

APPENDIX B

AP-42 Section 12.2
Reference
Report Sect. 4
Reference 149

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.

**Report on the
Particulate Emission Tests
Conducted for
Wheeling Pittsburgh Steel
At their
Monessen Plant Coke Ovens
Monessen, Pennsylvania
Purchase Order Number
292428**

Clean Air Engineering, Inc.

August 26, 1981

With added notations by

Wheeling-Pittsburgh Steel Corporation

Clean Air Engineering, Inc.

PUSHING
BY-PRODUCT COKE OVENS
RECORD OF VISIBLE
EMISSIONS OBSERVATIONS

APPENDIX A (CONTD)

COMPANY: W-P

PLANT: MONÉSSON

BATTERY: #1, #2

DATE: 8/4/81

Richard Thomas
OBSERVER SIGNATURE

REPRESENTING
COMPANY () DER (X)

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS <i>Time Quenched</i>
B-11	9:09*	○	○	○	9:13
C-11	9:27*	○	○	○	9:31
B-13	10:31*	○	○	○	10:35
C-13	10:44*	○	○	○	10:47
B-15	10:55*	○	○	○	10:58
C-15	11:09*	○	○	○	11:15
B-17	11:24*	○	○	○	11:20
C-17	11:40*	○	○	○	11:45
B-19	11:56*	○	○	○	12:00
C-19	12:09*	○	○	○	12:15
B-21	1:01*	○	○	○	1:08
C-21	1:15*	○	○	○	1:20
B-23	1:27*	○	○	○	1:31
C-23	1:40*	○	○	○	1:45
B-25	1:55*	○	○	○	2:02
C-25	2:01*	○	○	○	2:07

* Each Push lasts 30 to 45 seconds

Position of Observer:

Wheeling Pittsburgh

STEEL CORPORATION

Duvall Center
Wheeling, West Virginia 26003

September 15, 1981

U. S. Environmental Protection Agency
Region III
Curtis Building, Second Floor
6th and Walnut Streets
Philadelphia, PA 19106
Att: Director, Enforcement Division

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Air Quality Control
850 Kossman Building
100 Forbes Avenue
Pittsburgh, PA 15222

Re: MONESSEN COKE PLANT
PUSHING EMISSION CONTROLS
DEMONSTRATION OF COMPLIANCE

Gentlemen:

Tests and observations were recently conducted at our Monessen Coke Plant to demonstrate compliance with applicable regulations for pushing emission controls. The details and results of these efforts are contained in the two attached appendices.

Appendix A reports a series of visible emission observations made by Mr. Richard Thomas, of the Pennsylvania Department of Environmental Resources. These observations were made during his evaluation of emissions during the pushing of coke from the oven and into the quench car, and also from the car during the transport of the coke to the quench tower. No visible emissions were reported from the thirty-nine (39) "pushes" observed.

The report by our consultant, Clean Air Engineering, on the testing of the baghouse gas cleaning portion of the pushing emission control system is attached as Appendix B. Visible emissions from the baghouse stack are reported as zero percent opacity throughout the test.

In order to demonstrate compliance with the process weight limitation of the Pennsylvania Air Emission Regulation (123.13b), additional transformations of the data were necessary. We have added these computations and results to the report at the appropriate places. All such additions have been carefully designated with two asterisks (**) to differentiate them from the material supplied by our consultants. These computations indicate that, under the conditions of the tests, allowable emissions ranged from about 3.4 to 3.7 pounds per hour while actual emissions were only 0.6 to 1.6 pounds per hour.

RECEIVED
SEP 18 1981
WATER
ENFORCEMENT BRANCH

Page 2 - 9/15/81
MONESSEN COKE PLANT
PUSHING EMISSION CONTROLS
DEMONSTRATION OF COMPLIANCE

We believe that this information for the pushing emission control system at our Monessen Coke Plant amply demonstrates compliance. If you have any questions or need further information, please let us know.

Very truly yours,

WHEELING-PITTSBURGH STEEL CORPORATION



W. R. Samples
Manager
Environmental Control

WRS/ng
Attachment

cc: Mr. Denis M. Zielinski - USEPA-III (w/attach)
Mr. Richard Thomas - Pa.DER-Greensburg (w/attach)

SOTDAT/STEEL LIBRARY SYSTEM

Report Title: -

Plant and Location: Wheeling - Pitt Monessen, PA

SCC: 30300303

Testing Date(s): 8/3-5/81

By Whom: CAE

Stack Test Review Attached: No

Reviewed By:

Problems Seen by Reviewer:

Confidentiality Status: ☐

If status is confidential, list confidential pages or sections:

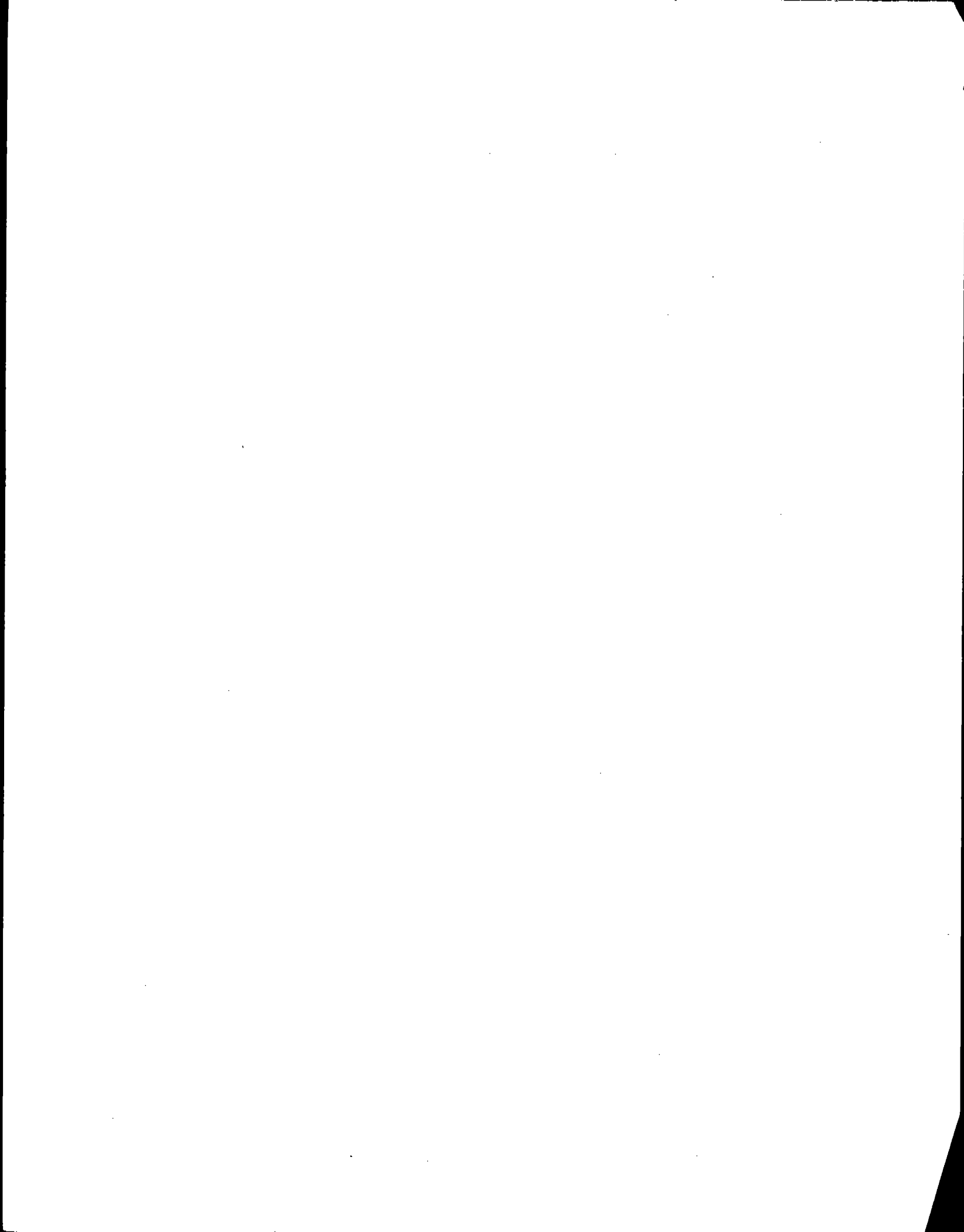
Source of Determination of the Confidentiality Status:

Report Encoded By:

Date Encoded:

Form Numbers:

Comments:

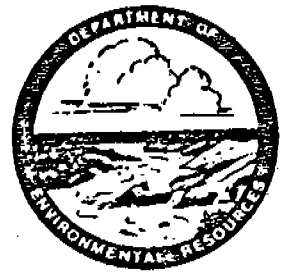


APPENDIX A



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

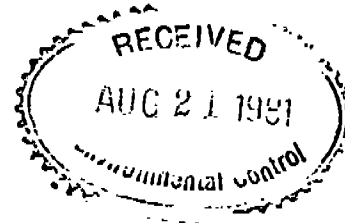
ENVIRONMENTAL PROTECTION
Bureau of Air Quality Control
Armbrust Professional Center
R. D. #2, Box 603-C
Greensburg, Pennsylvania 15601



412-925-8115
412-925-1310

August 17, 1981

Dr. D. R. Samples
Environmental Control
Wheeling-Pittsburgh
Duvall Center
Wheeling, WV 26003



Dear Dr. Samples:

Enclosed is a copy of pusher observations taken on August 4, 1981 and August 5, 1981 during the minister stein stack test. That equipment looked great.

After Harrisburg reviews the results of the stack test and if found to be favorable, this office will abate that portion of the consent agreement.

Sincerely,

A handwritten signature in cursive script, appearing to read "Richard Thomas".

Richard Thomas
Air Quality Specialist

RT:amg

Enclosures

cc: A & C
Pgh. Reg. Office
T. File

PUSHING

BY-PRODUCT COKE OVENS
RECORD OF VISIBLE
EMISSIONS OBSERVATIONSCOMPANY: W-DPLANT: MONESSONBATTERY: #1 #2DATE: 8/5/81

OBSERVER SIGNATURE

REPRESENTING

COMPANY () DER (X)

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS TIME OCCURRED
C-14	2:35 *	0	0	0	2:41
B-16	2:45 *	0	0	0	2:51
B-16	3:00 *	0	0	0	3:06
B-18	3:08 *	0	0	0	3:14

* Each push lasts 30 to 45 seconds

Position of Observer:

PUSHING

BY-PRODUCT COKE OVENS
RECORD OF VISIBLE
EMISSIONS OBSERVATIONSCOMPANY: W-PPLANT: MONESSONBATTERY: #1, #2DATE: 8/5/81OBSERVER SIGNATURE
Richard ThomasREPRESENTING
COMPANY () DER (X)

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS Time Quenched
B-27	9:09 [*]	0	0	0	9:12
C-27	9:24 [*]	0	0	0	9:22
B-29	9:25 [*]	0	0	0	9:38
B-2	10:24 [*]	0	0	0	10:20
C-2	10:44 [*]	0	0	0	10:46
B-4	10:55 [*]	0	0	0	10:58
C-4	11:03 [*]	0	0	0	11:04
B-6	11:20 [*]	0	0	0	11:27
C-6	11:34 [*]	0	0	0	11:36
B-8	11:45 [*]	0	0	0	11:48
C-8	11:55 [*]	0	0	0	11:58
B-10	1:21 [*]	0	0	0	1:25
C-10	1:46 [*]	0	0	0	1:52
B-12	1:58 [*]	0	0	0	2:02
C-12	2:08 [*]	0	0	0	2:14
B-14	2:24 [*]	0	0	0	2:31

* Each Push lasts 30 to 45 seconds

Position of Observer:

PUSHING
BY-PRODUCT COKE OVENS
RECORD OF VISIBLE
EMISSIONS OBSERVATIONS

APPENDIX A (CONTD)

COMPANY: W-P

PLANT: MONESSON

BATTERY: #1, #2

DATE: 8/4/81

Richard Thomas
OBSERVER SIGNATURE

REPRESENTING
COMPANY () DER X

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS >20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION >10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS TIME QUEAKED
B-27	2:12*	0	0	0	2:22
C-27	2:19*	0	0	0	2:37
B-29	2:45*	0	0	0	2:50

* Each Push lasts 30 to 45 seconds

Position of Observer:

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INTRODUCTION

This report presents the test data and results of the test program conducted by Clean Air Engineering, Inc. for the Wheeling Pittsburgh Steel Corporation.

The testing took place at their Monessen Plant Coke Ovens located in Monessen, Pennsylvania.

The work is authorized by the Wheeling Pittsburgh Steel Corporation's purchase order number 292428.

The purpose of the test was to determine the particulate emissions discharged during operation of their coke ovens.

The field portion of the testing was coordinated among the following personnel:

Mr. L. Weidle Wheeling Pittsburgh Steel Corp.

Mr. S. Korando Clean Air Engineering, Inc.

The tests were conducted during the week of August 3, 1981.

Notes and other materials added by Wheeling-Pittsburgh Steel Corporation are designated with two asterisks (**).

DESCRIPTION OF INSTALLATION AND PROCESS

The tests described in this report were conducted on the flue gas generated during the push phase of the coke oven operating cycle. Sampling took place only during the push phase and each point sampled corresponds to one push. A plant observer signaled the start and end of each push.

The particulate emissions are controlled by a baghouse collector.

All tests were conducted at the coke oven baghouse stack.

Process data concerning the operation of the coke ovens is contained in the Appendix.

DISCUSSION OF RESULTS

The most significant test conditions and results are presented in the SUMMARY OF RESULTS TABLE beginning on page 2 - 2. Additional results and test PARAMETERS are given in Section 5.

A complete copy of the VISIBLE EMISSION DATA, RAW TEST DATA and the COMPUTER ANALYSIS of the raw test data showing point by point % Isokinetic results are included in the appendix.

