]

DATE: 8/16/94

FACILITY: USX - CLAINTON

OBSERVATION: START TIME: 13:13

END TIME: 14:13

OBSERVATION POINT:

TRAILER AREA

SOURCE:

DISTANCE: 450'

DIRECTION FROM: SOUTH

HEIGHT: 200'

WIND:

SPEED: 6 MPH

DIRECTION: S-E

TEMPERATURE: 73°F

SKY CONDITION: CLOUDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20%: 0

No. READINGS >= 60%: 0

GREATEST OPACITY: 0

CREW: B FOREMAN: CLOUGH

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
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	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

14 STACK TEST

OBSERVER: James Crumley

DATE: 8-16-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 14:13

END TIME: 15:13

OBSERVATION POINT: TRAILER AREA

SOURCE:

DISTANCE: 450'

DIRECTION FROM: SOUTH

HEIGHT: 200

WIND:

SPEED: 7

DIRECTION: S-E

TEMPERATURE: 73

SKY CONDITION: CLOUDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20%: 0

No. READINGS >= 60%: 0

GREATEST OPACITY: 0

CREW: B FOREMAN: CROUCH

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM

14 STACK TEST

OBSERVER: [signature]

DATE: 8-16-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 15:13

END TIME: 16:13

OBSERVATION POINT:

TRAILER AREA

SOURCE:

DISTANCE: 450'

DIRECTION FROM: SOUTH

HEIGHT: 200'

WIND:

SPEED: 7 MPH

DIRECTION: S-E

TEMPERATURE: 75°F

SKY CONDITION: CLOUDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20%: 0

No. READINGS >= 60%: 0

GREATEST OPACITY: 0

CREW: C FOREMAN: HALT

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM

14 STACK TEST

OBSERVER: James Dunlap

DATE: 8-16-94

FACILITY: USX - CLAIRTON

OBSERVATION: START TIME: 16:13
END TIME: 16:28

OBSERVATION POINT:
TRAILER AREA

SOURCE:

DISTANCE: 450'
DIRECTION FROM: South
HEIGHT: 200

WIND:

SPEED: 8 MPH
DIRECTION: S-E
TEMPERATURE: 76°F
SKY CONDITION: cloudy
BACKGROUND: SKY

READING CONDITIONS: FAIR
COLOR OF EMISSION: —

TOTAL No. OF READINGS: 60
No. READINGS >= 20% 0
No. READINGS >= 60% 0
GREATEST OPACITY: 0
CREW: C FOREMAN: HALT

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM

14 STACK TEST

OBSERVER: [signature]

DATE: 8-17-94

FACILITY: USX-CLAIRTON

OBSERVATION: START TIME: 7:45

END TIME: 8:45

OBSERVATION POINT:

TRAILER AREA

SOURCE:

DISTANCE: 450'

DIRECTION FROM: SOUTH

HEIGHT: 200

WIND:

SPEED: 5

DIRECTION: EAST

TEMPERATURE: 66°F

SKY CONDITION: OVER CAST

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: B FOREMAN: CROUCH

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM

14 STACK TEST

OBSERVER: [signature]

DATE: 8-17-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 8:45

END TIME: 9:45

OBSERVATION POINT:

Traiken Area

SOURCE:

DISTANCE: 450'

DIRECTION FROM: South

HEIGHT: 200

WIND:

SPEED: 5

DIRECTION: N.-E.

TEMPERATURE: 67°

SKY CONDITION: Overcast

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: 2 FOREMAN: Clouch

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM

14 STACK Test

OBSERVER: [signature]

DATE: 8-17-94

FACILITY: USX - Clairton

OBSERVATION: START TIME: 9:45

END TIME: 9:55

OBSERVATION POINT:
TRAILER AREA

SOURCE:

DISTANCE: 450'

DIRECTION FROM: South

HEIGHT: 200'

WIND:

SPEED: 7

DIRECTION: EAST

TEMPERATURE: 67 °F

SKY CONDITION: OVERCAST

BACKGROUND: SKY

READING CONDITIONS: Stair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 40

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: B FOREMAN: Crouch

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				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				

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

COMPLIANCE DEMONSTRATION
NO. 14 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

APPENDIX B

PLANT OPERATIONAL DATA

ATS

ADVANCED TECHNOLOGY SYSTEMS, INC.

CC-10295 REV. 1181
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. #5
12 Hrs. Beginning ~~12:00 P.M.~~ 11PM 8-15-94
Date 8-16-94

BATTERY NO. 13-A					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	5	44	6	02	
3	5	54	6	08	
5	6	12	6	15	
7	6	25	6	20	
9	7	05	7	33	
11	7	15	7	43	
13	7	25	7	53	
15	7	35	8	03	
17	7	45	8	13	
19	7	55	8	23	
21	8	05	8	33	
23	8	15	8	43	
25	8	25	8	53	
27	8	35	9	03	
29	8	45	9	13	
31	8	55	9	23	
2					
4					
6					
8					
10					
12					
14			11	02	
16			11	12	
18			11	22	
20	11	04	11	32	
22	11	14	11	42	
24	11	24	11	52	
26	11	34	12	02	
28	11	44	12	12	
30	11	54	12	22	
1					
2					22/25

BATTERY NO. 13-B					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	12	04	12	40	
3	12	14	12	50	
5	12	24	1	—	
7	12	42	1	10	
9	12	52	1	20	
11	1	02	1	30	
13	1	12	1	42	
15	1	22	1	52	
17	1	32	2	02	
19	1	44	2	12	
21	1	54	2	26	
23	2	04	2	38	
25	2	14	2	55	
27	2	28	3	06	
29	2	40	3	16	
31					
2	9	05	9	33	
4	9	15	9	43	
6	9	25	9	53	
8	9	35	10	03	
10	9	45	10	13	
12	9	55	10	23	
14	10	05	10	33	
16	10	35	10	38	
18	10	40	10	43	
20	10	45			
22	10	50			
24	10	55			
26					
28					
30					
1					
2					27/24

BATTERY NO. 14-A					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	2	57	3	26	
3	3	08	3	36	
5	3	18	3	47	
7	3	28	3	57	
9	3	38	4	09	
11	3	49	4	19	
13	3	59	4	29	
15	4	11	4	40	
17	4	21	4	50	
19	4	31	5	02	
21	4	42	5	12	
23	4	52	5	22	
25	5	04	5	32	
27	5	14	5	42	
29	5	24	5	52	
31	5	34	5	59	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					16/16

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
11-1	6	6	
1-2	5	5	
2-3	6	6	
3-4	5	5	
4-5	6	6	
5-6	5	5	
	33	33	

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

Total Ovens Pushed 65
Total Ovens Charged 65

Pusherman

Battery Foreman J. Shaw

CC-10295 REV. 1181
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 5

12 Hrs. Beginning ~~12 Noon~~ 11pm 8-15-94

Date 8/16/94

BATTERY NO. B-14					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11			11	02	
13			11	12	
15			11	22	
17	11	00	11	32	
19	11	10	11	38	
21	11	20	11	48	
23	11	30	12	02	
25	11	40	12	08	
27	11	50	12	18	
29	12	00	12	28	
31	XX	XX	XX	XX	
2	5	50	6	05	
4	6	00	6	10	
6	6	10	6	15	
8	7	05	7	07	
10	7	15	7	17	
12	7	25	7	27	
14	7	35	7	37	
16	7	45	7	47	
18	7	55	7	57	
20	8	05	8	07	
22	8	15	8	17	
24	8	25	8	27	
26	8	35	8	37	
28	8	45	8	47	
30	8	55	8	57	
1					27/25
2					

BATTERY NO. A-15					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	9	05	9	37	
3	9	15	9	47	
5	9	25	9	53	
7	9	35	10	03	
9	9	45	10	13	
11	9	55	10	23	
13	10	05	10	33	
15	10	15	10	43	
17	10	25	10	53	
19	3	00	7	22	
21	10	35			
23	10	45			
25	10	55			
27					
29					
31					
2	12	10	12	43	
4	12	20	12	53	
6	12	30	1	00	
8	12	45	1	12	
10	12	55	1	22	
12	1	05	1	35	
14	1	15	1	45	
16	1	25	1	55	
18	1	37	2	08	
20	1	47	2	18	
22	1	57	2	30	
24	2	10	2	44	
26	2	20	2	58	
28	2	32	3	03	
30	2	48	3	13	
1					28/25
2					

BATTERY NO. B-15					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	3	05	3	33	
3	3	15	3	35	
5	3	24	3	55	
7	3	35	4	06	
9	3	47	4	16	
11	3	57	4	26	
13	4	08	4	36	
15	4	18	4	46	
17	4	28	4	56	
19	4	38	5	12	
21	4	48	5	22	
23	4	58	5	42	
25	5	10	5	48	
27	5	20	5	58	
29	5	40	6	50	
31	XX	XX	XX	XX	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					15/15
2					