The particulate concentrations, in Grains/DSCF, were .0061, .0039, and .0030 for runs 1, 2 and 3 respectively.

To the best of our knowledge the enclosed data is accurate and reliable.

Respectfully Submitted,
CLEAN AIR ENGINEERING, INC.

William I. Walker, PE

Clean Air Engineering, Inc.

TABLE I
SUMMARY OF RESULTS
STACK

RUN NO.	1	2	3
DATE, 1981	August 3	August 4	August 5
TIME (Approx.)	10:20 AM to 3:00 PM	8:25AM to 4:12PM	8:15 AM to 3:52 PM
Test Method	EPA M5	EPA M5	EPA M5
Gas Temperature, °F	137	142	139
Gas Moisture, Volume %	3.4	3.1	3.1
Gas Volume			
ACFM	132,700	137,800	136,200
DSCFM	111,700	114,800	113,600
Dust Concentration			
GR/DSCF	.0061	.0039	.0030
LB/HR	5.8	3.9	3.0
** Total test duration, hours	4.5	7.9	7.9
** Coke produced, tons	193	272	272
** Actual sampling time, minutes	75	110	98
** Particulate emissions:			
Allowable	3.7	3.4	3.4
Actual	1.6	0.9	0.6

** Material added by Wheeling-Pittsburgh Steel Corporation.

SAMPLING PROCEDURES

The emission tests were conducted in accordance with the procedure specified in the Federal Register, Vol. 36, No. 247, dated December, 1971 and its revisions of August 18, 1977.

The procedures used were as follows:

1. Method 1 for sample point and velocity traverse point location.
2. Method 2 for velocity and volumetric flow.
3. Method 3 for gas analysis and molecular weight determination.
4. Method 5 for particulate concentration and moisture content.

A schematic of the sampling train is shown in Figure I. The metering equipment was design and manufactured by the Research Appliance Company in accordance with the United States Environmental Protection Agency standards.

A total of 24 points were sampled for the duration of each corresponding push cycle. A cross section of the sampling location showing the sampling points is contained in Figure II.

All equipment was calibrated at Clean Air Engineering, Inc.'s laboratory prior to shipment to the job site. Copies of the calibration data are included in the appendix of this report.

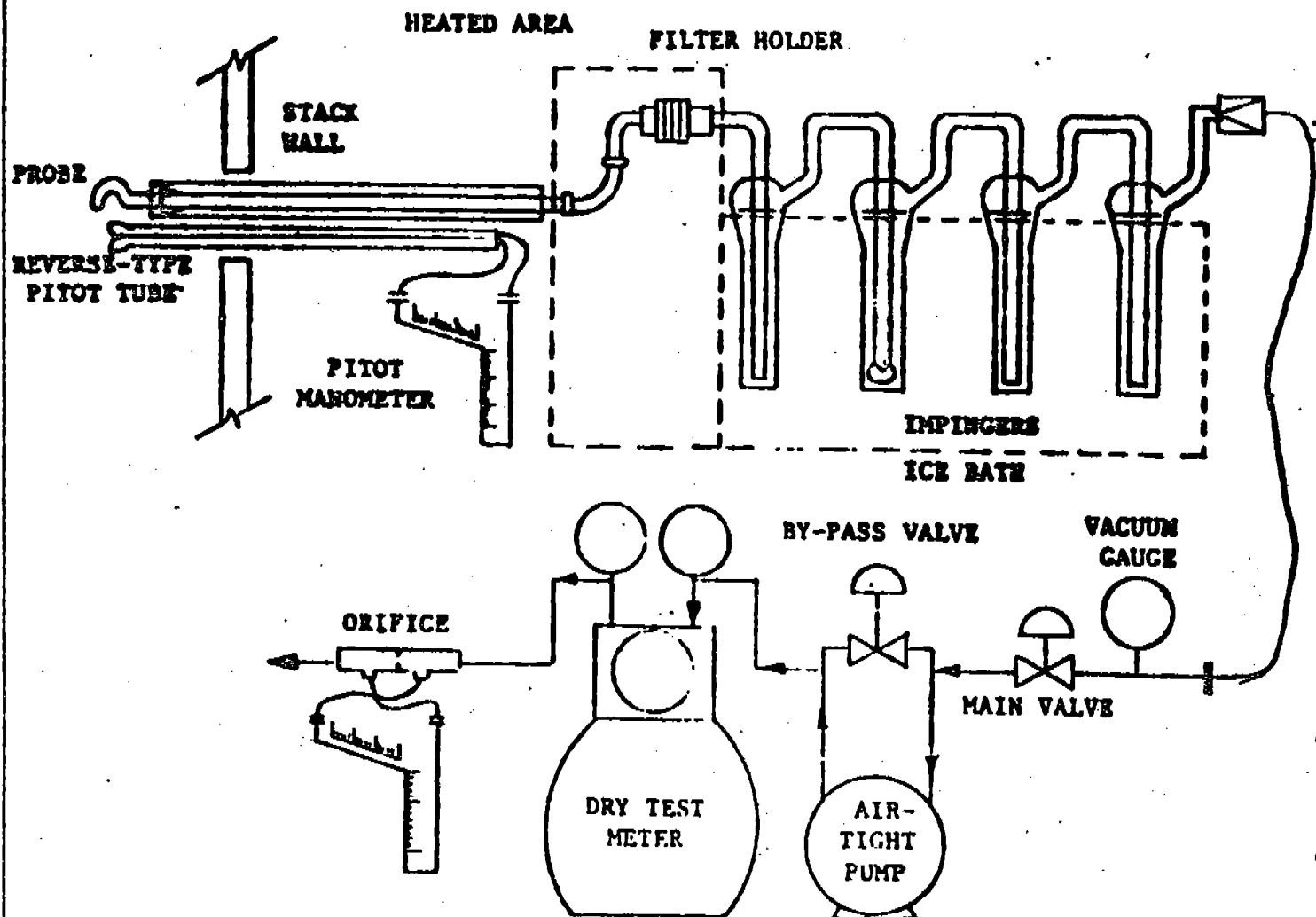


FIGURE I
SAMPLING TRAIN

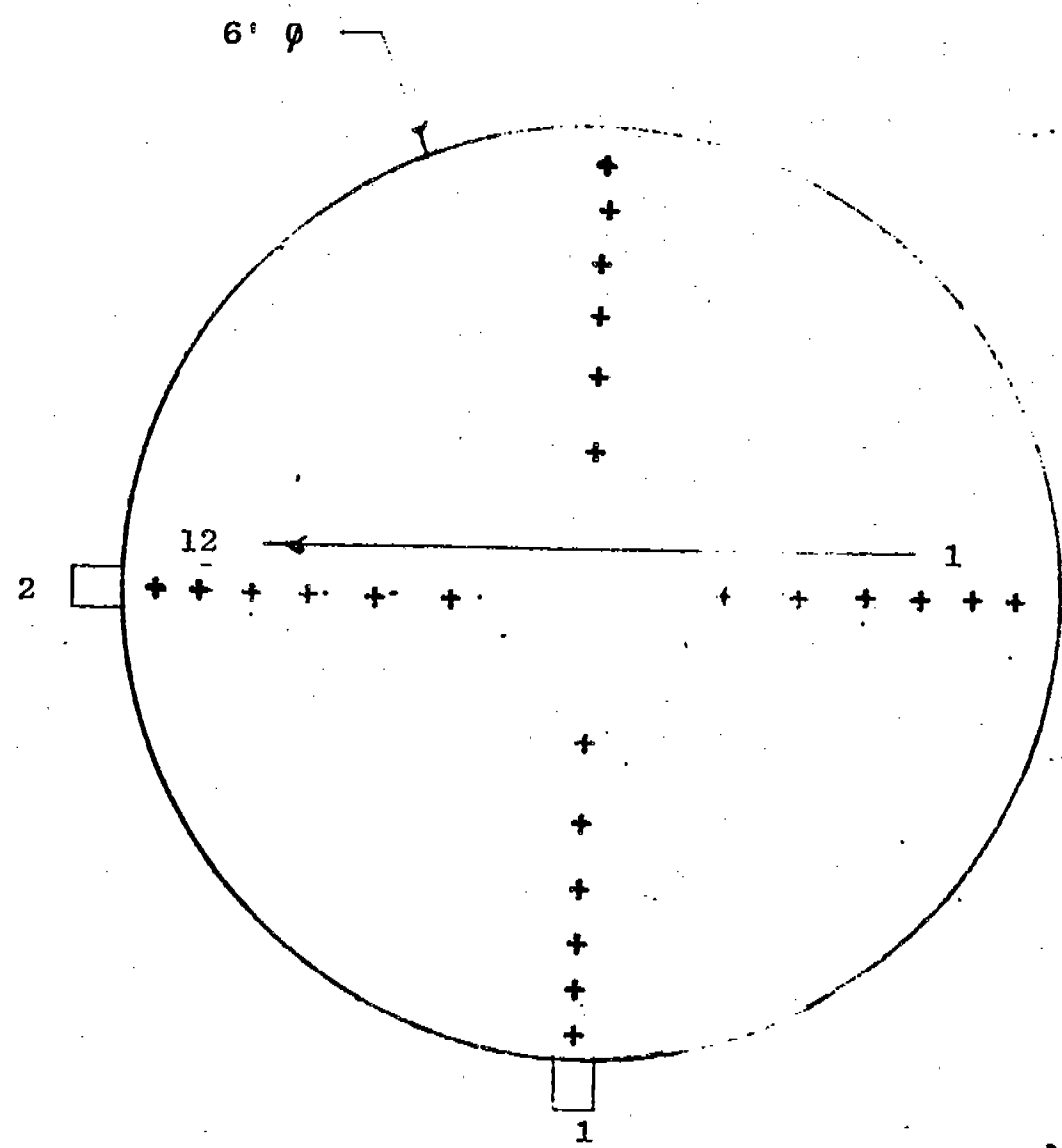


FIGURE II
CROSS SECTION OF DUCT
SHOWING SAMPLING POINT LOCATIONS

NOMENCLATURE

- A_n - Cross sectional area of nozzle, square feet.
- A_s - Cross sectional area of stack, square feet.
- B_{wo} - Proportion by volume of water vapor in the gas stream, %.
- C_p - Pitot tube coefficient, dimensionless.
- C - Concentration of particulate matter in stack gas, GR/DSCF.
- CF - Coal flow, Lb./Hr.
- HI - Heat input to boiler, 10^6 BTU/Hr.
- $\overline{DH}$ - Average pressure drop across the meter box orifice, inches H_2O .
- $(\overline{DP})^{1/2}$ - Average of square roots of velocity heads of stack gas, inches H_2O .
- $DH\theta$ - Meter orifice calibration coefficient, dimensionless.
- $\%I$ - Percent of isokinetic sampling (acceptable: $90\% \leq \%I \leq 110\%$).
- K_p - $85.49 \text{ Ft./Sec.}, \frac{[(\text{Lb./Lb.-Mole}) (\text{In. Hg})]^{1/2}}{[(^\circ R) (\text{In. } H_2O)]^{1/2}}$
- M_d - Dry molecular weight of stack gas, Lb./Lb. mole.
- M_s - Molecular weight of stack gas (wet basis), Lb./Lb. mole.
- M_n - Total amount of particulate matter collected, gm.
- P_b - Barometric pressure, inches Hg.
- P_s - Absolute stack gas pressure, inches Hg.
- P_{std} - Pressure at standard conditions, 29.92 inches Hg.
- PMR - Particulate mass rate, Lbs./Hr.

NOMENCLATURE (Continued)

- Q_a - Volumetric flow rate, actual conditions.
- Q_s - Volumetric flow rate at standard conditions.
- Q_{std} - Volumetric flow rate at standard conditions, (dry basis).
- $\overline{T_m}$ - Average dry gas meter temperature, °F.
- $\overline{T_s}$ - Average stack temperature, °F
- T_{std} - Absolute temperature at standard conditions, 528°R.
- θ - Total sampling time, minutes.
- V_{lc} - Total volume of liquid collected in impingers and silica gel, ml.
- V_m - Volume of gas sample through the dry gas meter (@ meter conditions), cubic feet.
- V_{mstd} - Volume of gas sample through the dry gas meter at standard conditions.
- V_{wstd} - Volume of water collected at 29.92" Hg and 68°F, cubic feet.
- V_s - Stack gas velocity, feet per second.
- Y_d - Meter correction factor, dimensionless.