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
11-12	6	6	
12-1	6	6	
1-2	6	6	
2-3	4	5	
3-4	7	5	
4-5	6	6	
	35	34	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
5-6	4	5	
6-7	2	4	
7-8	6	7	
8-9	6	6	
10-11	6	3	
11-0	6	6	
	30	31	
	35	34	

Total Ovens Pushed 65

Total Ovens Charged 65

Pusherman

Battery Foreman

CC-10295 REV. 1181
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 5
12 Hrs. Beginning ~~12 P.M.~~ 11 AM
Date 8-16-94

BATTERY NO. 13-A					
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	22	3	40	
4	3	32	3	50	
6	3	42	4	00	
8	3	52	4	11	
10	4	02	4	21	
12	4	13	4	31	
14	4	23	4	41	
16	4	33	4	51	
18	4	43	5	00	
20	4	53	5	10	
22	5	02	5	22	
24	5	12	5	32	
26	5	24	5	42	
28	5	34	5	52	
30	5	44	6	02	
1					
2					15/15

BATTERY NO. 13-B					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	5	54	6	13	
3	6	04	6	23	
5	6	15	6	33	
7	6	25	6	43	
9	6	35	6	54	
11	6	45	7	04	
13	6	56	7	15	
15	7	06	7	27	
17	7	17	7	39	
19	7	29	7	50	
21	7	41	8	00	
23	7	52	8	12	
25	8	02	8	24	
27	8	14	8	36	
29	8	26	8	48	
31	X	X	X	X	X
2					
4					
6					
8					
10					
12					
14					
16					
18					
20			11	37	
22			11	47	
24			11	57	
26	11	39	12	08	
28	11	49	12	19	
30	11	59	12	30	
1					
2					18/21

BATTERY NO. 14-A					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	8	38	9	00	
3	8	50	9	24	
5	9	02	9	36	
7	9	14	9	48	
9	9	26	10	00	
11	9	38	10	12	
13	9	50			
15	10	02			
17	10	14			
18					
21					
23					
25					
27					
29					
31					
2	12	10	12	41	
4	12	21	12	52	
6	12	32	1	03	
8	12	43	1	14	
10	12	54	1	25	
12	1	05	1	36	
14	1	16	1	46	
16	1	27	1	57	
18	1	38	2	08	
20	1	48	2	12	
22	1	59	2	19	
24	2	10	2	24	
26	2	21	2	30	
28	3	02	3	10	
30	3	12	3	20	
1					
2					24/21

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	3	3	
1-2	5	5	
2-3	6	5	
3-4	2	5	
4-5	6	4	
5-6	6	6	
6-7	6	6	
7-8	5	5	
8-9	5	5	
9-10	5	4	
10-11	2	2	
	29	28	
	28	29	

Total Ovens Pushed 57
Total Ovens Charged 57

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. 5

12 Hrs. Beginning ~~12 PM~~ 11 AM

Date 8-16-94

BATTERY NO. 14 & 15					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	3	28	3	56	
3	3	38	4	06	
5	3	48	4	16	
7	3	58	4	26	
9	4	08	4	36	
11	4	18	4	46	
13	4	28	4	56	
15	4	38	5	06	
17	4	48	5	16	
19	4	58	5	26	
21	5	08	5	36	
23	5	19	5	48	
25	5	28	6	00	
27	5	38	6	09	
29	5	50	6	18	
31					
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					15/15

BATTERY NO. A-1					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
19					
21			11	38	
23			11	53	
25			12	07	
27	11	40	12	13	
29	11	55	12	23	
31	12	05	12	33	
2	6	02	6	32	
4	6	10	6	40	
6	6	20	6	50	
8	6	34	7	00	
10	6	42	7	10	
12	6	52	7	20	
14	7	02	7	30	
16	7	12	7	40	
18	7	22	7	50	
20	7	32	8	00	
22	7	42	8	10	
24	7	52	8	20	
26	8	02	8	30	
28	8	12	8	40	
30	8	22	9	00	
1					
2					16/21

BATTERY NO. B-1					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	8	32	9	08	
3	8	42	9	20	
5	9	02	9	38	
7	9	10	9	48	
9	9	23	9	54	
11	9	40	10	03	
13	9	50			
15	9	58			
17	10	05			
19					
21					
23					
25					
27					
29					
31					
2	12	15	12	43	
4	12	25	12	53	
6	12	34	1	03	
8	12	45	1	13	
10	12	55	1	23	
12	1	05	1	33	
14	1	15	1	43	
16	1	25	1	53	
18	1	35	2	02	
20	1	45	2	15	
22	1	55	3	06	
24	2	10	3	14	
26	2	20	3	26	
28	3	06	3	36	
30	3	16	3	46	
1					
2					24/21

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	2	2	
1-2	6	6	
2-3	6	6	
3-4	2	2	
4-5	6	6	
5-6	6	6	
	28	28	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	5	5	
7-8	6	6	
8-9	6	6	
9-10	5	5	
10-11	6	6	
11-12	1	1	
	29	29	

Total Ovens Pushed 57

Total Ovens Charged 57

Pusherman

Battery Foreman

CC-10285 REV. 1181
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. ~~5~~

12 Hrs. Beginning ~~12 midnight~~ 11pm on 8-16-94

Date 8-17-94

BATTERY NO. 13-A					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	12	06	12	28	
3	12	16	12	38	
5	12	26	12	54	
7	12	36	1	04	
9	12	52	1	14	
11	1	02	1	24	
13	1	12	1	34	
15	1	22	1	44	
17	1	32	1	54	
19	1	42	2	04	
21	1	52	2	14	
23	2	02	2	24	
25	2	12	2	34	
27	2	22	2	44	
29	2	32	2	53	
31	2	42	3	04	
2	8	55	9	01	
4	9	03	9	09	
6	9	11	9	17	
8	9	19	10	00	
10	10	02	10	13	
12	10	15	10	21	
14	10	23	10	44	
16	10	46	10	57	
18	10	59			
20					
22					
24					
26					
28					
30					
1					25/24
2					

BATTERY NO. 13-B					
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	51	3	14	
4	3	02	3	24	
6	3	12	3	32	
8	3	22	3	43	
10	3	30	3	53	
12	3	41	4	02	
14	3	51	4	13	
16	4	00	4	19	
18	4	11	4	29	
20	4	16	4	39	
22	4	27	4	49	
24	4	37	4	59	
26	4	47	5	06	
28	4	57	5	13	
30	5	08	5	20	
1					15/15
2					

BATTERY NO. 14-A					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13			11	00	
15			11	09	
17			11	15	
19	11	02	11	22	
21	11	11	11	32	
23	11	20	11	42	
25	11	30	11	52	
27	11	40	11	59	
29	11	50	12	08	
31	11	55	12	18	
2	5	18	5	25	
4	5	30	5	36	
6	5	45	5	50	
8	6	00	6	05	
10	7	05	7	13	
12	7	15	7	23	
14	7	25	7	33	
16	7	35	7	43	
18	7	45	7	53	
20	7	55	8	03	
22	8	05	8	13	
24	8	15	8	23	
26	8	25	8	33	
28	8	35	8	43	
30	8	45	8	53	
1					22/25
2					

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
1-1	7	8	
1-2	5	5	
1-3	6	6	
3-4	6	6	
5	6	6	
5-6	7	7	
	37	38	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
5	4	6	
6	1	1	
6-7	6	5	
7-8	6	6	
9-1	3	3	
1-2	5	5	
	25	26	
	37	32	

Total Ovens Pushed 62

Total Ovens Charged 64

Pusherman

Battery Foreman

0299 REV. 1181
.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 5

12 Hrs. Beginning ~~12 noon~~ 11 pm on B-16 5-4

Date 8/17/94

BATTERY NO. B-14

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	[illegible]	[illegible]	[illegible]	32	
3	[illegible]	35	[illegible]	37	
5	[illegible]	43	[illegible]	47	
7	[illegible]	53	[illegible]	57	
9	10	05	10	46	
11	10	19			
13	10	35			
15	[illegible]	48			
17					
19					
21					
23					
25					
27					
29					
31					
2	12	10	12	35	
4	12	21	12	43	
6	12	31	12	58	
8	12	39	1	08	
10	12	56	1	20	
12	1	06	1	29	
14	1	18	1	35	
16	1	27	1	45	
18	1	37	1	55	
20	1	47	2	08	
22	1	57	2	12	
24	2	06	2	20	
26	2	16	2	24	
28	2	26	2	32	
30	2	36	2	40	
1					
2					23/20

BATTERY NO. A-15

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	2	46	3	13	
3	2	55	3	19	
5	3	05	3	27	
7	3	15	3	37	
9	3	25	3	47	
11	3	35	3	56	
13	3	45	4	00	
15	3	54	4	06	
17	4	04	4	23	
19	12	46	4	33	PUSHED EARLY PURGE
21	4	21	4	43	
23	4	31	4	53	
25	4	41	5	03	
27	4	51	5	09	
29	5	01	5	14	
31	5	12	5	24	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					16/16

BATTERY NO. B-15

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13			11	05	
15			11	10	
17			11	17	
19	11	03	11	21	
21	11	15	11	27	
23	11	24	11	37	
25	11	35	11	47	
27	11	45	12	05	
29	12	00	12	21	
31					
2	5	22	7	00	
4	5	32	7	10	
6	5	47	7	20	
8	[illegible]	[illegible]	7	30	
10	[illegible]	[illegible]	7	40	
12	[illegible]	[illegible]	7	50	
14	[illegible]	[illegible]	8	01	
16	[illegible]	[illegible]	8	13	
18	[illegible]	[illegible]	8	23	
20	[illegible]	[illegible]	8	31	
22	[illegible]	[illegible]	8	43	
24	[illegible]	[illegible]	8	53	
26	[illegible]	[illegible]	9	02	
28	[illegible]	[illegible]	9	02	
30	[illegible]	[illegible]	9	27	
1					
2					2/24

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
11-12	5	7	
12-1	7	5	
1-2	6	6	
2-3	6	6	
3-4	6	6	
4-5	5	6	
	35	36	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
5-6	5	4	
6-7	—	—	
7-8	6	5	
8-9	6	7	
9-10	4	6	
10-11	4	1	
	25	24	
	35	36	
	60	60	

Total Ovens Pushed 60

Total Ovens Charged 60

Pusherman

Battery Foreman QC Baird

CC-10205 REV. 1161
03.001.0020
UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. #5
12 Hrs. Beginning ~~12 Mn~~ 11 PM
Date 8-17-94

BATTERY NO. 13-A's						BATTERY NO. 13-B's						BATTERY NO. 14-A's					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	8	02	8	22		1	12	38	1	12		1	4	43	5	11	
3	8	13	8	32		3	12	59	1	27		3	4	58	5	27	
5	8	24	8	42		5	1	14	1	42		5	5	13	5	42	
7	8	34	8	53		7	1	29	1	57		7	5	29	5	57	
9	8	44	9	03		9	1	44	2	13		9	5	44	6	12	
11	8	55	9	14		11	1	59	2	29		11	5	59	6	28	
13	9	05	9	25		13	2	15	3	08		13	6	14	6	39	
15	9	16	9	35		15	2	31	3	24		15	6	30	6	51	
17	9	27	9	46		17	2	47	3	38		17	6	41	7	02	
19	9	37	9	56		19	3	10	3	54		19	6	53	7	12	
21	9	48	10	06		21	3	26	4	10		21	7	04	7	23	
23	9	58	10	17		23	3	40	4	26		23	7	14	7	34	
25	10	08	10	28		25	3	56	4	41		25	7	25	7	44	
27	10	19				27	4	12	4	56		27	7	36	7	50	
29	10	30				29	4	28	5	00		29	7	46	8	00	
31	10	41				X		X		X		31	7	52	8	11	
2						2						2					
4						4						4					
6						6						6					
8						8						8					
10						10						10					
12						12						12					
14						14						14					
16						16						16					
18			11	23		18						18					
20	11	12	11	44		20						20					
22	11	25	11	57		22						22					
24	11	46	12	10		24						24					
26	11	59	12	23		26						26					
28	12	12	12	36		28						28					
30	12	25	12	57		30						30					
X		X		X	22/20	X		X		X	15/15	X		X		X	16/16
2						2						2					

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	4	3		5-6	4	5	
1-2	4	4		6-7	4	4	
2-3	4	4		7-8	6	6	
3-4	3	2		8-9	6	6	
4-5	4	4		9-10	6	6	
	4	4		10-11	4	3	
	23	21			30	30	

Total Ovens Pushed 53
Total Ovens Charged 51

Pusherman

Battery Foreman J. Baird

23 21

CC-10295 REV. 1181
03.601.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 5
12 Hrs. Beginning ~~12:00 P.M.~~ 11 AM
Date 8-17-94

BATTERY NO. B-14						BATTERY NO. A-15						BATTERY NO. 12-15					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1						1	10	50				1	4	52	5	36	
3						3						3	5	08	5	52	
5						5						5	5	24	6	06	
7						7						7	5	36	6	23	
9						9						9	5	54	6	36	
11			11	23		11						11	6	02	6	46	
13			11	23		13						13	6	28	6	56	
15			[illegible]	[illegible]		15						15	6	38	7	08	
17	7	05	11	56		17						17	6	48	7	18	
19	7	35	12	03		19						19	6	58	7	28	
21	[illegible]		[illegible]			21						21	7	10	7	38	
23	[illegible]		[illegible]			23						23	7	20	7	56	
25	[illegible]		[illegible]			25						25	7	36	8	08	
27	[illegible]					27						27	7	46	8	18	
29	[illegible]					29						29	7	58	8	28	
31	[illegible]		[illegible]			31						31	[illegible]		[illegible]		
2	8	10	8	36		2	12	54	1	37		2					
4	8	20	8	48		4	1	28	1	57		4					
6	8	30	9	00		6	[illegible]		[illegible]			6					
8	8	40	9	10		8	1	[illegible]	2	[illegible]		8					
10	8	50	9	22		10	[illegible]		2	47		10					
12	9	02	9	32		12	2	15	3	01		12					
14	9	12	9	42		14	2	30	3	16		14					
16	9	24	9	53		16	2	42	3	34		16					
18	9	34	10	03		18	3	03	3	48		18					
20	9	44	10	13		20	3	18	4	04		20					
22	9	55	10	28		22	3	36	4	20		22					
24	10	05	10	38		24	3	50	4	36		24					
26	10	15	10	48		26	4	06	4	50		26					
28	10	30				28	4	22	5	06		28					
30	10	40				30	4	38	5	22		30					
1						1						1					
2					22/23	2					16/15	2					15/15

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

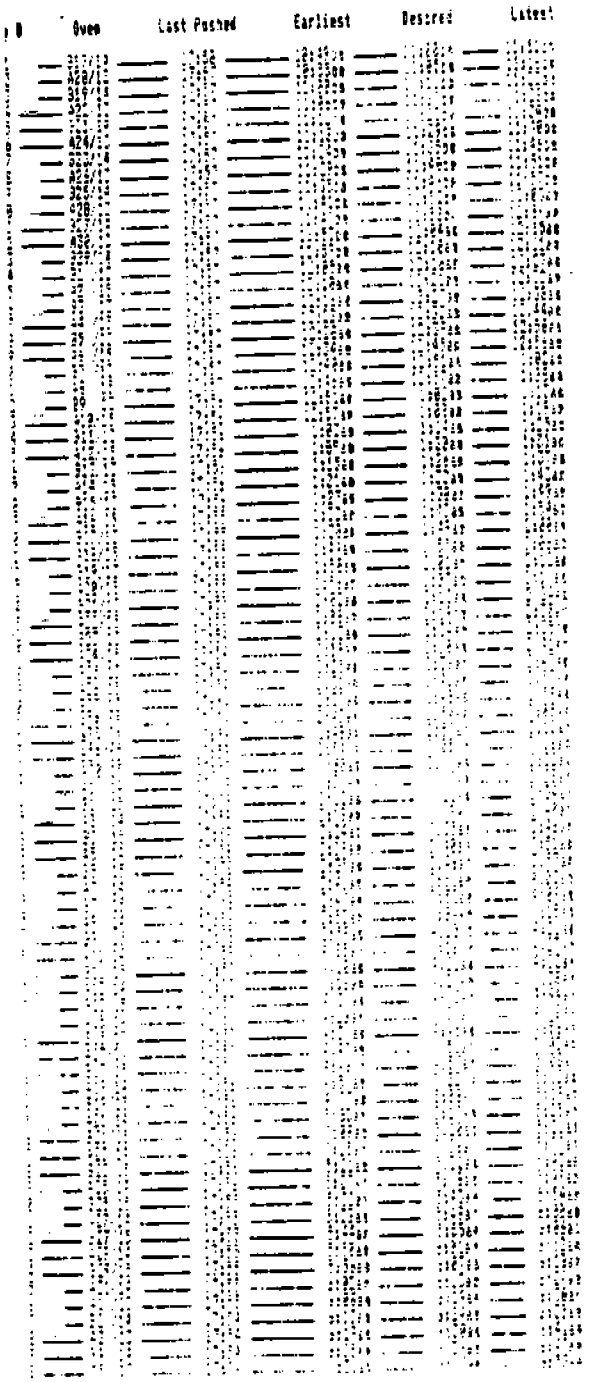
TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	4	4		6	4	4	
1-2	5	5		7	5	5	
2-3	4	4		8	5	5	
3-4	5	5		9	5	5	
4-5	4	4		10	6	6	
5-6	4	4		11	5	5	
	23	23			30	30	