SAMPLE CALCULATIONS - RUN #3

(Note: Results Taken from Computer Analysis)

1. Volume of Water Collected

$$\begin{aligned} V_{wstd} &= .0471 V_{lc} \\ &= (.0471) (40) \\ &= 1.88 \text{ WSCF} \end{aligned}$$

2. Volume of Gas Metered, Standard Conditions

$$\begin{aligned} V_{mstd} &= \frac{ (17.64) (V_m) \left[P_b + \frac{\overline{DH}}{13.6} \right] }{ (460 + T_m) } (Y_d) \\ &= \frac{ (17.64) (62.14) \left[29.32 + \frac{2.3}{13.6} \right] }{ (460 + 91) } (1.0010) \\ &= 58.72 \text{ DSCF} \end{aligned}$$

3. Moisture Content

$$\begin{aligned} B_{wo} &= \frac{ V_{wstd} }{ V_{mstd} + V_{wstd} } \\ &= \frac{ 1.88 }{ 58.72 + 1.88 } \\ &= .0311 \\ &= 3.1 \% \end{aligned}$$

4. Molecular Weight of Dry Gas Stream

$$\begin{aligned} M_d &= .44 (\%CO_2) + .32 (\%O_2) + .28 (\%CO + \%N_2) \\ &= .44 (\text{NEG}) + .32 (21.0) + .28 (79.0) \\ &= 28.84 \end{aligned}$$

SAMPLE CALCULATIONS (Continued)

5. Molecular Weight of Stack Gas

$$\begin{aligned} M_S &= M_d (1 - B_{WO}) + 18 (B_{WO}) \\ &= 28.84 (1 - .0311) + 18 (.0311) \\ &= 28.50 \end{aligned}$$

6. Velocity of Stack Gas

$$\begin{aligned} V_S &= K_P C_P \overline{(DP)}^{\frac{1}{2}} \frac{[T_S + 460]^{\frac{1}{2}}}{[(M_S)(P_S)]^{\frac{1}{2}}} \\ &= 85.49 (.840) (1.318) \frac{[139 + 460]^{\frac{1}{2}}}{[(28.50)(29.24)]^{\frac{1}{2}}} \\ &= 80.20 \text{ Ft./Sec.} \end{aligned}$$

7. Total Flow of Stack Gas

$$\begin{aligned} Q_a &= 60 A_S V_S \\ &= (60) (28.28) (80.20) \\ &= 136,200 \text{ ACFM} \end{aligned}$$

$$\begin{aligned} Q_{std} &= \frac{Q_a P_S (17.64) (1 - B_{WO})}{T_S + 460} \\ &= \frac{(136,200) (29.24) (17.64) (1 - .0311)}{139 + 460} \\ &= 113,600 \text{ DSCFM} \end{aligned}$$

SAMPLE CALCULATIONS (Continued)

8. Percent Isokinetic

$$\begin{aligned} \%I &= \frac{(.09450) (\bar{T}_s + 460) V_{mstd}}{P_s V_s A_n \theta (1 - B_{wo})} \\ &= \frac{(.09450) (139 + 460) (58.72)}{(29.24) (80.20) (.000193) (76.27) (1 - .0311)} \\ &= 99.4 \% \end{aligned}$$

9. Particulate Concentration

$$\begin{aligned} \text{GR/DSCF} &= \frac{(15.43) (M_n)}{V_{mstd}} \\ &= \frac{(15.43) (.0116)}{58.72} \\ &= .0030 \\ \text{LB/HR} &= \frac{(\text{GR/DSCF}) (Q_{std}) (60)}{7000} \\ &= \frac{(.0030) (113,600) (60)}{7000} \\ &= 2.968 \end{aligned}$$

** NOTE: The above calculation assumes that emissions and sampling were continuous. Actual duration of test #3 was 7.9 hours with 98 minutes actual testing. Therefore, actual emissions from pushing in pounds per hour were

$$= 2.97 \times \frac{98 \text{ minutes}}{7.9 \text{ hours}} \times \frac{1 \text{ hour}}{60 \text{ minutes}} = 0.6$$

**** Allowable Emissions**

Pa.DER Regulation 123.13(b)

$$A = 0.76 E^{0.42}$$

where A = Allowable emissions, pounds per hour

$$E = F \times W$$

F = Emission factor, 1.0 for pushing

W = Process weight in tons of coke per hour.

For Run #3

$$\begin{aligned} A &= 0.76 \left(1.0 \times \frac{272 \text{ tons of coke}}{7.9 \text{ hours}} \right)^{0.42} \\ &= 3.4 \text{ pounds per hour.} \end{aligned}$$

PARAMETER SHEET

RUN NO.	1	2	3
P _b	29.39	29.40	29.32
P _s	29.48	29.32	29.24
V _m	60.04	94.33	62.14
$\overline{DH}$	2.2	2.3	2.3
$\overline{T_m}$	97	92	91
V _{mstd}	56.24	89.23	58.72
V _{lc}	42	60	40
V _{wstd}	1.98	2.83	1.88
B _{wo}	.0340	.0307	.0311
%O ₂	21.0	21.0	21.0
%CO ₂	.0	.0	.0
M _d	28.84	28.84	28.84
M _s	28.47	28.51	28.50
C _p	.840	.840	.840
$\overline{T_s}$	137	142	139
$(DP)^{\frac{1}{2}}$	1.29	1.33	1.32
V _s	78.2	81.2	80.2
A _s	28.27	28.27	28.27
A _n	.000193	.000193	.000193
%I	99.3	99.4	99.4
Y _d	1.0010	1.0010	1.0010
θ	74.4	114.8	76.3
M _n	.0221/.1017*	.0228/.0863*	.0116/.0363*
DHθ	1.920	1.920	1.920

* Front Half/Front Half & Back Half

APPENDIX

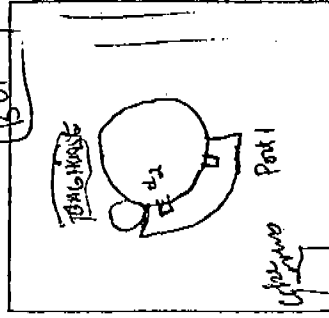
RAW TEST DATA

Client/Owner Wheeling Pittsburgh Steel Corp
 Plant Monaca
 Unit# One Over Inlet/Outlet Baghouse
 Operator S. Koryun + D. Basile
 Date 8-3-81
 Run No. 1
 Sample Box No. 17
 Meter Box No. 1
 Meter DH@ 1920
 K Factor 1.3
 Pilot Cp 1.84 Pilot Leak Ck Yrs
 Leak Rate Before 0.00 CFM @ 14 Hg
 Leak Rate After 0.00 CFM @ 5 Hg
 Static Press., In. H₂O (+/-) +1.0

Start Time 10:20 PM AM
 Finish Time 3:00 PM AM
 Meter Yd 10010

PARTICULATE TESTING

RAW DATA SET



SCHEMATIC OF TESTING LOCATION

TRAVERSE POINT NUMBER	MIN/PT _____	VACUUM In. Hg	STACK TEMPERATURE T _s , °F	VELOCITY HEAD DP _s	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER DH, In. H ₂ O	Initial Volume: 591.80	GAS SAMPLE TEMPERATURE AT DRY GAS METER		TEMP. OF GAS LEAVING CONDENSER OR LAST IMPINGER T _c , °F	SAMPLE BOX TEMPERATURE T _b , °F	
							GAS SAMPLE VOLUME V _m , Ft ³	INLET T _m in., °F			
								OUTLET T _m out., °F			
1.1	5:21 5:20 10:20	2.0	123	2.0	2.6	596.455	92	82	67	230	
5.15	3:50 10:10	2.0	150	2.0	2.6	599.885	96	88	67	250	
11.3	8:17 8:15	2.0	140	2.1	2.7	607.32	104	92	69	248	
23.4	4:38 11:15	2.0	141	2.1	2.7	611.54	108	99	69	249	
48	3:20 11:28	2.0	137	2.0	2.6	614.48	102	98	69	250	
54	4:00 11:39	2.0	127	2.0	2.6	618.005	98	96	67	254	
60	2:23 11:42	2.0	134	1.5	1.95	619.95	100	95	67	253	
65	7:11 12:03	2.0	120	1.45	1.86	625.34	98	95	65	253	
85	6:35 1:20	2.0	110	1.4	1.75	630.11	93	86	64	246	
10	3:03 1:35	2.0	135	1.15	1.4	632.11	94	89	64	249	
11	4:34 1:40	2.0	135	1.1	1.4	635.086	102	92	63	254	
12	2:42 1:56	2.0	119	.78	98	636.587	98	94	64	248	
TOTAL							AVG.	AVG.			
AVERAGE							AVG.	AVG.			

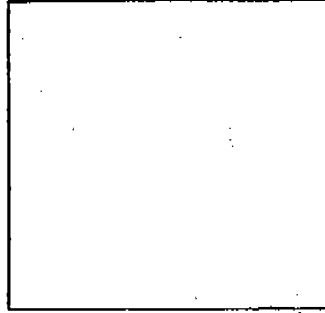
Ambient Temperature, °F 78
 Barometric Pressure, In. Hg 29.39
 Assumed Moisture, % 3.5
 Heater Box Setting 250
 Probe Length, Ft. 8 No. 28
 Nozzle Diameter, In. 1/8
 Probe Heater Setting 30%
 % O₂ 21.0
 % CO₂ 0.0
 H₂O, ml 46
 Silica Gel, gm 46
 Total Vlc 46
 Stack Area, Ft² 6 28.285
 Pyrometer No. 13

Filter #'s 30067
 Thimble # 204
 Beaker # 14, A4, 3

PARTICULATE TESTING RAW DATA SET

Client/Owner WSPC
 Plant Monessen
 Unit# Coke Oven Inlet/Outlet to Baghouse
 Operator D. Doyle & S. Korman
 Date 8-3-81
 Run No. 1
 Sample Box No. 12
 Meter Box No. 1
 Meter DH@ 1
 K Factor
 Pitot Cp Pitot Leak Ck
 Leak Rate Before CFM @ Hg
 Leak Rate After CFM @ Hg
 Static Press., In. H₂O 1.3

Start Time AM
PM
 Finish Time AM
PM
 Meter Yd



SCHEMATIC OF TESTING LOCATION
 5102 3.513

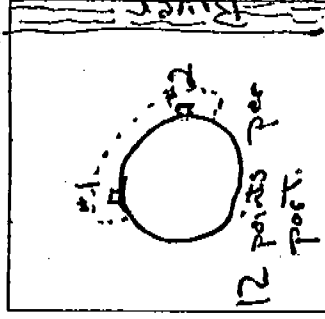
Filter #s
 Thimble #
 Beaker #
 Ambient Temperature, °F
 Barometric Pressure, in. Hg
 Assumed Moisture, %
 Heater Box Setting
 Probe Length, Ft. No.
 Nozzle Diameter, in.
 Probe Heater Setting
 % O₂
 % CO₂
 H₂O, ml
 Silica Gel, gm
 Total V_{lc}
 Stack Area, Ft²
 Pyrometer No.

TRAVERSE POINT NUMBER	MIN/PT	SAMPLING TIME θ, min.	VACUUM In. Hg	STACK TEMPERATURE T _s , °F	VELOCITY HEAD DP _s	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER DH, in. H ₂ O	Initial Volume: GAS SAMPLE VOLUME V _m , Ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		TEMP. OF GAS LEAVING CONDENSER OR LAST IMPINGER T _c , °F	SAMPLE BOX TEMPERATURE T _b , °F
								INLET T _m in. °F	OUTLET T _m out. °F		
2-1	4:25	2:08	2.0	154	1.6	2.10	640.10	104	95	69	248
2	3:37	2:20	2.0	156	1.7	2.25	643.04	104	97	68	250
3	5:41	2:31	2.0	151	1.8	2.31	647.865	109	100	70	255
4	2:47	2:46	2.0	166	1.8	2.3	650.17	105	100	69	261
5	2:01	2:57	2.0	172	1.7	2.122	651.84	105	100	68	260
6											
7											
8											
9											
10											
11											
12											
TOTAL	74.42							AVG.	AVG.		
AVERAGE	77.75			144	1.241	2.17	66.04	AVG.	97		

Client/Owner Wheeling-Pittsburgh Steel
 Plant Monsieaux
 Unit# Coke Inlet/Outlet Stack
 Operator Daggle
 Date 8-4-81
 Run No. 2
 Sample Box No. 12
 Meter Box No. 1
 Meter DH@ 1920
 K Factor 13
 Pitot Cp .84 Pitot Leak Ck 012
 Leak Rate Before 0.00 CFM @ 10' Hg
 Leak Rate After .00 CFM @ 5 Hg
 Static Press.: In. H₂O (+/-) -1.1

Start Time 8:15 AM
 Finish Time 4:12 PM
 Meter Yd 1.0010

PARTICULATE TESTING RAW DATA SET



SCHEMATIC OF TESTING LOCATION

(2)

Ambient Temperature, °F 77
 Barometric Pressure, In. Hg 29.40
 Assumed Moisture, % 3.5
 Heater Box Setting 2.50
 Probe Length, Ft. 6' No.
 Nozzle Diameter, In. 3.0
 Probe Heater Setting 2.0
 % O₂ 21.2 21.0
 % CO₂ 0.0 0.0
 H₂O, ml 3.2
 Silica Gel, gm 2.8
 Total Vic 6.0
 Stack Area, Ft² 28.27
 Pyrometer No. # 13

Filter #'s 3010, 203
 Thimble #
 Beaker # 23, 22, 10

TRAVERSE POINT NUMBER	MIN/PT	SAMPLING TIME θ, min	VACUUM In. Hg	STACK TEMPERATURE T _s , °F	VELOCITY HEAD DP _s	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER DH, In. H ₂ O	Initial Volume: GAS SAMPLE VOLUME V _m , Ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		TEMP. OF GAS LEAVING CONDENSER OR LAST IMPINGER T _c , °F	SAMPLE BOX TEMPERATURE T _b , °F
								INLET T _m in, °F	OUTLET T _m out, °F		
1	8:25	8:14	2	111	2.2	3.0	59.84	88	75	66	252
2	8:42	9:02	2	124	2.1	2.8	66.43	94	80	66	254
3	8:51	9:10	2	121	2.3	3.0	72.73	91	84	64	250
4	9:17	9:30	2	142	2.2	2.9	75.34	97	88	67	252
5	9:38	9:10	2	139	2.522	3.529	78.52	100	91	69	255
6	10:35	9:51	2	145	2.2	2.9	81.19	102	85	69	251
7	10:47	9:57	2	146	2.0	2.6	84.37	103	96	66	251
8	10:59	9:57	2	152	1.5	2.0	86.48	98	95	66	254
9	11:08	9:31	2	137	1.5	2.0	92.31	98	93	68	257
10	11:24	9:36	2	145	1.7	1.6	95.40	95	91	64	250
11	11:40	9:50	2	143	1.2	1.6	98.06	92	90	67	247
12	11:56		1	123	9.5	1.2	102.91	96	90	69	253
TOTAL								AVG.	AVG.		
AVERAGE								AVG.	AVG.		