Total Ovens Pushed 53
Total Ovens Charged 53

Pusherman
Battery Foreman J. C. Bard

PUSHING SCHEDULE

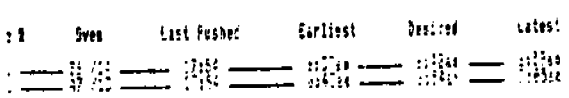
Tuesday, August 16, 1994 Turn 1
Batteries: 13-15_2



A19-15
WA28-15

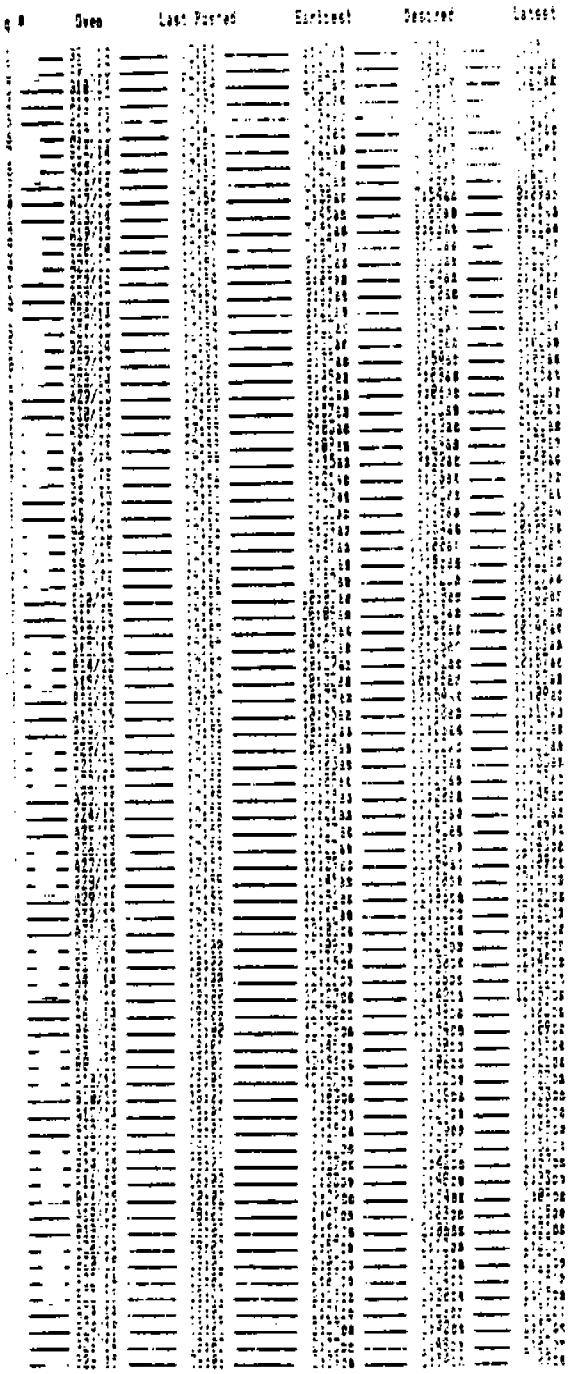
PUSHING SCHEDULE

Tuesday, August 16, 1994 Turn 1
Batteries: 13-15_2



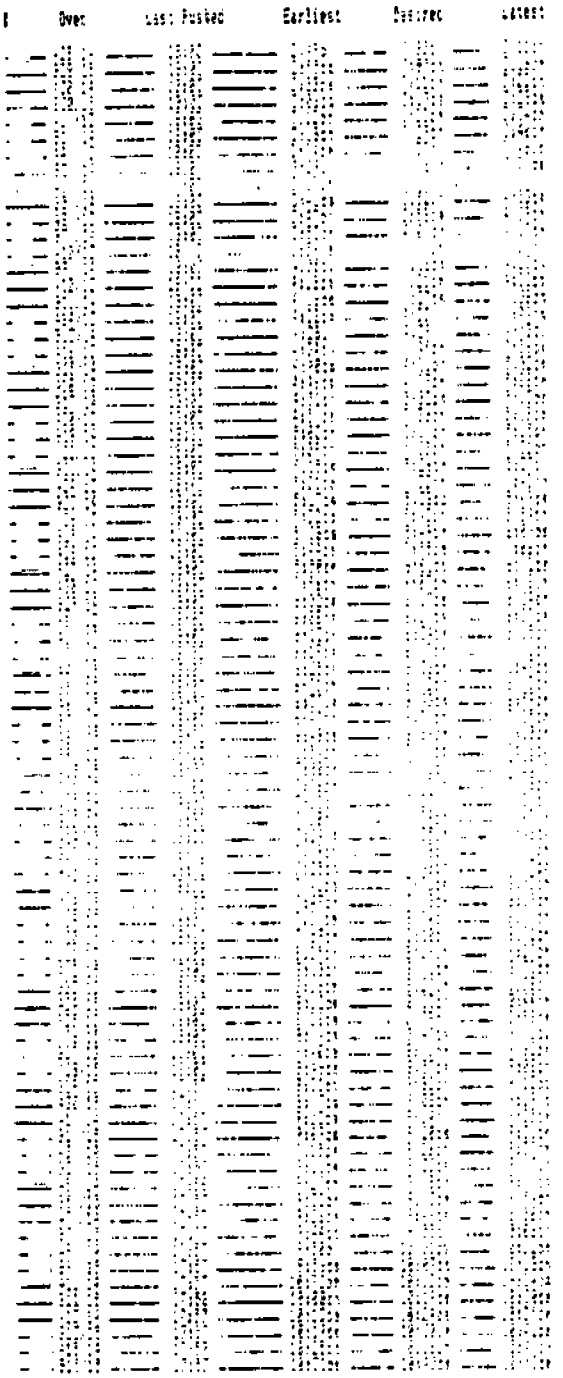
PUSHING SCHEDULE

Tuesday, August 16, 1994 Turn 3
Patterdex 13-03_3



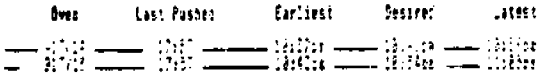
-A-19
15

Tuesday, August 16, 1994 Turn 3
Batteries: 13-15_2

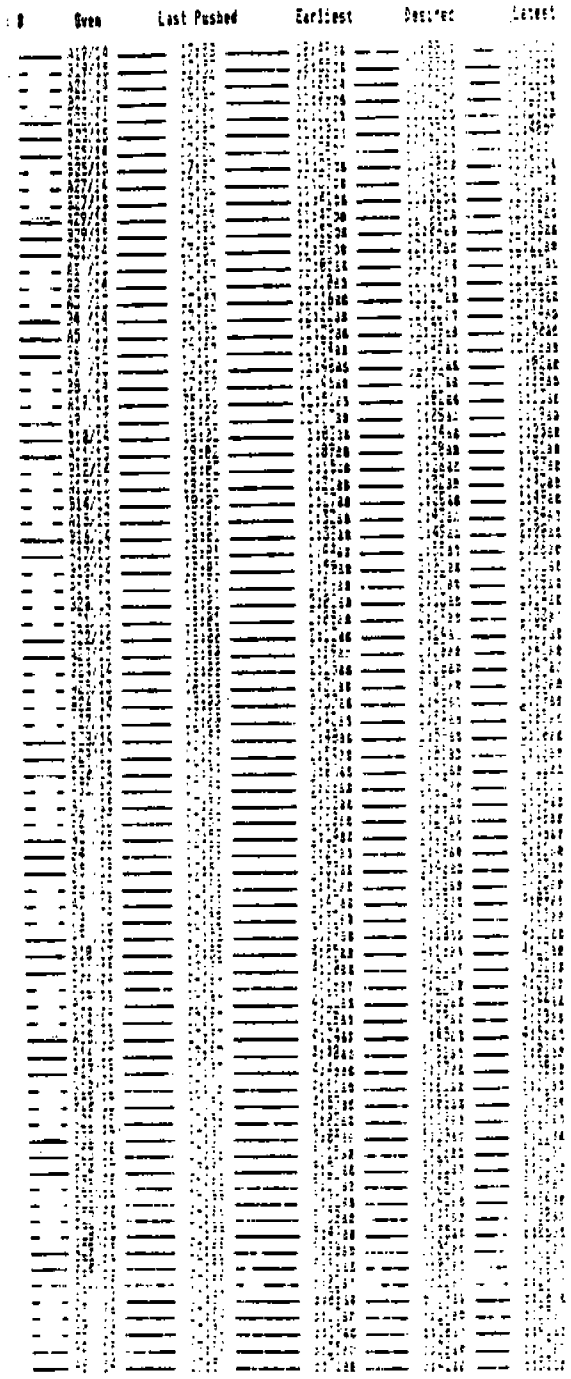


PUSHING SCHEDULE

Tuesday, August 16, 1994 Turn 3
Batteries: 13-15_2



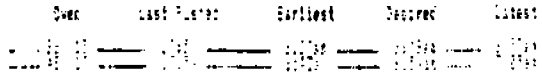
Wednesday, August 17, 1994 Turn 1
Batteries: 13-15_2



A 19-15
W B8-14

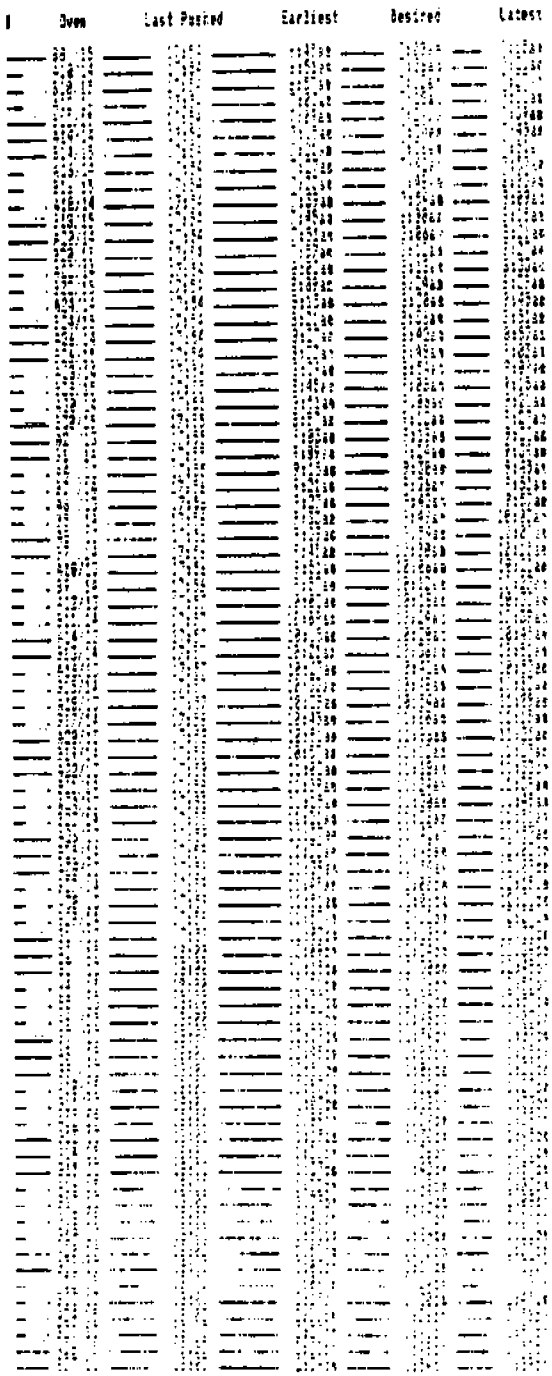
- A 19-15

Wednesday, August 17, 1994 Turn 1
Batteries: 13-15_2



PUSHING SCHEDULE

Wednesday, August 17, 1994 Turn 1
Batteries: 13-15_2



PUSHING SCHEDULE

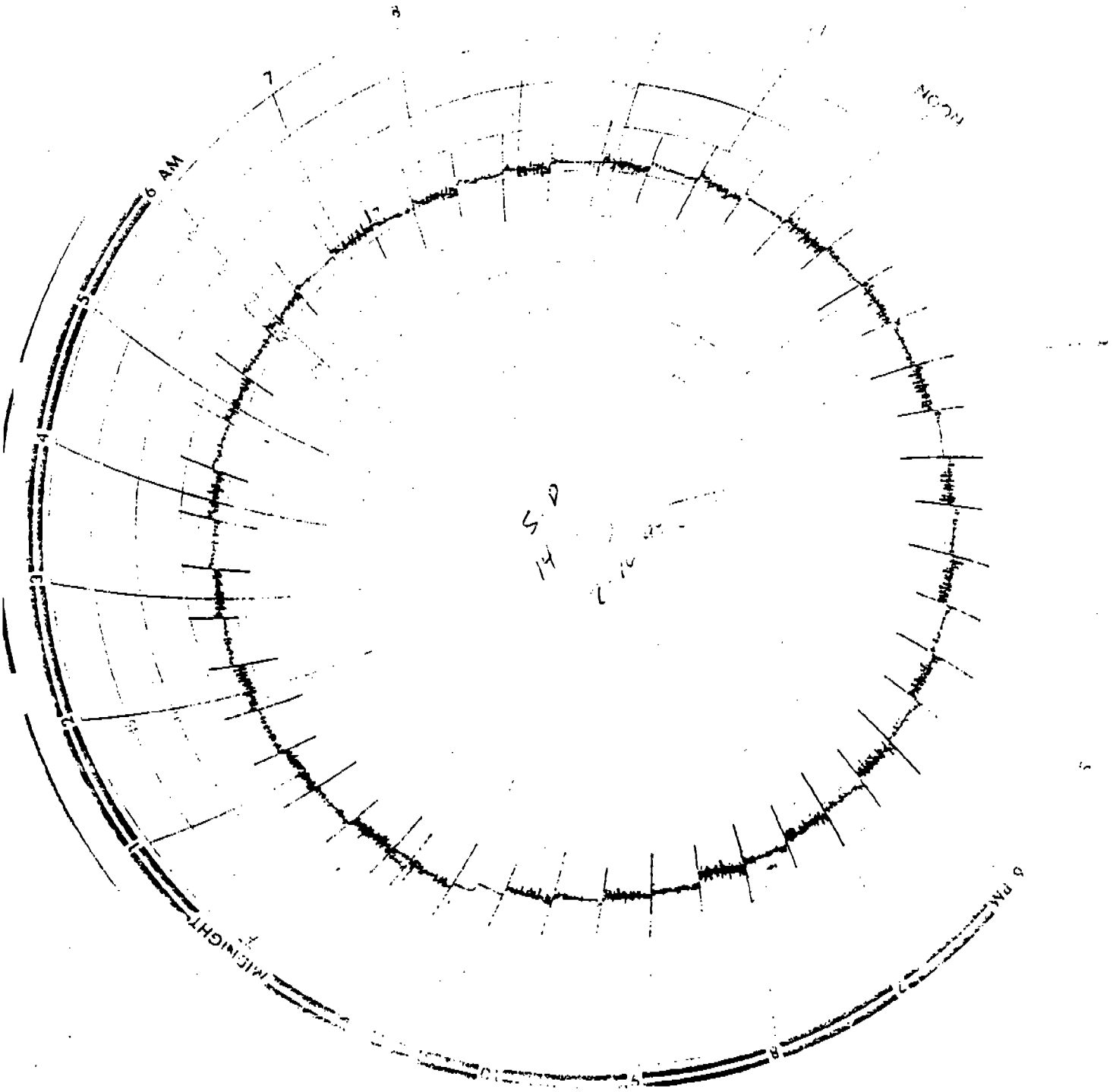
Wednesday, August 17, 1994 Turn 5
Batteries: 13-15_2