PARTICULATE TESTING RAW DATA SET

Client/Owner WPS
 Plant Monsieur
 Unit# Coke Inlet/Outlet
 Operator Doedle
 Date 8-4-81
 Run No. 2
 Sample Box No. _____
 Meter Box No. _____
 Meter DH @ _____
 K Factor _____
 Pitot Cp _____
 Leak Rate Before _____ CFM @ _____ Hg
 Leak Rate After _____ CFM @ _____ Hg
 Static Press., in. H₂O (+/-) -1.1

Start Time AM
PM
 Finish Time AM
PM
 Meter Yd _____

Filter #'s _____
 Thimble # _____
 Beaker # _____

K's
110-120 = 1.35
120-150 = 1.30
150-170 = 1.26

Ambient Temperature, °F _____
 Barometric Pressure, in. Hg _____
 Assumed Moisture, % _____
 Heater Box Setting _____
 Probe Length, Ft. _____ No. _____
 Nozzle Diameter, in. _____
 Probe Heater Setting _____
 % O₂ _____
 % CO₂ _____
 H₂O, ml _____
 Silica Gel, gm _____
 Total V₁₀ _____
 Stack Area, Ft.² _____
 Pyrometer No. _____

SCHEMATIC OF TESTING LOCATION

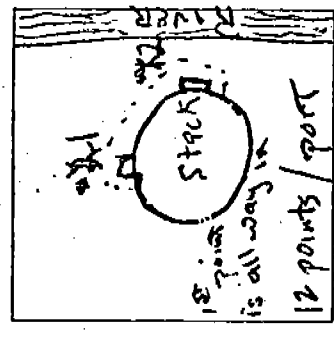
TRAVERSE, POINT NUMBER	MIN/PT	SAMPLING TIME θ, min.	VACUUM in. Hg	STACK TEMPERATURE T _s , °F	VELOCITY HEAD DP _s	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER DH, in. H ₂ O	Initial Volume: GAS SAMPLE VOLUME V _m , Ft. ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		TEMP. OF GAS LEAVING CONDENSER OR LAST IMPINGER T _c , °F	SAMPLING BOX TEMPERATURE T _p , °F
								INLET T _m in, °F	OUTLET T _m out, °F		
1	12:11	5:38	2	136/151	2.0	2.6	117.85	98	91	70	241
2	1:02	7:20	2	271/39	2.0	2.6	114.26	91	86	64	238
3	1:18	9:04	2	151	2.1	2.7	117.87	93	85	65	255
4	1:30	3:07	2	156	1.9	2.5	120.56	93	87	67	245
5	1:42	7:44	2	161	2.0	2.6	121.38	95	88	63	247
6	1:59	3:03	2	166	1.8	2.3	129.90	94	89	65	246
7	2:10	3:30	2	165	1.9	2.4	132.86	95	89	65	245
8	2:21	4:52	2	148/161	1.7	2.1	136.73	97	90	64	253
9	2:33	3:34	2	167	1.7	2.1	139.61	96	90	66	258
10	2:50	3:04	2	163	1.4	1.8	141.15	97	91	66	246
11	3:44	4:25	2	131	1.3	1.6	144.24	97	91	62	255
12	3:55	2:30	2	127	1.3	1.6	145.98	98	92	66	261
TOTAL	4:12	2:00	2	139	1.3	1.6	147.28	AVG. 97	AVG. 92	67	255
AVERAGE							148.22	AVG.			

*-Run does not count, no push. Clean Air Engineering, Inc.

Client/Owner Wheeling-Pittsburgh Steel
 Plant Monsieur
 Unit# Coke Inlet/Outlet Stack
 Operator Doyle
 Date 8-5-81
 Run. No. 3
 Sample Box No. 7
 Meter Box No. 1
 Meter DH @ 1.920
 K Factor 1.3
 Pitot Cp 54 Pitot Leak Ck ✓
 Leak Rate Before 0.00 CFM @ 6" Hg
 Leak Rate After 0.00 CFM @ 6" Hg
 Static Press., In. H₂O (+/-) -1.1

Start Time 8:16 AM
 Finish Time 3:52 PM
 Meter Yd 1.0010

**PARTICULATE TESTING
RAW DATA SET**



Filter # 3008, 100
 Thimble # 188
 Beaker # 307, B2, A6
 Ambient Temperature, °F 75
 Barometric Pressure, In. Hg 29.32
 Assumed Moisture, % 3.5
 Heater Box Setting 7070
 Probe Length, Ft. 6 No. 188
 Nozzle Diameter, In. 1.88
 Probe Heater Setting 8070
 % O₂ 21.0
 % CO₂ 0.0
 H₂O, ml 5.2
 Silica Gel, gm 18
 Total Vol. 40
 Stack Area, Ft² 27.28
 Pyrometer No. Fluke 33

SCHEMATIC OF TESTING LOCATION

TRAVERSE POINT NUMBER	MIN/PT	SAMPLING TIME θ, min.	VACUUM In. Hg	STACK TEMPERATURE T _s , °F	VELOCITY HEAD DP _s	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER DH, In. H ₂ O	Initial Volume: GAS SAMPLE VOLUME V _m , Ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		TEMP. OF GAS LEAVING CONDENSER OR LAST IMPINGER T _c , °F	SAMP BOX TEMPERATURE T _b , °F
								T _m in, °F	T _m out, °F		
1	8:16	2:18	4	133	2.0	2.6	50.42	97	81	63	269
2	8:26	2:16	3	138	2.1	2.7	53.21	93	84	64	254
3	9:00	3:20	3	134	2.3	3.0	56.18	97	89	64	250
4	9:12	2:52	3	141	2.1	2.7	58.74	94	89	66	255
5	9:24	4:33	3	148	2.3	3.0	60.02	97	90	67	252
6	9:42	2:29	3	147	2.1	2.7	65.25	94	90	68	248
7	10:22	6:29	2	124	1.6	2.1	70.41	90	85	67	257
8	10:46	2:37	2	128	1.5	2.0	72.41	92	86	67	255
9	10:57	2:17	2	135	1.3	1.7	74.44	93	87	64	240
10	11:09	3:31	2	136	1.3	1.7	76.95	94	89	66	246
11	11:26	3:11	2	132	1.1	1.4	79.05	93	90	66	259
12	11:42	2:40	1	113	86	1.1	80.57	93	90	67	241
TOTAL							AVG.	AVG.	AVG.		
AVERAGE							AVG.	AVG.	AVG.		

Client/Owner WPSC
 Plant Nonessen
 Unit# Coke Inlet/Outlet
 Operator DEBCE
 Date 8-5-81
 Run No. 3
 Sample Box No. _____
 Meter Box No. _____
 Meter DH @ _____
 K Factor _____
 Pilot Cp _____
 Leak Rate Before _____ CFM @ _____ Hg
 Leak Rate After _____ CFM @ _____ Hg
 Static Press., In. H₂O (+/-) -1.1

**PARTICULATE TESTING
RAW DATA SET**

Start Time AM PM
 Finish Time AM PM
 Meter Yd

K-factors
 100-130° = 1.33
 130-150° = 1.3
 150-170° = 1.33/1.26

Ambient Temperature, °F _____
 Barometric Pressure, In. Hg _____
 Assumed Moisture, % _____
 Heater Box Setting _____
 Probe Length, Ft. _____ No. _____
 Nozzle Diameter, In. _____
 Probe Heater Setting _____
 % O₂ _____
 % CO₂ _____
 H₂O, ml _____
 Silica Gel, gm _____
 Total Vic _____
 Stack Area, Ft.² _____
 Pyrometer No. _____

Filter #s _____
 Thimble # _____
 Beaker # _____

SCHEMATIC OF TESTING LOCATION

TRAVERSE POINT NUMBER	MIN/PT	SAMPLING TIME θ, min.	VACUUM In. Hg	STACK TEMPERATURE T _s , °F	VELOCITY HEAD DP, in. H ₂ O	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER DH, in. H ₂ O	Initial Volume: GAS SAMPLE VOLUME V _m , Ft. ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		TEMP. OF GAS LEAVING CONDENSER OR LAST IMPINGER T _c , °F	SAMPLING BOX TEMPERATURE T _b , °F
								INLET T _m in, °F	OUTLET T _m out, °F		
2-1	11:48	2:58	2	146	1.8	2.3	83.03	94	89	68	249
2	11:58	2:25	2	158	1.9	2.5	85.13	94	89	70	240
3	1:25	3:41	3	124	1.8	2.3	88.24	94	88	62	257
4	1:42	1:56	3	140	1.8	2.3	94.85	93	88	64	255
5	2:21	2:14	3	146	1.8	2.3	96.74	92	88	66	253
6	2:11	3:15	3	157	1.9	2.5	99.54	95	89	68	257
7	2:27	2:42	2	150	1.6	2.0	101.64	94	89	66	253
8	2:49	2:35	3	165	2.0	2.5	103.86	92	89	65	257
9	2:50	1:55	3	150	2.0	2.5	105.38	92	88	64	260
10	3:04	2:13	2	143	1.1	2.2	107.26	91	89	66	258
11	3:12	2:07	2	140	1.6	2.1	108.93	91	89	66	247
12	3:52	2:13	2	129	1.5	2.0	110.64	91	87	67	255
TOTAL							AVG.	AVG.	AVG.		
AVERAGE							AVG.	AVG.	AVG.		

* Change sample boxes: 7-12
 New start volume = 88.24

WEIGHT SHEET

BALANCE: P.HUNIT: COKE OVEN BAG HOUSEOPERATOR: SSKRUN(S): 1-3SHEET # 1 of 1DATE: 8-3-81

WEIGH SHEET

RUN#	WT#	FILTER # OR IDENTIFICATION	T,F,B	WASH		GROSS	TARE	NET
				ML	CORR.			
---	1	BLANK # 24	B	150	---	104.9393	104.9389	.0004
1	2	# 3 ✓	B	200		101.9513	101.9274	.0239
2	3	23 ✓	B	250		105.6180	105.5921	.0259
3	4	307 ✓	B	250		110.6865	110.6703	.0162
	5							
3	6	30008 ✓	F			.5509	.5548	-.0039
1	7	30007 ✓	F			.5566	.5579	-.0013
2	8	30010 ✓	F			.5509	.5532	-.0024
	9							
	10							
1	11	204 ✓	F			.1000	.0990	.0010
2	12	203 ✓	F			.1018	.1014	.0004
3	13	202 ✓	F			.1006	.0996	.0010
	14	H ₂ O BLANK 12	B	150		92.9358	92.9358	.0000
2	15	22 ✓	B	200		107.5928	107.5784	.0144
1	16	14 ✓	B	75		102.3520	102.3473	.0047
3	17	B2 ✓	B	150		97.5735	97.5545	.0140
1	18	A4 ✓				94.2912	94.2233	.0739
2	19	10 ✓				101.3095	101.2608	.0487
3	20	A6 ✓				96.0032	95.9935	.0097

CALIBRATION DATA

POST TEST CALIBRATION CHECK

DATE 8-6-81

Operator: P. Davis

METER BOX VACUUM: 3" Hg

METER BOX $\bar{Y}_d$ 10010

BAROMETRIC PRESSURE (Pb): 29.03

METER BOX: I

	AH	AP	Yds	Standard Meter Gas Volume (ft. ³)			(Vds) NET	Meter Box Gas Volume (ft. ³)			(Vd) NET	Standard Meter Temperature (°F)			Meter Box Temperature (°F)			TIME (Min.)	Yd	ΔH@
				INITIAL	FINAL			INITIAL	FINAL			IN	OUT	AVG	Tds	IN	OUT			
20		3.2	9942	49.975	61.046	11.071		44.600	56.000	11.400	82 81 81	76 76 76	78.7 78.1 78.5	110 111 112	90 93 95		14.56	9909		
20		3.2	9942	61.046	72.120	11.074		56.000	67.500	11.500	81 80 81	76 76 76	78.3 78.3 78.3	112 113 114	96 97 99		14.62	9920		
20		3.2	9942	72.100	84.111	12.011		67.500	80.000	12.500	81 80 80	76 77 77	78.3 78.3 78.3	114 115 116	100 100 101		15.88	9942		

Q = Flow Rate (cfm)

ΔH = Orifice pressure differential (in. H₂O)

AP = Inlet pressure differential standard meter (in. H₂O)

Yds = Standard meter correction factor (unitless)

Yd = Meter box correction factor (unitless)

ΔH@ = Orifice pressure differential that gives 0.75 cfm of air at 70°F and 29.92" Hg (in. H₂O)

$$Y_d = (Y_{ds}) \left(\frac{V_{ds}}{V_d} \right) \left(\frac{T_d + 460}{T_{ds} + 460} \right) \left(\frac{P_b + \Delta P/13.6}{P_b + \Delta H/13.6} \right)$$

$$\Delta H@ = \frac{0.0317 \Delta H}{P_b (T_d + 460)} \left[\frac{(T_{ds} + 460) \theta}{V_{ds} \cdot Y_{ds}} \right]$$

METER BOX CALIBRATION

DATE: 8-2-81

OPERATOR: [Signature]

Meter Box: I

BAROMETRIC PRESSURE (Pb): 29.68

Q	ΔH	ΔP	Yds	STANDARD METER GAS VOLUME (ft³)		METER BOX GAS VOLUME (ft³)		STANDARD METER TEMP. (°F)		METER BOX TEMP. (°F)		TIME (MIN)	Yd
				INITIAL	FINAL	INITIAL	FINAL	IN	OUT	IN	OUT		
39	0.5	-1.0	10143	14.665	20.180	5.515	9.500	67.5	67.5	74.5	74.5	4.00	10118
92	3.0	-3.5	9788	20.180	32.630	12.450	15.200	67.5	67.5	74.5	74.5	13.58	9935
92	3.0	3.5	9788	32.630	43.555	10.925	27.900	67.5	67.5	74.5	74.5	11.70	9963
69	1.7	-2.3	9950	43.555	43.685	10.130	39.100	67.5	67.5	74.5	74.5	14.50	1.0088
69	1.7	-2.3	9950	43.685	64.350	10.665	49.600	67.5	67.5	74.5	74.5	15.25	1.0038
39	0.5	-1.0	10143	64.350	70.710	6.360	60.700	67.5	67.5	74.5	74.5	16.15	1.0155
												Avg: 1.0058	