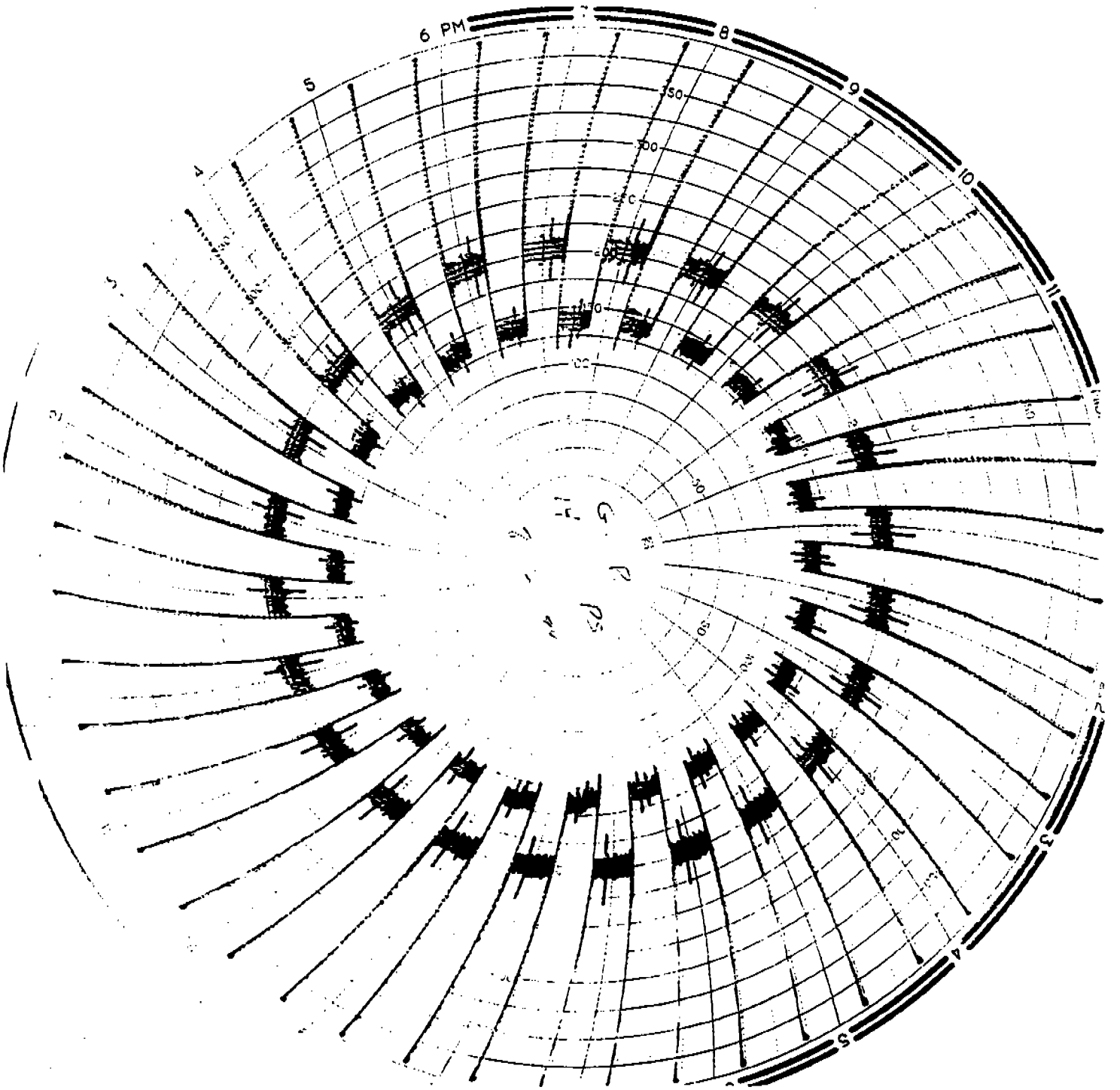
Seq #	Oven	Last Pushed	Earliest	Desired	Latest

PUSHING SCHEDULE

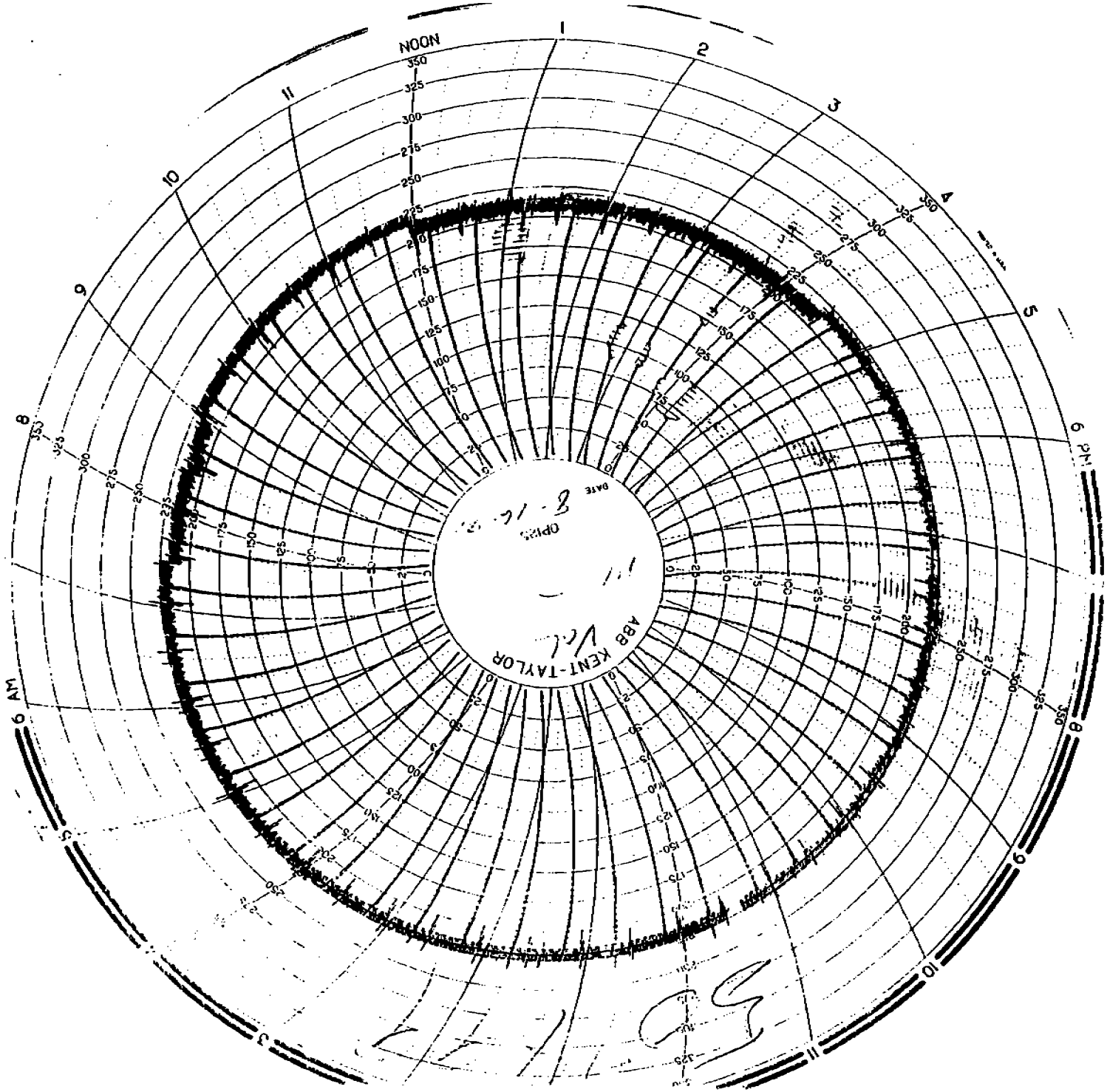
Wednesday, August 17, 1994 Turn 3
Batteries: 13-15_2

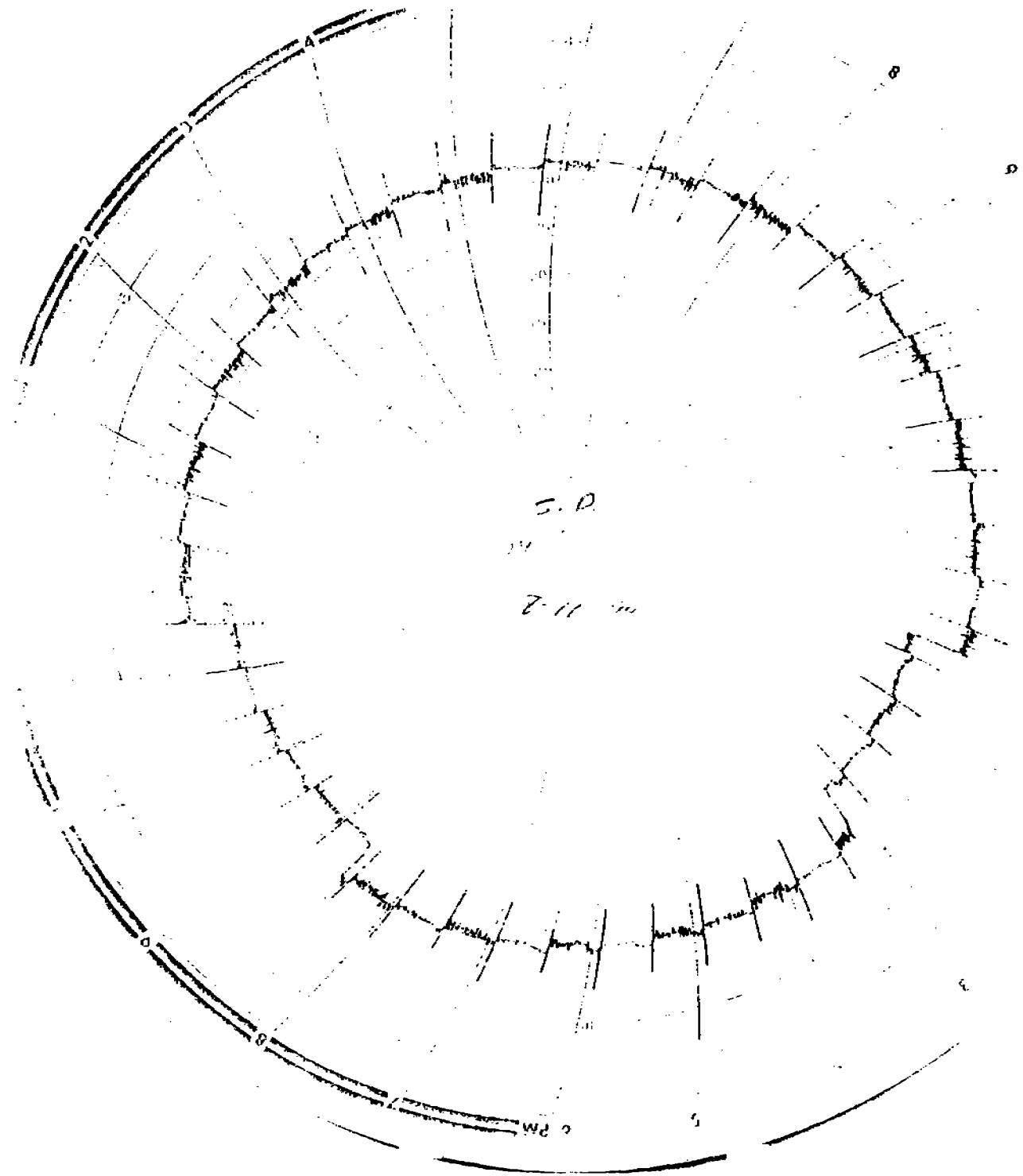
Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	25 /17	10:56	10:52pm	13:42pm	13:57pm
2	27 /15	10:56	10:43pm	10:54pm	11:05pm

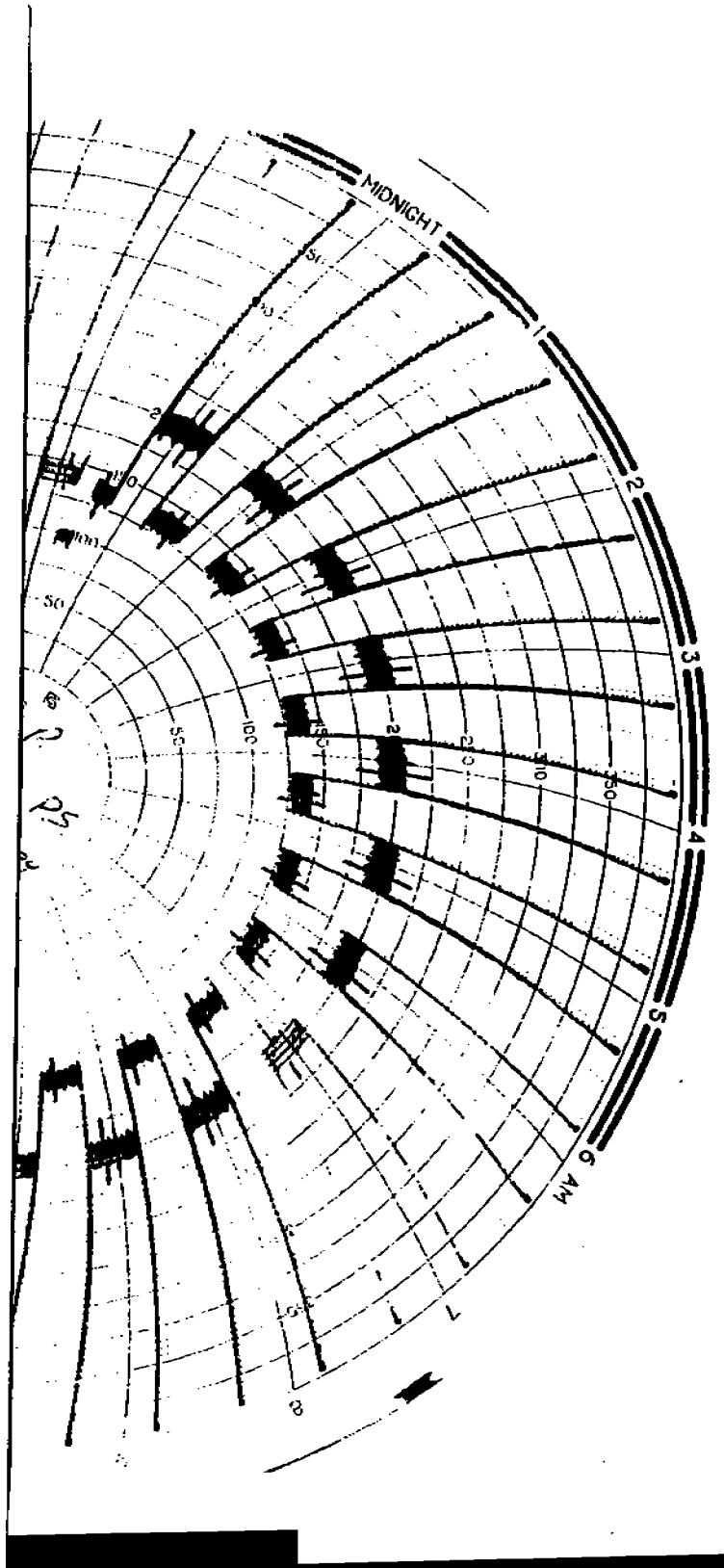

6 AM
NOON
6 PM
MIDNIGHT


6 PM
5
7
8
9
10
11
50
100
150
200
250

6 PM
7
10
11
MIDNIGHT
6 AM
5
4
NOON
350
300
250
200
150
100
50
30


NOON
1
2
3
4
5
6 PM
7
8
9
10
11
6 AM
ABB KENT-TAYLOR
DATE




MIDNIGHT
1
2
3
4
5
6 AM
7
8

6 PM
MIDNIGHT
6 AM
NOON
300
250
200
150
100
50

ABB KENT-TAYLOR
MIDNIGHT
DATE
8-17-94

ATS
AIR QUALITY ENGINEERING

ANALYTICAL REPORTING FORM

CLIENT USS - Clairton Steel
PLANT LOCATION Clairton, PA
PROJECT NUMBER IKM 0203
UNIT TESTED Battery Stack #14

TEST DATE 8/16 + 8/17/94
DATE RECEIVED 8/16 + 8/17/94
DATE ANALYZED 8/18/94
ANALYTICAL METHOD Gravimetric Method

Test Number	Filter ID Number	Component	Chloroform/ Ethyl Ether Extract Units (grams)	Filter Weight Units (grams)	Soluble Portion of Front Half H2O Rinse Units (grams)	Soluble Portion of Front Half Acetone Rinse Units (grams)	Soluble Portion of Back Half H2O Rinse Units (grams)	Soluble Portion of Back Half Acetone Rinse Units (grams)	0.22µm Filter Insoluble Portion of Back Half H2O Rinse Units (grams)
CLR-BS#14-1	1319	Particulate	0.0005	0.0128	0.0216	0.0049	0.0439	0.0046	0.0002
CLR-BS#14-2	1320	Particulate	0.0005	0.0133	0.0149	0.0035	0.0053	0.0019	0.0001
CLR-BS#14-3	1323	Particulate	0.0018	0.0137	0.0205	0.0097	0.0036	0.0056	0.0005
CLR-BS#14-BLK	1311	Particulate	0.0000	0.0001	0.0006	0.0004			

Analyst's Signature Patrick J. Stockton
Date 8/24/94

Comments

AQE 10/92

USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 1

#14 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

		Run 1	Run 2	Run 3	Average
Test Number		CLR-BS#14-1	CLR-BS#14-2	CLR-BS#14-3	
Test Date		08-16-94	08-16-94	08-17-94	
Mass Emissions Rate and Concentration					
Particulate Matter	(lb/hr)	2.64	2.11	2.83	**2.53**
	(gr/dscf)	0.0089	0.0074	0.0099	**0.0087**
Stack Conditions					
Flow Rate	(acfm)	73300	74000	73900	**73700**
	(scfm)	39900	40000	40000	**40000**
	(dscfm)	34500	33300	33500	**33800**
Temperature	(°F)	495	501	500	**499**
Moisture Content	(%)	13.6	16.7	16.3	**15.5**
Sampling Conditions					
Test times		0802	1418	0745	
		to 0832	to 1448	to 0815	
		1214	1451	0818	
		to 1244	to 1521	to 0848	
		1248	1524	0851	
		to 1318	to 1554	to 0921	
		1321	1557	0924	
		to 1351	to 1627	to 0954	
Sampling Time	(minutes)	120	120	120	
Sample Volume	(dscf)	68.265	66.554	69.432	
Isokinetics	(%)	99.0	99.8	103.7	

ATS
ADVANCED TECHNOLOGY SYSTEMS, INC.