ΔH = Orifice pressure differential that gives 0.75 cfm at 70°F and 29.92" Hg (in. H₂O)

Q = Flow Rate (cfm)
 ΔH = Orifice Pressure differential (in. H₂O)
 ΔP = Standard Meter inlet pressure differential (in. H₂O)
 Yds = Standard Meter Correction Factor
 Yd = Meter Box Correction Factor

$$Yd = \frac{(Yds) Vds}{Vd} \quad Td + 460 \quad Pb + \frac{\Delta P}{13.6}$$

$$\Delta H = \frac{0.0317 \cdot \Delta H}{Pb (Td + 460)} \left[\frac{(Td + 460) \theta}{Vds \cdot Yds} \right]^2$$

PROCESS DATA

PROCESS DATA

Net Coking Time
Per Oven 17.5 Hours

Average Coal Charge
Per Oven 17 Tons

Total Amount of
Coke Pushed

Test 1 193 Tons

Test 2 272 Tons

Test 3 272 Tons

Number of Ovens
In Operation .56

Rated Maximum Normal
Operating Capacity 918 Tons/Day

Operating Rate
During Test Period 817 Tons/Day

COKE OVEN SAMPLING SCHEDULE

TEST #1

AUGUST 3, 1981

<u>OVEN #</u>	<u>HOOD IN PLACE</u>	<u>HOOD DROPPED</u>	<u>SAMPLE POINT</u>
B-24	10:28 AM	10:38 AM	1 - 1
C-24	10:40 AM	10:45 AM	1 - 2
B-26	10:57 AM	11:00 AM	1 - 3
C-26	11:15 AM	11:19 AM	1 - 4
B-28	11:29 AM	11:33 AM	1 - 5
B-1	11:41 AM	11:45 AM	1 - 6
C-1	11:54 AM	11:57 AM	1 - 7
B-3	12:06 PM	12:12 PM	1 - 8
C-3	1:21 PM	1:28 PM	1 - 9
B-5	1:38 PM	1:41 PM	1 - 10
C-5	1:49 PM	1:53 PM	1 - 11
B-7	2:00 PM	2:03 PM	1 - 12
C-7	2:11 PM	2:15 PM	2 - 1
B-9	2:23 PM	2:26 PM	2 - 2
C-9	2:33 PM	2:39 PM	2 - 3
B-11	2:46 PM	2:49 PM	2 - 4
C-11	2:56 PM	2:59 PM	2 - 5

COKE OVEN SAMPLING SCHEDULE

TEST #2

AUGUST 4, 1981

<u>OVEN #</u>	<u>HOOD IN PLACE</u>	<u>HOOD DROPPED</u>	<u>SAMPLE POINT</u>
C-7	8:22 AM	8:31 AM	1 - 1
B-9	8:39 AM	8:46 AM	1 - 2
C-9	8:55 AM	9:01 AM	1 - 3
B-11	9:11 AM	9:14 AM	1 - 4
C-11	9:30 AM	9:33 AM	1 - 5
B-13	10:33 AM	10:36 AM	1 - 6
C-13	10:45 AM	10:48 AM	1 - 7
B-15	10:57 AM	10:59 AM	1 - 8
C-15	11:08 AM	11:15 AM	1 - 9
B-17	11:24 AM	11:28 AM	1 - 10
C-17	11:41 AM	11:45 AM	1 - 11
B-19	11:54 AM	12:01 PM	1 - 12
C-19	12:09 PM	12:15 PM	2 - 1
B-21	12:59 PM	1:07 PM	2 - 2
C-21	1:17 PM	1:21 PM	2 - 3
B-23	1:29 PM	1:32 PM	2 - 4
C-23	1:40 PM	1:47 PM	2 - 5
B-25	1:57 PM	2:00 PM	2 - 6
C-25	2:08 PM	2:12 PM	2 - 7
B-27	2:19 PM	2:24 PM	2 - 8
C-27	2:35 PM	2:39 PM	2 - 9
B-29	2:48 PM	2:50 PM	2 - 10
B-2	3:45 PM	3:49 PM	2 - 11
B-4	4:15 PM	4:17 PM	2 - 12

COKE OVEN SAMPLING SCHEDULE

TEST #3

AUGUST 5, 1981

<u>OVEN #</u>	<u>HOOD IN PLACE</u>	<u>HOOD DROPPED</u>	<u>SAMPLE POINT</u>
C-23	7:59 AM	8:15 AM	1 - 1
B-25	8:23 AM	8:27 AM	1 - 2
C-25	8:56 AM	9:00 AM	1 - 3
B-27	9:09 AM	9:12 AM	1 - 4
C-27	9:21 AM	9:27 AM	1 - 5
B-29	9:35 AM	9:37 AM	1 - 6
B-2	10:19 AM	10:26 AM	1 - 7
C-2	10:44 AM	10:46 AM	1 - 8
B-4	10:55 AM	10:58 AM	1 - 9
C-4	11:06 AM	11:10 AM	1 - 10
B-6	11:23 AM	11:27 AM	1 - 11
C-6	11:34 AM	11:36 AM	1 - 12
B-8	11:45 AM	11:48 AM	2 - 1
C-8	11:56 AM	11:59 AM	2 - 2
B-10	1:22 PM	1:25 PM	2 - 3
C-10	1:34 PM	1:51 PM	2 - 4
B-12	1:59 PM	2:01 PM	2 - 5
C-12	2:08 PM	2:12 PM	2 - 6
B-14	2:22 PM	2:28 PM	2 - 7
C-14	2:36 PM	2:39 PM	2 - 8
B-16	2:48 PM	2:50 PM	2 - 9
C-16	3:01 PM	3:03 PM	2 - 10
B-18	3:09 PM	3:12 PM	2 - 11
C-18	3:52 PM	3:55 PM	2 - 12

VISIBLE EMISSION DATA

OPACITY READINGS

SHEET 1 OF 3

MIN. \ SEC.	0	15	30	45
0 10:22	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 10:39	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11 10:57	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 11:14	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 11:27	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28 11:40	0	0	0	0
29	0	0	0	0

Observation Data

Plant WHEELING PCH. STEEL, MUNESSEN

Stack Location BAGHOUSE FOR CORE

QUEENS

Observer THOMAS A. NAZAREK

Date AUG. 3 1981

Time _____

Distance To Stack 300'

SKY - OVERCAST GREY

Wind Direction FROM SOUTH EAST

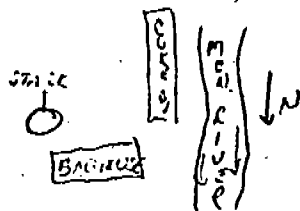
Wind Speed ≈ 5 MPH

Sum Of Numbers Recorded 0

Total Number Of Readings 120

Opacity = $\frac{\text{Sum of nos. recorded}}{\text{Total no. readings}}$

= 0



Steel Air Engineering, Inc.

ADPSELF

OPACITY READINGS

SHEET 2 OF 2

MIN. \ SEC.	0	15	30	45
0	0	0	0	0
1	0	0	0	0
2 11:02	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5 12:04	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 1:20	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 1:35	0	0	0	0
19 1:36	0	0	0	0
20	0	0	0	0
21 1:46	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 1:58	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29				

Observation Data

Plant MONESSEN - WHEELING PGM.

Stack Location COKE OVEN BAYHOUSE

Observer THOMAS A. NAZAREK

Date 8-3-81

Time WITH COKE PUSHES

Distance To Stack 300

AT 1300

25°F AMB 29.30" Hg Pb 66% REL. HUMIDITY

Wind Direction SE

Wind Speed ~5 mph

Sum Of Numbers Recorded _____

Total Number Of Readings _____

Opacity = $\frac{\text{Sum of nos. recorded}}{\text{Total no. readings}}$

= _____

SOURCE NAME
WHEELING-PITTSBURGH STEEL-MONNESSEN MILL
 ADDRESS
MONNESSEN

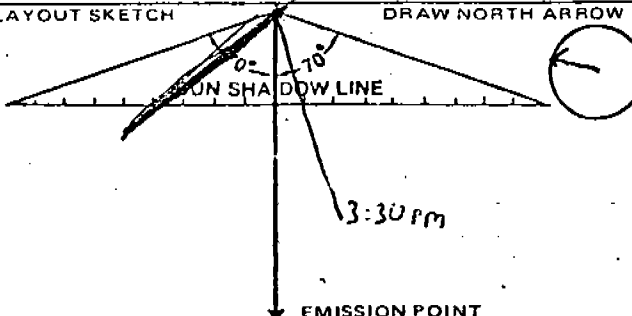
ENGINEER'S NAME (PRINT)
THOMAS A. NAZAREK
 ORGANIZATION
CLEAN AIR ENGINEERING, INC.
 CERTIFIED BY
EASTERN TECH. ASSOC. DATE
4-81

STATE
PA ZIP
 TELEPHONE
 TUPLE ID NUMBER
 OBSERVATION DATE
8-3-81
 PROCESS
COKE OVENS
 CONTROL EQUIPMENT
HOOD-BAGHOUSE
 DESCRIBE EMISSION POINT
SHORT STACK
 HEIGHT ABOVE GROUND LEVEL
105 HEIGHT RELATIVE TO OBSERVER
105
 DISTANCE FROM OBSERVER
250' DIRECTION FROM OBSERVER
SW

DESCRIBE EMISSIONS
NONE - NO VISIBLE EMISSIONS
 EMISSION COLOR
COLORLESS PLUME TYPE ☐ INTERMITTENT
☐ CONTINUOUS ☐ FUGITIVE ☐
 WATER DROPLETS PRESENT
 NO ☒ YES ☐ IF YES, IS PLUME
 ATTACHED ☐ DETACHED ☐

AT WHAT POINT WAS OPACITY DETERMINED
DIRECTLY ABOVE STACK
 DESCRIBE BACKGROUND (1400)
WAS OVERCAST - NOW APPROX 20% CLOUDS
 BACKGROUND COLOR
WHITE-HAZY BLUE SKY CONDITIONS
 WIND SPEED
25 WIND DIRECTION
 AMBIENT TEMPERATURE
85 RELATIVE HUMIDITY
65%

COMMENTS
**I COULD NOT GET FURTHER FROM THE
 STACK AND STILL KEEP THE VISUAL CONTACT
 I NEEDED WITH THE TEST CREW**

SOURCE LAYOUT SKETCH
 DRAW NORTH ARROW

 X EMISSION POINT

START TIME WITH OCCURANCE OF COKE PUSHING

	0	15	30	45		0	15	30	45
14:10	0	0	0	0	31				
2	0	0	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
14:20	0	0	0	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	0	0	0	0	38				
14:31	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				
14:45	0	0	0	0	44				
14:45	0	0	0	0	45				
16	0	0	0	0	46				
17	0	0	0	0	47				
14:57	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	X		52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR FOR HIGHEST PERIOD
 NUMBER OF READINGS ABOVE
 % WERE

RANGE OF OPACITY READINGS
 MINIMUM MAXIMUM

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS.
 SIGNATURE

TITLE DATE

OBSERVER'S SIGNATURE
Thomas A. Nazarek DATE
8-3-81
 VERIFIED BY

SOURCE NAME

WHEELING-PGH. STEEL

ADDRESS

MONESSEN

STATE

PA

ZIP

TELEPHONE

SOURCE ID NUMBER

OBSERVATION DATE

8-4-81

PROCESS

COKE OVENS

OPERATING MODE

INTERMITTENT

CONTROL EQUIPMENT

BAGHOUSE

OPERATING MODE

CONTINUOUS

DESCRIBE EMISSION POINT

STACK

HEIGHT ABOVE
GROUND LEVEL

115

HEIGHT RELATIVE
TO OBSERVER

110

DISTANCE FROM OBSERVER

250' MIN.

DIRECTION FROM OBSERVER

VARIES WITH POSITION
OF SUN AS TEST IS RUNNING
ALL DAY.

DESCRIBE EMISSIONS

NONE OBSERVABLE

EMISSION COLOR

COLORLESS

PLUME TYPE ☐ INTERMITTENT

CONTINUOUS ☐ FUGITIVE ☐

WATER DROPLETS PRESENT

NO ☒ YES ☐

IF YES, IS PLUME

ATTACHED ☐

DETACHED ☐

AT WHAT POINT WAS OPACITY DETERMINED

DIRECTLY ABOVE STACK

DESCRIBE BACKGROUND

SKY - SOME INTERFERENCE FOR SINTER STACK

BACKGROUND COLOR

HAZY BLUE/COMPOUND

SKY CONDITIONS SMOKE

VARIABLY OVERCAST

WIND SPEED

1-2 MPH

WIND DIRECTION

FROM SOUTH EAST

AMBIENT TEMPERATURE

78

RELATIVE HUMIDITY

68%

COMMENTS

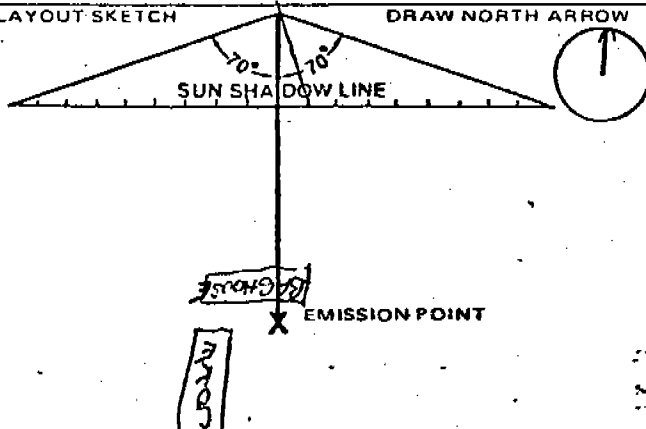
POSITION AND DISTANCE FROM STACK

RESTRICTED BY NEED TO MAINTAIN VISUAL

CONTACT W/ TEST CREW

SOURCE LAYOUT SKETCH

DRAW NORTH ARROW



OBSERVER'S SIGNATURE

Thomas A. Nazarek

DATE

8-4-81

VERIFIED BY

SOURCE NAME (PRINT)

THOMAS A. NAZAREK

ORGANIZATION

CLEAN AIR ENGINEERING, INC

IDENTIFIED BY

ETA

DATE

CONTINUES W/ COKE PUSHING

START TIME

STOP TIME

	0	15	30	45		0	15	30	45
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
30	0	0	0	0	60	0	0	0	0

AVERAGE OPACITY FOR
FOR HIGHEST PERIOD

NUMBER OF READINGS ABOVE

% WERE

RANGE OF OPACITY READINGS

MINIMUM

MAXIMUM

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS.

SIGNATURE

TITLE

DATE

FACILITY NAME WHEELING-PGM. STEEL CORP.	
ADDRESS RUN 2 8.4.81	
STATE	ZIP
TELEPHONE	
SOURCE ID NUMBER	OBSERVATION DATE
PROCESS	OPERATING MODE
CONTROL EQUIPMENT	OPERATING MODE
DESCRIBE EMISSION POINT	
HEIGHT ABOVE GROUND LEVEL	HEIGHT RELATIVE TO OBSERVER
DISTANCE FROM OBSERVER	DIRECTION FROM OBSERVER
DESCRIBE EMISSIONS	
EMISSION COLOR	PLUME TYPE ☐ INTERMITTENT ☐ CONTINUOUS ☐ FUGITIVE ☐
WATER DROPLETS PRESENT NO ☐ YES ☐	IF YES, IS PLUME ATTACHED ☐ DETACHED ☐
AT WHAT POINT WAS OPACITY DETERMINED	
DESCRIBE BACKGROUND	
BACKGROUND COLOR	SKY CONDITIONS
WIND SPEED	WIND DIRECTION
AMBIENT TEMPERATURE	RELATIVE HUMIDITY
COMMENTS	
SOURCE LAYOUT SKETCH	
DRAW NORTH ARROW	

ORGANIZATION									
CERTIFIED BY								DATE	
START TIME					STOP TIME				
	0	15	30	45		0	15	30	45
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
30	0	0	0	0	60	0	0	0	0
AVERAGE OPACITY FOR FOR HIGHEST PERIOD					NUMBER OF READINGS ABOVE % WERE				
RANGE OF OPACITY READINGS					MINIMUM MAXIMUM				
OBSERVER'S SIGNATURE					DATE				
VERIFIED BY					DATE				
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS.					SIGNATURE				
TITLE					DATE				

REPORT FORM

WHEELING-PITTSBURGH STEEL CORP.

PLANT

MONESSEN

STATE ZIP TELEPHONE

PA

SOURCE ID NUMBER

OBSERVATION DATE

8-5-81

PROCESS

COKE OVEN

OPERATING MODE

INTERMITTENT

CONTROL EQUIPMENT

BAGHOUSE

OPERATING MODE

CONTINUOUS

DESCRIBE EMISSION POINT

STACK

HEIGHT ABOVE GROUND LEVEL

115

HEIGHT RELATIVE TO OBSERVER

110

DISTANCE FROM OBSERVER

250 MIN.

DIRECTION FROM OBSERVER

S

DESCRIBE EMISSIONS

NONE VISIBLE

EMISSION COLOR

COLORLESS

PLUME TYPE ☐ INTERMITTENT

CONTINUOUS ☐ FUGITIVE ☐

WATER DROPLETS PRESENT

NO ☒

YES ☐

IF YES, IS PLUME

ATTACHED ☐

DETACHED ☐

AT WHAT POINT WAS OPACITY DETERMINED

DIRECTLY ABOVE STACK

DESCRIBE BACKGROUND

SKY

BACKGROUND COLOR

Hazy Grey

SKY CONDITIONS

OVERCAST

WIND SPEED

CALM

WIND DIRECTION

AMBIENT TEMPERATURE

78

8:29.32

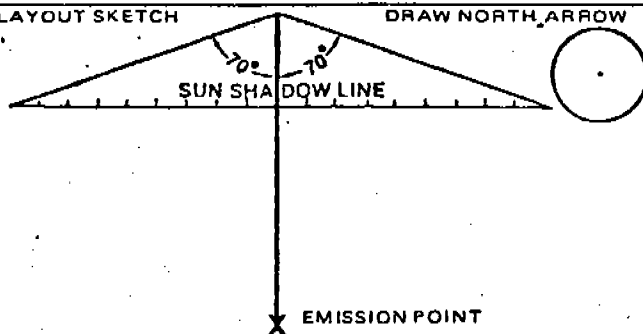
RELATIVE HUMIDITY

77%

COMMENTS

SOURCE LAYOUT SKETCH

DRAW NORTH ARROW



REPORT FORM

THOMAS A. NAZAREK

ORGANIZATION

CLEAN AIR ENG., INC.

CERTIFIED BY

ETA

DATE

CONSIDERED WITH CORE PUSHERS

START TIME

STOP TIME

	0	15	30	45		0	15	30	45
9:02	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	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		
13	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			
17	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			
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
30	0	0	0	0	60	0	0	0	0

AVERAGE OPACITY FOR FOR HIGHEST PERIOD

NUMBER OF READINGS ABOVE

% WFRE

RANGE OF OPACITY READINGS

MINIMUM

MAXIMUM

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS.

SIGNATURE

TITLE

DATE

OBSERVER'S SIGNATURE

DATE

VERIFIED BY

SOURCE NAME

WHEELING - PITTSBURGH

ADDRESS

MONESSEN

STATE

ZIP

TELEPHONE

SOURCE ID NUMBER

OBSERVATION DATE

8-5-61

PROCESS

OPERATING MODE

CONTROL EQUIPMENT

OPERATING MODE

DESCRIBE EMISSION POINT

HEIGHT ABOVE
GROUND LEVELHEIGHT RELATIVE
TO OBSERVER

DISTANCE FROM OBSERVER

DIRECTION FROM OBSERVER

DESCRIBE EMISSIONS

EMISSION COLOR

PLUME TYPE ☐ INTERMITTENT
☐ CONTINUOUS ☐ FUGITIVE ☐WATER DROPLETS PRESENT
NO ☐ YES ☐IF YES, IS PLUME
ATTACHED ☐ DETACHED ☐

AT WHAT POINT WAS OPACITY DETERMINED

DESCRIBE BACKGROUND

BACKGROUND COLOR

SKY CONDITIONS

WIND SPEED

WIND DIRECTION

AMBIENT TEMPERATURE

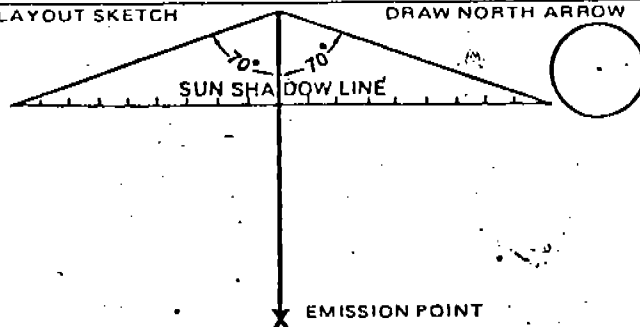
RELATIVE HUMIDITY

COMMENTS

SMOKE FROM SINTER PLANT STACK IS
FUMIGATING THE AREA

SOURCE LAYOUT SKETCH

DRAW NORTH ARROW



OBSERVER'S NAME (PRINT)

ORGANIZATION

CERTIFIED BY

DATE

START TIME

STOP TIME

	0	15	30	45		0	15	30	45
1 11:33	0	0	0	0	31	0	0		
2	0	0	0	0	32	0	0	0	0
3	0	0			33	0	0	0	0
4 13:21	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			37	0	0	0	
8 13:33	0	0	0	0	38 14:35	0	0	0	0
9	0	0	0	0	39	0	5	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41 14:42	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43 15:00	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 15:08	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48 15:17	0	0	0	0
19	0	0	0	0	49	0	0	0	0
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			54				
25 15:53	0	0	0	0	55				
26	0	0	0	0	56				
27	0	0			57				
28 14:07	0	0	0	0	58				
29	0	0	0	0	59				
30	0	0	0	0	60				

AVERAGE OPACITY FOR
FOR HIGHEST PERIODNUMBER OF READINGS ABOVE
% WERE

RANGE OF OPACITY READINGS

MINIMUM

MAXIMUM

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS.
SIGNATURE

TITLE

DATE

OBSERVER'S SIGNATURE

DATE

VERIFIED BY

COMPUTER PRINT OUT

R A W D A T A S E T # 1

1) PLANT	MONESSEN	17) HEATER BOX SETTING	250
2) LOCATION	OUTLET	18) PROBE LENGTH', ' FT.	8
3) OPERATOR	KORANDO & DOERLE	19) NOZZLE DIAMETER', ' IN.	.188
4) DATE	AUGUST 3	20) PROBE HEATER SETTING	80
5) RUN NO.	1	21) % O2	21.0
6) SAMPLE BOX NO.	12	22) % CO2	0.0
7) METER BOX NO.	I	23) ML. H2O	26
8) METER HQ	1.920	24) GM. SILICA GEL	16
9) K FACTOR	1.3	25) TOTAL	42
10) PITOT FACTOR	.84	26) START TIME	10:20AM
11) LEAK RATE BEFORE	0.00	27) FINISH TIME	3:00PM
12) LEAK RATE AFTER	.00	28) Yd.	1.0010
13) STATIC PRES., IN H2O	+1.2	29) STACK AREA	28.274
14) AMBIENT TEMPERATURE	78	30) SAMPLING TIME (MIN/PT)	1
15) BAROMETRIC PRESSURE	29.39	31) INITIAL VOLUME	591.80
16) ASSUMED MOISTURE', '%	3.5	32) FILTER & BEAKER #'S	3B
		30007F 204F 14B A4B	

Pt. #	O	VAC.	Ts	DPs	DH	Vm	Tm	IN	TmOUT	Tc	Tb	%I	
						591.80							KORANDO
0 - 0													
1 - 1	5.35	2.0	123	2.0	2.6	596.455	92	82	67	230	98.3		
1 - 2	3.83	2.0	150	2.0	2.6	599.885	96	88	67	250	103.3		
1 - 3	8.28	2.0	140	2.1	2.7	607.32	104	92	69	248	97.7		
1 - 4	4.63	2.0	141	2.1	2.7	611.54	108	99	69	249	99.3		
1 - 5	3.33	2.0	137	2.0	2.6	614.48	102	98	69	250	99.8		
1 - 6	4.00	2.0	127	2.0	2.6	618.005	98	96	67	254	98.8		
1 - 7	2.38	2.0	134	1.5	1.95	619.95	100	95	67	253	108.5		
1 - 8	7.18	2.0	120	1.45	1.86	625.34	98	95	65	253	97.2		
1 - 9	6.58	2.0	110	1.4	1.75	630.11	93	86	64	246	96.1		
1 - 10	3.05	2.0	135	1.15	1.4	632.11	94	89	64	249	100.3		
1 - 11	4.57	2.0	135	1.1	1.4	635.086	102	92	63	254	99.3		
1 - 12	2.70	2.0	119	.78	.98	636.587	98	94	64	248	102.6		
2 - 1	4.42	2.0	154	1.6	2.10	640.10	104	95	69	248	101.3		
2 - 2	3.62	2.0	156	1.7	2.25	643.04	104	97	68	250	101.0		
2 - 3	5.68	2.0	151	1.8	2.3	647.865	109	100	70	255	100.2		
2 - 4	2.78	2.0	166	1.8	2.3	650.17	105	100	69	261	101.6		
2 - 5	2.02	2.0	172	1.7	2.1	651.84	105	100	68	260	106.3		

74.4		137	1.292	2.17	60.04	97							
TOTAL		AVG.	ROOT	AVG.	VOLUME	AVG.							

RAW DATA SET # 2

1) PLANT	MONESSEN	17) HEATER BOX SETTING	250
2) LOCATION	OUTLET	18) PROBE LENGTH', ' FT.	6
3) OPERATOR	DOERLE	19) NOZZLE DIAMETER', 'IN.	.188
4) DATE	AUGUST 4	20) PROBE HEATER SETTING	80
5) RUN No.	2	21) % O2	21.0
6) SAMPLE BOX No.	12	22) % CO2	0.0
7) METER BOX No.	I	23) ML. H2O	32
8) METER HQ	1.920	24) GM. SILICA GEL	28
9) K FACTOR	1.3	25) TOTAL	60
10) PITOT FACTOR	.84	26) START TIME	8:25AM
11) LEAK RATE BEFORE	0.00	27) FINISH TIME	4:12PM
12) LEAK RATE AFTER	.00	28) YD.	1.0010
13) STATIC PRES., IN H2O	-1.1	29) STACK AREA	28.27
14) AMBIENT TEMPERATURE	77	30) SAMPLING TIME (MIN/PT)	1
15) BAROMETRIC PRESSURE	29.40	31) INITIAL VOLUME	52.15
16) ASSUMED MOISTURE', '%	3.5	32) FILTER & BEAKER #'S	23B
		30010F 203F 22B 10B	

PT. #	Ø	VAC.	Ts	DPs	DH	Vm	Tm	IN	TmOUT	Tc	Tb	XI
0 - 0						52.15						DOERLE
1 - 1	8.40	2	111	2.2	3	59.84	88	75	66	250	98.1	
1 - 2	7.37	2	124	2.1	2.8	66.43	94	80	66	254	98.4	
1 - 3	7.33	2	121	2.3	3	72.73	97	84	64	250	89.7	
- 4	2.5	2	142	2.2	2.9	75.54	97	88	67	252	123.9	*
- 5	3.17	2	139	2.2	2.9	78.52	100	91	69	255	102.7	
1 - 6	2.95	2	129	2.2	2.9	81.19	102	85	64	251	98.8	
1 - 7	3.62	2	146	2	2.6	84.37	103	96	66	251	100.2	
1 - 8	2.95	2	152	1.5	2	86.48	98	95	66	254	96.6	
1 - 9	7.52	2	147	1.5	2	92.31	98	93	68	251	101.3	
1 - 10	4.43	2	145	1.2	1.6	95.40	95	91	64	250	103.7	
1 - 11	3.83	2	143	1.2	1.6	98.06	92	90	67	247	103.9	
1 - 12	7.00	1	123	.95	1.2	102.91	96	90	69	253	112.2	
2 - 1	5.63	2	151	2	2.6	107.85	98	91	70	241	100.3	
2 - 2	7.33	2	139	2	2.6	114.26	91	86	64	238	99.6	
2 - 3	4.07	2	151	2.1	2.7	117.87	93	85	65	254	100.7	
2 - 4	3.12	2	156	1.9	2.5	120.56	93	87	67	249	104.0	
2 - 5	7.73	2	161	2.1	2.6	127.38	95	88	63	247	99.2	
2 - 6	3.05	2	166	1.8	2.3	129.90	94	89	65	246	103.2	
2 - 7	3.50	2	165	1.9	2.4	132.86	95	89	65	245	102.1	
2 - 8	4.87	2	161	1.7	2.1	136.73	97	90	64	254	99.9	
2 - 9	3.57	2	167	1.7	2.1	139.61	96	90	66	252	102.9	
2 - 10	3.07	2	163	1.4	1.8	141.15	97	91	66	249	72.3	*
2 - 11	4.42	2	131	1.3	1.6	144.24	97	91	62	254	98.5	
LEAK CH	0	0	0	0	0	145.98						
2 - 12	3.33	2	139	1.3	1.6	148.22	97	92	67	253	96.5	

	114.76		142	1.333	2.34	94.33		92				
TOTAL			AVG.	ROOT	AVG.	VOLUME		AVG.				