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS
TEST SITE #14 BATTERY COMBUSTION STACK

TEST DATE: 08-16-94
TEST NUMBER: CLR-BS#14-1

A.	Barometric Pressure	29.55	in. Hg	
B.	Static Pressure	-1.1	in. H2O	
C.	Stack Pressure	29.47	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.10	in. H2O	
E.	Meter Pressure	29.63	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.04	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0172		
I.	Stack Diameter	120	in.	
J.	Stack Area	78.54	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	495	°F	
N.	Average Stack Temperature	955	°R	(460+M)
O.	Average Meter Temperature	93	°F	
P.	Average Meter Temperature	553	°R	(460+O)
Q.	Condensate Volume	205.7	mL	
R.	Absorbed H2O	22.0	mL	
S.	Total H2O	227.7	mL	(Q+R)
T.	Filter Weight	0.0128	g	
U.	Probe Weight	0.0265	g	
V.	Impinger Weight	0.0002	g	
W.	Total Weight	0.0395	g	(T+U+V)
X.	Metered Gas Volume	70.993	dcf	
Y.	Corrected Metered Gas Volume	72.214	dcf	(X*H)
Z.	H2O Gas Volume	11.380	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	83.595	cf	(Y+Z)
BB.	Percent H2O	13.6	%	(100*Z/AA)
CC.	Gas Volume Sampled	68.265	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0089	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.136		18	2.450
CO2	0.045	0.864	44	1.710
CO	0.000	0.864	28	0.000
O2	0.110	0.864	32	3.041
N2	0.845	0.864	28	20.439

Average Molecular Weight: 27.64 lb./lb. mol

FF.	Average Stack Velocity	15.6	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	73300	acfm	(60*FF*J)
HH.	Standard Flow Rate	39900	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	99.0	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	2.64	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS
TEST SITE #14 BATTERY COMBUSTION STACK

TEST DATE: 08-16-94
TEST NUMBER: CLR-BS#14-2

A.	Barometric Pressure	29.55	in. Hg	
B.	Static Pressure	-1.1	in. H2O	
C.	Stack Pressure	29.47	in. Hg	[A+(B/13.6)]
D.	Average ▵H	1.10	in. H2O	
E.	Meter Pressure	29.63	in. Hg	[A+(D/13.6)]
F.	Average ▵P	0.04	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0172		
I.	Stack Diameter	120	in.	
J.	Stack Area	78.54	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	501	°F	
N.	Average Stack Temperature	961	°R	(460+M)
O.	Average Meter Temperature	102	°F	
P.	Average Meter Temperature	562	°R	(460+O)
Q.	Condensate Volume	264.3	mL	
R.	Absorbed H2O	17.9	mL	
S.	Total H2O	282.2	mL	(Q+R)
T.	Filter Weight	0.0133	g	
U.	Probe Weight	0.0184	g	
V.	Impinger Weight	0.0001	g	
W.	Total Weight	0.0318	g	(T+U+V)
X.	Metered Gas Volume	70.358	dcf	
Y.	Corrected Metered Gas Volume	71.568	dcf	(X*H)
Z.	H2O Gas Volume	14.337	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	85.906	cf	(Y+Z)
BB.	Percent H2O	16.7	%	(100*Z/AA)
CC.	Gas Volume Sampled	66.554	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0074	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.167	[illegible]	18	3.004
CO2	0.045	0.833	44	1.650
CO	0.000	0.833	28	0.000
O2	0.110	0.833	32	2.933
N2	0.845	0.833	28	19.711

Average Molecular Weight: 27.30 lb./lb. mol

FF.	Average Stack Velocity	15.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	74000	acfm	(60*FF*J)
HH.	Standard Flow Rate	40000	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	99.8	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	2.11	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS — TEST DATE: 08-17-94

TEST SITE #14 BATTERY COMBUSTION STACK — TEST NUMBER: CLR-BS#14-3

A.	Barometric Pressure	29.50	in. Hg	
B.	Static Pressure	-1.1	in. H2O	
C.	Stack Pressure	29.42	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.16	in. H2O	
E.	Meter Pressure	29.59	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.04	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0172		
I.	Stack Diameter	120	in.	
J.	Stack Area	78.54	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	500	°F	
N.	Average Stack Temperature	960	°R	(460+M)
O.	Average Meter Temperature	96	°F	
P.	Average Meter Temperature	556	°R	(460+O)
Q.	Condensate Volume	267.1	mL	
R.	Absorbed H2O	19.4	mL	
S.	Total H2O	286.5	mL	(Q+R)
T.	Filter Weight	0.0137	g	
U.	Probe Weight	0.0302	g	
V.	Impinger Weight	0.0005	g	
W.	Total Weight	0.0444	g	(T+U+V)
X.	Metered Gas Volume	72.748	dcf	
Y.	Corrected Metered Gas Volume	73.999	dcf	(X*H)
Z.	H2O Gas Volume	14.429	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	88.428	cf	(Y+Z)
BB.	Percent H2O	16.3	%	(100*Z/AA)
CC.	Gas Volume Sampled	69.432	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0099	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.163		18	2.937
CO2	0.045	0.837	44	1.657
CO	0.000	0.837	28	0.000
O2	0.115	0.837	32	3.080
N2	0.840	0.837	28	19.682

Average Molecular Weight: 27.36 lb./lb. mol

FF.	Average Stack Velocity	15.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	73900	acfm	(60*FF*J)
HH.	Standard Flow Rate	40000	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	103.7	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	2.83	lb/hr	[DD*HH*(1-BB/100)*60/7000]

COMPLIANCE DEMONSTRATION
NO. 14 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

APPENDIX C

GRAVIMETRIC AND ANALYTICAL RESULTS, EMISSIONS CALCULATIONS

ATS

ADVANCED TECHNOLOGY SYSTEMS, INC.

RJ Lee *Group*, Inc.

350 Hochberg Road Monroeville, PA 15146
Phone (412) 325-1776 Fax (412) 733-1799

AMENDED LABORATORY REPORT

RECEIVED
SEP 12 1994

Advanced Technology Systems, Inc.
339 Haymaker Road, Suite 201
Monroeville, PA 15146
Attention: Patrick Stockton
(412) 856-0662 FAX (412) 825-9841

RJ Lee Group Job No.: INH408802
Samples Received: 29-Aug-94
Report Date: 31-Aug-94
Client Project: CLR
Purchase Order No.: 29197

Analysis: Sulfate Analysis
Method: Ion Chromatography

Sample Identification		Sulfate		
Client	RJ Lee Group	Volume	PPM *	Total mg
CLR-BS14-1	0135056	50	847	42.4
CLR-BS14-2	0135057	50	100	5
CLR-BS14-3	0135058	50	61.8	3.09
CLR-BS14-SO4-BLK	0135059	50	< 0.10	< 0.00010

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of thirty (30) days before discarding. A shipping and handling fee will be assessed for the return of any samples.

* Results reflect average of SO4 determination after sonicating samples.
Future samples will all be sonicated prior to analysis.

Analyst _____
Date 9/2/94

CHAIN OF CUSTODY RECORD

PLANT CODE: Ikm 0203 | PROJECT NAME: CLR | NUMBER OF CONTAINERS

SAMPLERS (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	WELL	STATION LOCATION	NUMBER OF CONTAINERS	SO_4 by Ion Chromatograph	CONDUCTIVITY	pH	REMARKS OR OBSERVATIONS
	8/16/94		✓			CLR-BS14-1	1	✓			Total Vol. 50ml
	8/16/94		✓			CLR-BS14-2	1	✓			Total Vol. 50ml
	8/17/94		✓			CLR-BS14-3	1	✓			Total Vol. 50ml
	8/17/94		✓			CLR-BS14-SO4-BLK.	1	✓			Total Vol. 50ml

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Catherine Stockton	8/25/94						
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Ice Chest Temp °C	Ice Chest # / Chain of Custody Tag #

*DISTRIBUTION: Original accompanies shipment; Copy to Coordinator Field Files.