RAW DATA SET # 3

1) PLANT	MONESSEN	17) HEATER BOX SETTING	70
2) LOCATION	OUTLET	18) PROBE LENGTH', ' FT.	6
3) OPERATOR	DOERLE	19) NOZZLE DIAMETER', 'IN.	.188
4) DATE	AUGUST 5	20) PROBE HEATER SETTING	80
5) RUN NO.	3	21) % O2	21.0
6) SAMPLE BOX NO.	7	22) % CO2	0.0
7) METER BOX NO.	I	23) ML. H2O	22
8) METER HQ	1.920	24) GM. SILICA GEL	18
9) K FACTOR	1.3	25) TOTAL	40
10) PITOT FACTOR	.84	26) START TIME	8:15 AM
11) LEAK RATE BEFORE	006	27) FINISH TIME	3:52 PM
12) LEAK RATE AFTER	006	28) YD.	1.0010
13) STATIC PRES., IN H2O	-1.1	29) STACK AREA	28.28
14) AMBIENT TEMPERATURE	75	30) SAMPLING TIME (MIN/PT)	1
15) BAROMETRIC PRESSURE	29.32	31) INITIAL VOLUME	48.41
16) ASSUMED MOISTURE', '%	3.5	32) FILTER & BEAKER #'S	307B
			3000BF 202F B2B A6B

PT. #	Ø	VAC.	Ts	DPs	DH	Vm	Tm	IN	TmOUT	Tc	Tb	%I
0 - 0						48.41						DOERLE
1 - 1	2.3	4	133	2	2.6	50.42	97	81	63	269	100.5	
1 - 2	3.25	3	138	2.1	2.7	53.21	93	84	64	254	96.0	
1 - 3	3.33	3	134	2.3	3	56.18	97	89	64	250	94.2	
- 4	2.87	3	141	2.1	2.7	58.74	94	89	66	255	99.7	
- 5	4.55	3	148	2.3	3	60.02	97	90	67	254	31.2	*
1 - 6	2.48	3	147	2.1	2.7	65.25	94	90	68	248	232.9	*
1 - 7	6.48	2	124	1.6	2.1	70.41	90	85	62	257	99.8	
1 - 8	2.62	2	128	1.5	2	72.41	92	86	63	253	100.8	
1 - 9	2.78	2	135	1.3	1.7	74.44	93	87	64	240	103.9	
1 - 10	3.52	2	136	1.3	1.7	76.95	94	89	66	246	100.7	
1 - 11	3.18	2	132	1.1	1.4	79.05	93	90	66	259	101.4	
1 - 12	2.67	1	113	.86	1.1	80.57	93	90	67	241	98.4	
2 - 1	2.97	2	146	1.8	2.3	83.03	94	89	68	249	100.4	
2 - 2	2.42	2	158	1.9	2.5	85.13	94	89	70	240	103.9	
LEAK CH						85.22						
2 - 3	3.68	3	124	1.8	2.3	88.24	94	88	62	257	97.3	
2 - 4	7.93	3	140	1.8	2.3	94.85	93	88	64	255	99.0	
2 - 5	2.23	3	146	1.8	2.3	96.74	92	88	66	254	103.8	
2 - 6	3.25	3	157	1.9	2.5	99.54	95	89	68	257	102.2	
2 - 7	2.7	2	150	1.6	2	101.64	94	89	66	255	100.7	
2 - 8	2.58	3	165	2	2.5	103.86	92	89	65	251	101.0	
2 - 9	1.92	3	150	2	2.5	105.38	92	88	64	260	93.2	
2 - 10	2.22	2	143	1.7	2.2	107.26	91	89	66	258	106.5	
2 - 11	2.12	2	140	1.6	2.1	108.93	91	89	66	247	102.3	
2 - 12	2.22	2	129	1.5	2	110.64	91	87	67	255	102.4	
76.27			139	1.318	2.27	62.14		91				
TOTAL			AVG.	Root	AVG.	VOLUME		AVG.				

WEIGH SHEET # 1

R D S	R U N	W T #	IDENTIFIER	F B T	WASH ML	CORR.	GROSS	TARE	NET

		1	BLANK	B	150	0.0000	104.9393	104.9389	.0004
01	1	2	3	B	200	.0005	101.9513	101.9274	.0234
02	2	3	23	B	250	.0007	105.6180	105.5921	.0252
03	3	4	307	B	250	.0007	110.6865	110.6703	.0155
03	3	5	30008	F	----	-----	.5509	.5548	-.0039
01	1	6	30007	F	----	-----	.5566	.5579	-.0013
02	2	7	30010	F	----	-----	.5509	.5533	-.0024
01	1	8	204	F	----	-----	.1000	.0990	.0010
02	2	9	203	F	----	-----	.1018	.1014	.0004
03	3	10	202	F	----	-----	.1006	.0996	.0010
		11	Z	-	----	-----	-----	-----	-----
		12	*	-	----	-----	-----	-----	-----
		13	*	-	----	-----	-----	-----	-----
		14	*	-	----	-----	-----	-----	-----
		15	*	-	----	-----	-----	-----	-----
		16	*	-	----	-----	-----	-----	-----
		17	*	-	----	-----	-----	-----	-----
		18	*	-	----	-----	-----	-----	-----
		19	*	-	----	-----	-----	-----	-----
		20	*	-	----	-----	-----	-----	-----

WEIGH SHEET # 2

R D S	R U N	W T #	IDENTIFIER	F B T	WASH ML	CORR.	GROSS	TARE	NET

		1	BLANK	B	150	0.0000	92.9358	92.9358	.0000
02	2	2	22	B	200	.0000	107.5928	107.5784	.0144
01	1	3	14	B	75	.0000	102.3520	102.3473	.0047
03	3	4	B2	B	150	.0000	97.5735	97.5595	.0140
01	1	5	A4	B	0000	.0000	94.2972	94.2233	.0739
02	2	6	10	B	0000	.0000	101.3095	101.2608	.0487
03	3	7	A6	B	0000	.0000	96.0032	95.9935	.0097
		8	END	-	-----	-----	-----	-----	-----
		9	-----	-	-----	-----	-----	-----	-----
		10	-----	-	-----	-----	-----	-----	-----
		11	-----	-	-----	-----	-----	-----	-----
		12	-----	-	-----	-----	-----	-----	-----
		13	-----	-	-----	-----	-----	-----	-----
		14	-----	-	-----	-----	-----	-----	-----
		15	-----	-	-----	-----	-----	-----	-----
		16	-----	-	-----	-----	-----	-----	-----
		17	-----	-	-----	-----	-----	-----	-----
		18	-----	-	-----	-----	-----	-----	-----
		19	-----	-	-----	-----	-----	-----	-----
		20	-----	-	-----	-----	-----	-----	-----



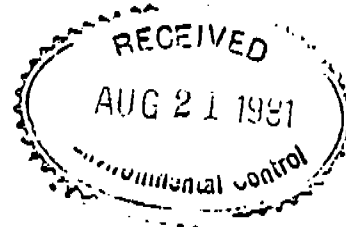
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

ENVIRONMENTAL PROTECTION
Bureau of Air Quality Control
Armbrust Professional Center
R. D. #2, Box 603-C
Greensburg, Pennsylvania 15601



412-925-8115
412-925-1310

August 17, 1981



Dr. D. R. Samples
Environmental Control
Wheeling-Pittsburgh
Duvall Center
Wheeling, WV 26003

Dear Dr. Samples:

Enclosed is a copy of pusher observations taken on August 4, 1981 and August 5, 1981 during the minister stein stack test. That equipment looked great.

After Harrisburg reviews the results of the stack test and if found to be favorable, this office will abate that portion of the consent agreement.

Sincerely,

A handwritten signature in cursive script, likely of Richard Thomas.

Richard Thomas
Air Quality Specialist

RT:amg

Enclosures

cc: A & C
Pgh. Reg. Office
T. File

APPENDIX A (CONT.)

DATE: 8/5/61

Richard Thomas
OBSERVER SIGNATURE

REPRESENTING

COMPANY () DER (A)

Position of Observer:

* Each Push lasts 30 to 45 seconds

PUSHING

BY-PRODUCT COKE OVENS RECORD OF VISIBLE EMISSIONS OBSERVATIONS

APPENDIX A (CONTD)

COMPANY: W-P

PLANT: MONESSON

BATTERY: #1, #2

DATE: 8/4/81

Richard Thomas
OBSERVER SIGNATURE

REPRESENTING
COMPANY () DER X

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS TIME OCCURRED
B-27	2:12*	0	0	0	2:22
C-27	2:19*	0	0	0	2:37
B-29	2:45*	0	0	0	2:50

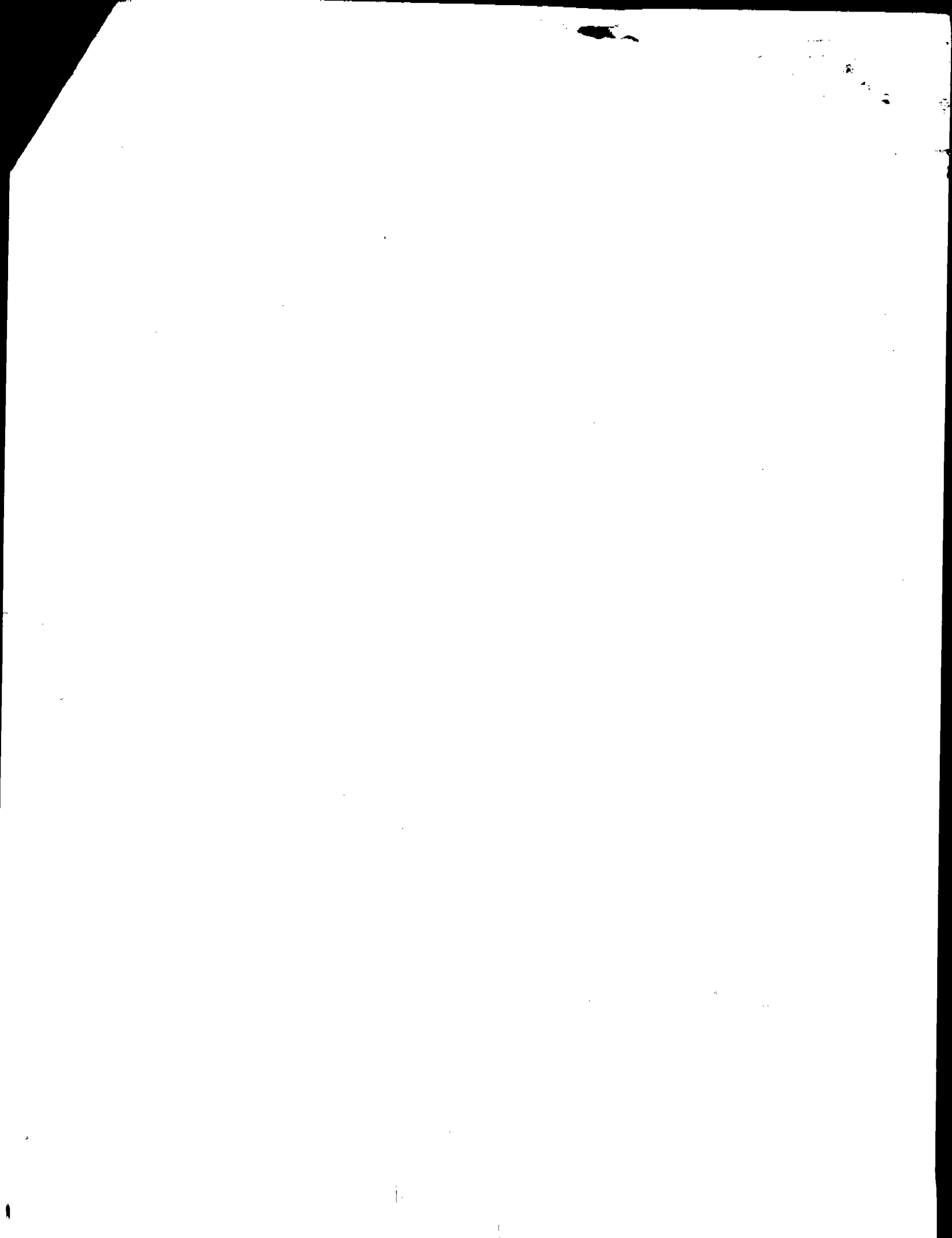
PUSHING
BY-PRODUCT COKE OVENS
RECORD OF VISIBLE
EMISSIONS OBSERVATIONS

APPENDIX A (CONTD)

COMPANY: W-P
PLANT: MONÉSSON
BATTERY: #1, #2

DATE: 8/4/81
Richard Thomas
OBSERVER SIGNATURE
REPRESENTING
COMPANY () DER (X)

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS
					<i>Time Quenched</i>
B-11	9:09*	○	○	○	9:13
C-14	9:27*	○	○	○	9:31
B-13	10:31*	○	○	○	10:35
C-13	10:44*	○	○	○	10:47
B-15	10:55*	○	○	○	10:58
C-15	11:09*	○	○	○	11:15
B-17	11:24*	○	○	○	11:20
C-17	11:40*	○	○	○	11:45
B-19	11:56*	○	○	○	12:00
C-19	12:09*	○			
B-21	1:01*				
C-21	1:15*				
B-22					



APPENDIX A

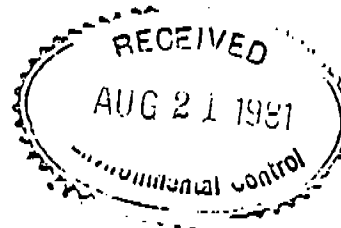
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

ENVIRONMENTAL PROTECTION
Bureau of Air Quality Control
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R. D. #2, Box 603-C
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412-925-8115
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Richard Thomas
Air Quality Specialist

RT:amg

Enclosures

cc: A & C
Pgh. Reg. Office
T. File

PUSHING

BY-PRODUCT COKE OVENS
RECORD OF VISIBLE
EMISSIONS OBSERVATIONS

COMPANY:

W-D

DATE:

8/5/81

PLANT:

WONESSON

OBSERVER SIGNATURE

REPRESENTING

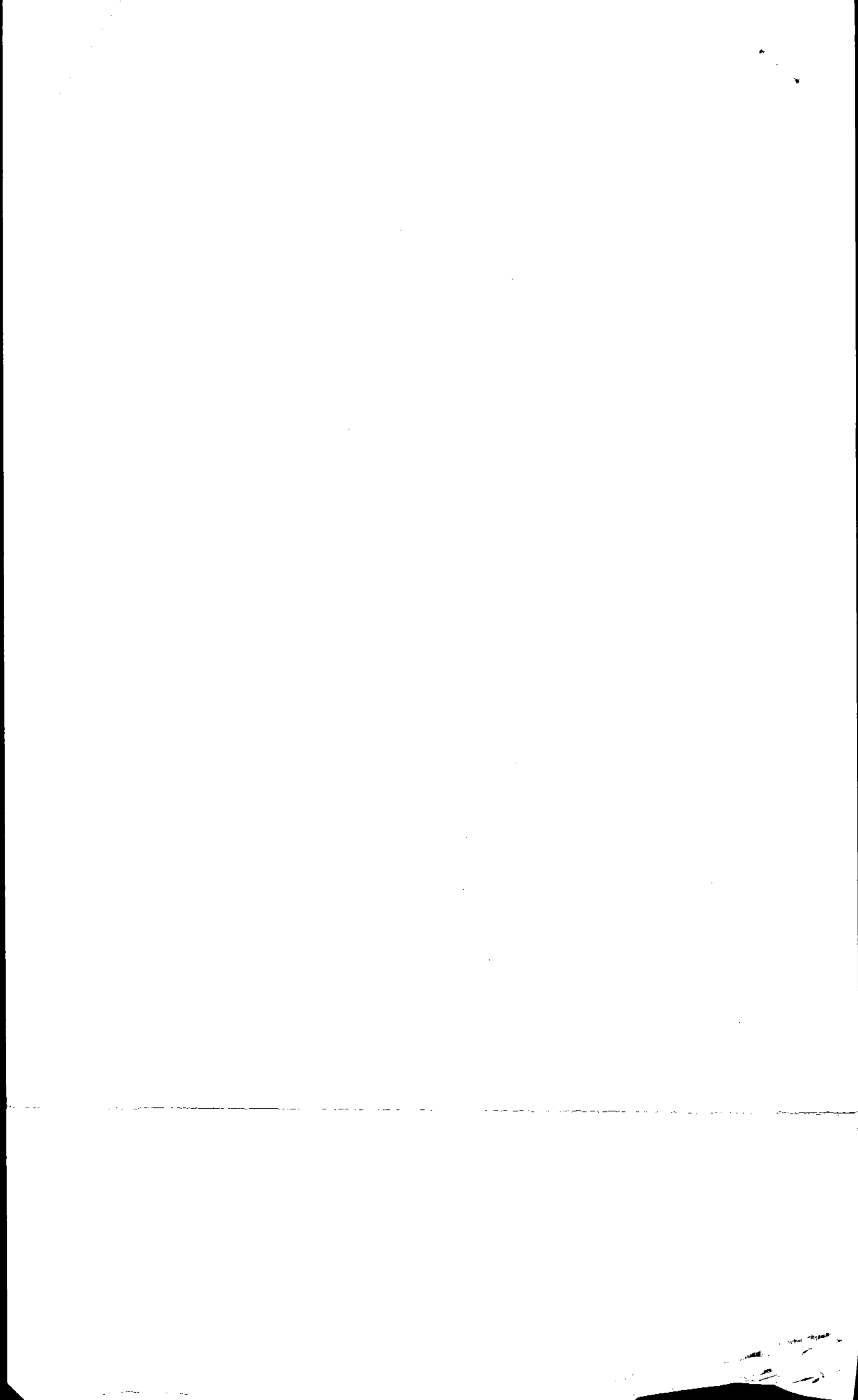
COMPANY ()

DER (X)

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS TIME OBTAINED
C-14	2:35 *	0	0	0	2:41
B-16	2:45 *	0	0	0	2:51
B-16	3:06 *	0	0	0	3:06
B-18	3:08 *	0	0	0	3:14

* Each Push lasts 30 to 45 seconds

Position of Observer:



PUSHING

BY-PRODUCT COKE OVENS
RECORD OF VISIBLE
EMISSIONS OBSERVATIONSCOMPANY: W-PPLANT: MONESSONBATTERY: #1, #2DATE: 8/5/81

OBSERVER SIGNATURE

REPRESENTING

COMPANY ()

DER (X)

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS TIME QUENCHED
B-27	9:09*	0	0	0	9:12
C-27	9:24*	0	0	0	9:22
B-29	9:25*	0	0	0	9:38
B-2	10:24*	0	0	0	10:20
C-2	10:44*	0	0	0	10:46
B-4	10:55*	0	0	0	10:58
C-4	11:03*	0	0	0	11:04
B-6	11:20*	0	0	0	11:27
C-6	11:34*	0	0	0	11:36
B-8	11:45*	0	0	0	11:48
C-8	11:55*	0	0	0	11:58
B-10	1:21*	0	0	0	1:25
C-10	1:46*	0	0	0	1:52
B-12	1:58*	0	0	0	2:02
C-12	2:08*	0	0	0	2:14
B-14	2:24*	0	0	0	2:31

* Each Push lasts 30 to 45 seconds

Position of Observer:

PUSHING

BY-PRODUCT COKE OVENS
RECORD OF VISIBLE
EMISSIONS OBSERVATIONS

APPENDIX A (CONTD)

COMPANY: W-P

PLANT: MONESSON

BATTERY: #1, #2

DATE: 8/4/81

Richard Thomas
OBSERVER SIGNATURE

REPRESENTING
COMPANY () DER X

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS TIME OCCURRED
B-27	2:12*	0	0	0	2:22
C-27	2:19*	0	0	0	2:37
B-29	2:45*	0	0	0	2:50

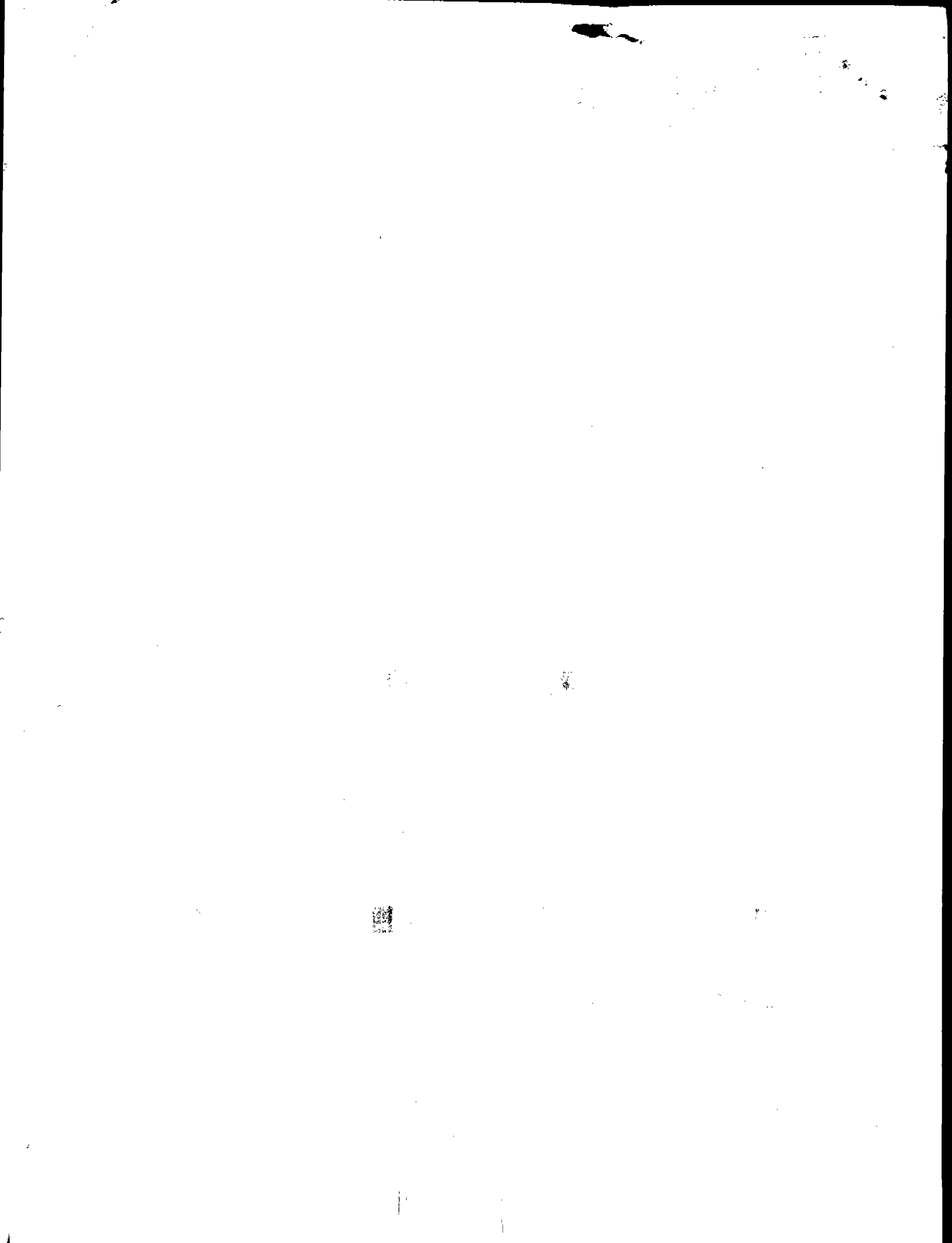
PUSHING
BY-PRODUCT COKE OVENS
RECORD OF VISIBLE
EMISSIONS OBSERVATIONS

APPENDIX A (CONTD)

COMPANY: W-P
PLANT: MONTESSON
BATTERY: #1, #2

DATE: 8/4/81
Richard Thomas
OBSERVER SIGNATURE
REPRESENTING
COMPANY () DER (X)

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS <i>Time Quenched</i>
B-11	9:09*	○	○	○	9:13
C-11	9:27*	○	○	○	9:31
B-13	10:31*	○	○	○	10:35
C-13	10:44*	○	○	○	10:47
B-15	10:55*	○	○	○	10:58
C-15	11:09*	○	○	○	11:15
B-17	11:24*	○	○	○	11:20
C-17	11:40*	○	○	○	11:45
B-19	11:56*	○	○	○	12:00
C-19	12:09*	○			
B-21	1:01*				
C-21	1:15*				
B-22					



PUSHING

BY-PRODUCT COKE OVENS

RECORD OF VISIBLE

EMISSIONS OBSERVATIONS

APPENDIX A (CONTD)

COMPANY: W-P

PLANT: MONTESSON

BATTERY: #1, #2

DATE: 8/4/81

Richard Thomas

OBSERVER SIGNATURE

REPRESENTING

COMPANY () DER (X)

OVEN NUMBER	RAM MOVE START	SECONDS VISIBLE EMISSIONS > 20% BEFORE TRANSPORT	SECONDS VISIBLE EMISSION > 10% DURING TRANSPORT	MAXIMUM OPACITY RAM/TRAN	REMARKS <i>Time Quenched</i>
B-11	9:09*	○	○	○	9:13
C-14	9:27*	○	○	○	9:31
B-13	10:31*	○	○	○	10:35
C-13	10:44*	○	○	○	10:47
B-15	10:55*	○	○	○	10:58
C-15	11:09*	○	○	○	11:15
B-17	11:24*	○	○	○	11:20
C-17	11:40*	○	○	○	11:45
B-19	11:56*	○	○	○	12:00
C-19	12:09*	○	○	○	12:15
B-21	1:01*	○	○	○	1:08
C-21	1:15*	○	○	○	1:20
B-23	1:27*	○	○	○	1:31
C-23	1:40*	○	○	○	1:45
B-25	1:55*	○	○	○	2:02
C-25	2:01*	○	○	○	2:07

* Each Push lasts 30 to 45 seconds

Position of Observer:

