

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.



Shenango
INCORPORATED

52

~~GTZ~~ → JDG

~~C.J. Goffe~~

672

16 Jan 1990

PLANTS
NEVILLE ISLAND PA
SHARPSVILLE PA
COKE OVENS
NEVILLE ISLAND PA

January 5, 1990

Allegheny County Health Department
Bureau of Air Pollution Control
301 - 39th Street
Pittsburgh, Pa. 15201

Attention: Mr. Ronald J. Chleboski
Deputy Director

Subject: #1 Coke Oven Battery
Stack Test

JDG,
I have reviewed this
report.
While the numbers look
good, do you think they are
accurate?

GTZ

Dear Mr. Chleboski:

As detailed in our correspondence dated November 13, 1989, Shenango Incorporated conducted a re-evaluation of the particulate emissions from the #1 coke oven battery combustion stack. The test, which was conducted on December 5-6, 1989 by BCM Engineers, Inc. was witnessed by Bureau personnel and utilized the protocol previously submitted by Shenango. The report, titled "Particulate Evaluation of Coke Oven Battery No. 1 Combustion Stack at Shenango Incorporated Neville Island Plant", is attached for your review.

The following particulate concentrations were measured during the test runs: 0.0040, 0.0060 and 0.0031 gr/dscf. The three runs averaged 0.0044 gr/dscf which is in compliance with the mass emission limitations of 0.015 gr/dscf.

The opacities monitored during the test runs averaged 1.8%, 0.9% and 0.9%. As a result the test results were also in compliance with the opacity limitations.

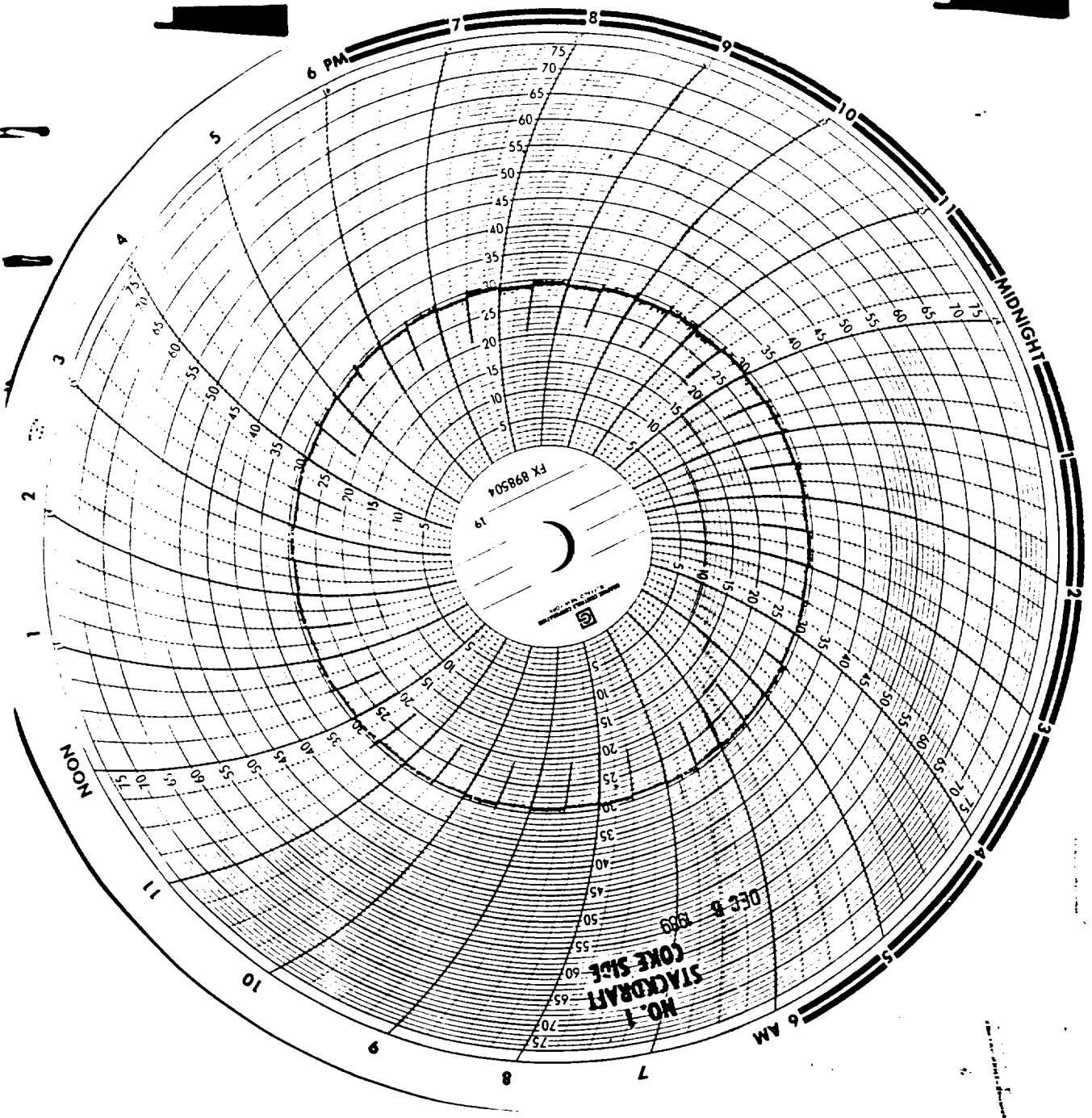
Should you have any questions following your review of the attached report, please contact me at 777-6655.

Very truly yours,



Nicholas S. Buchko
Environmental Compliance Engineer

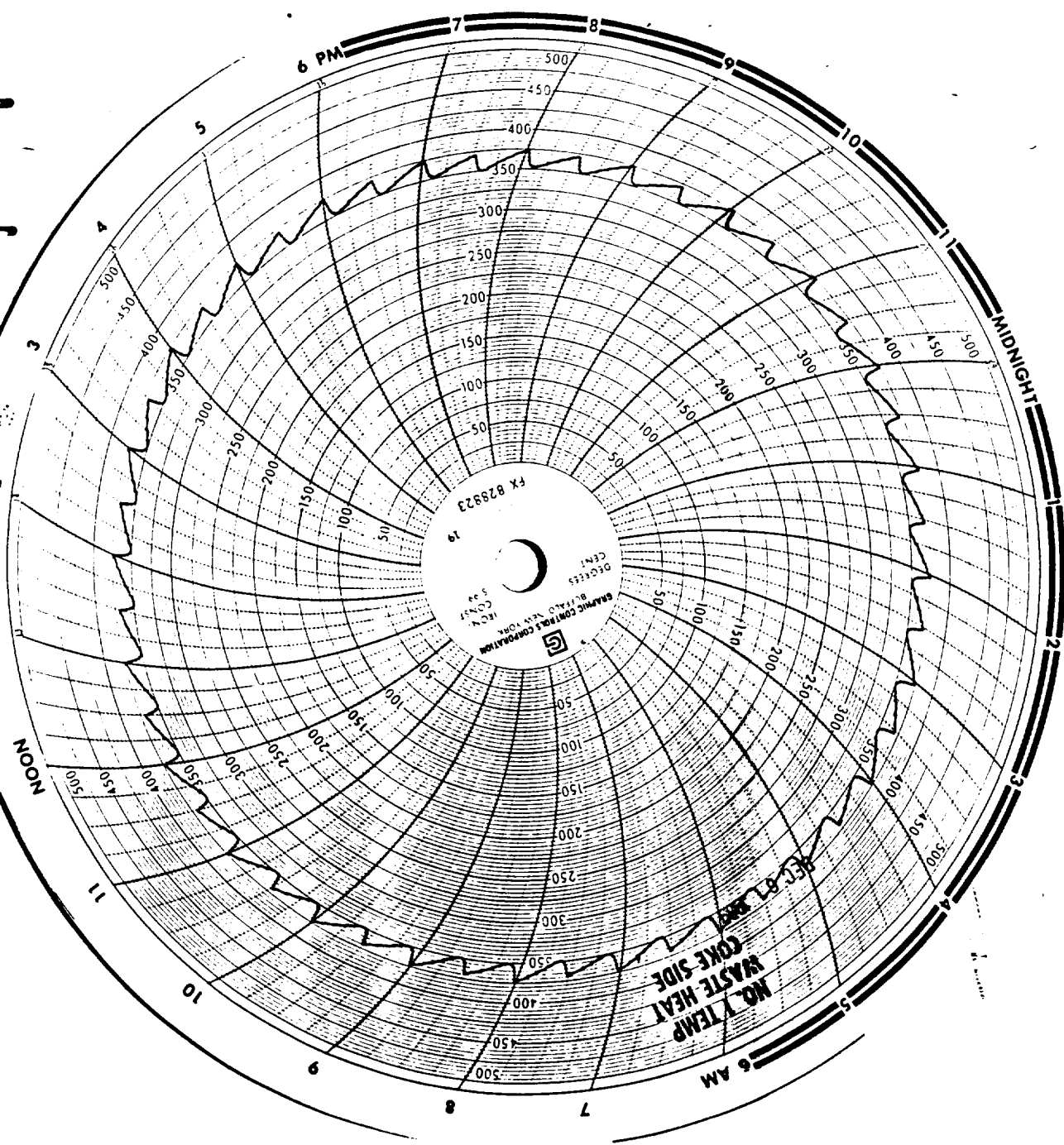
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G Owens
J McEwen
B Erhardt
V Pendergast
P Belculfine
R Cusano - Letter only
File

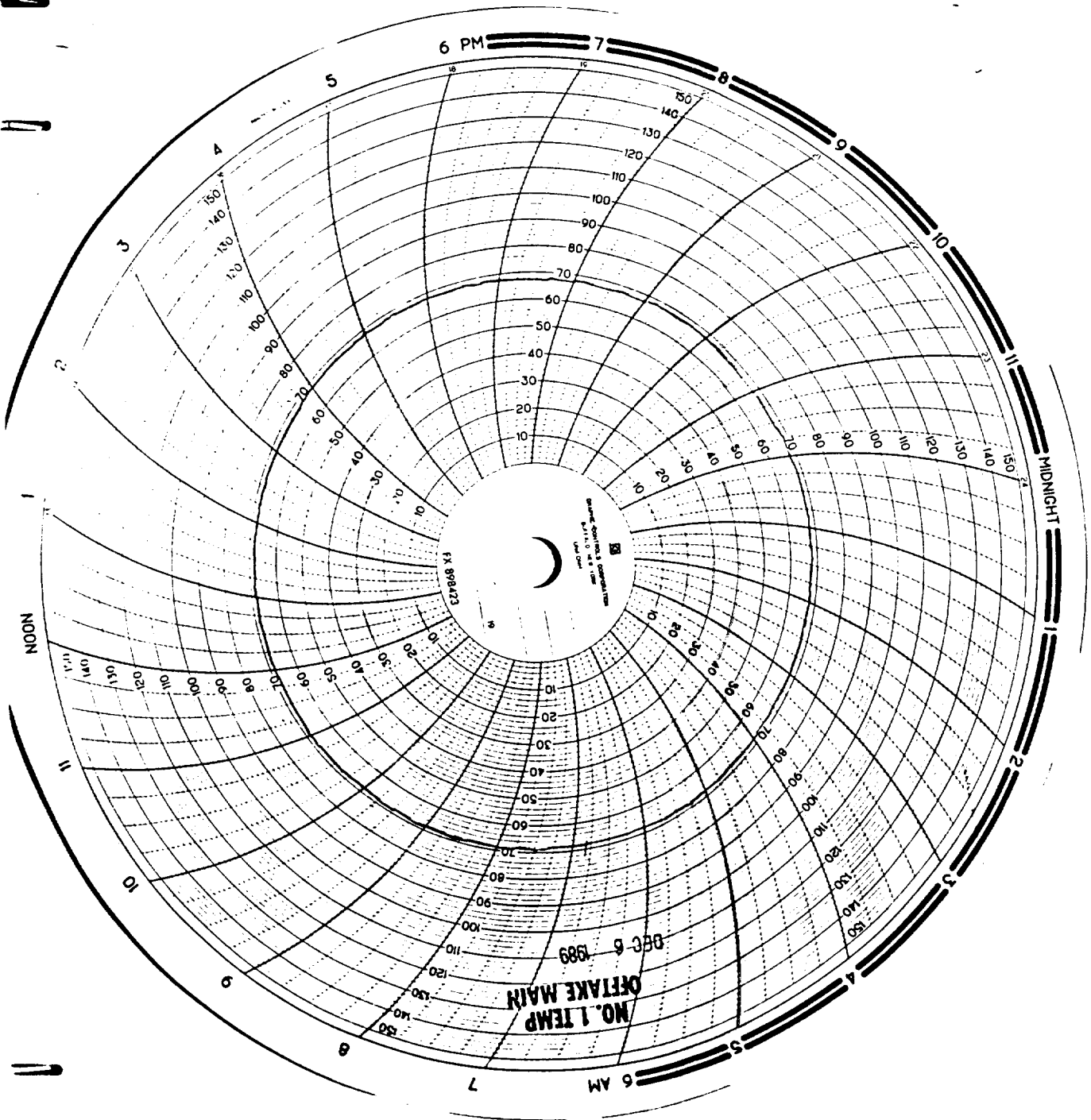


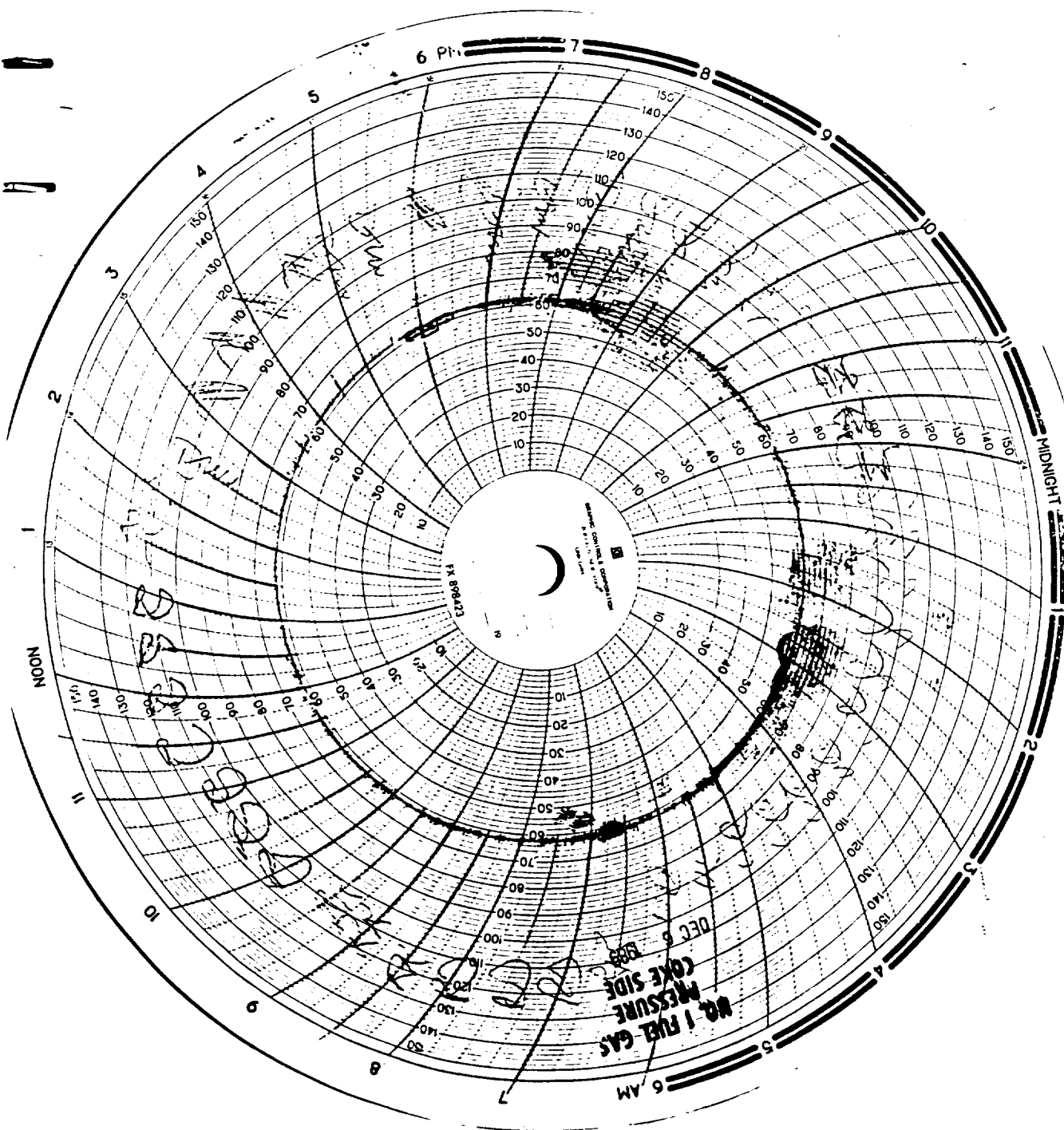
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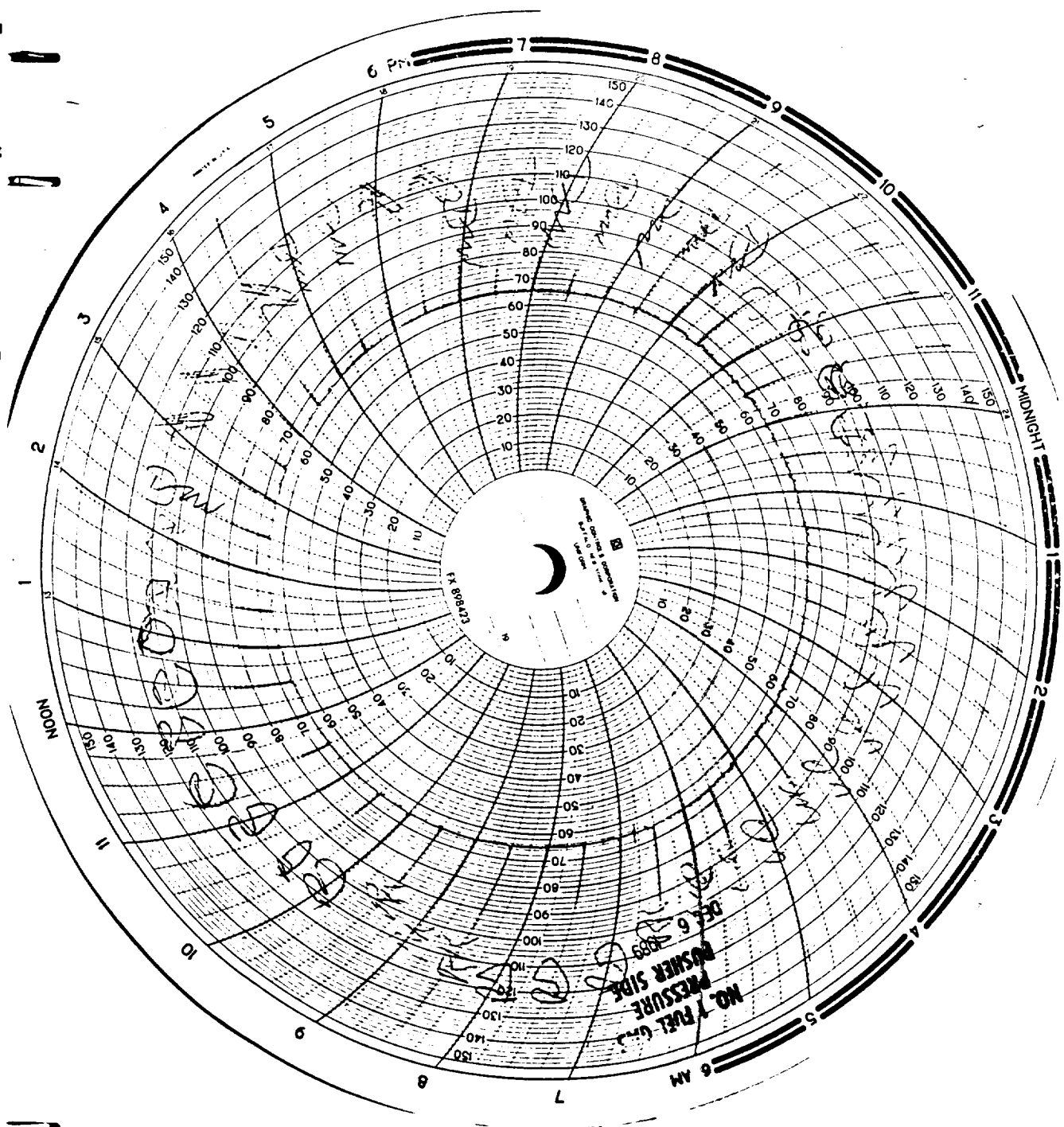


NO. 1
STACKDRAFT
COKE SILE
DEC 8 1989

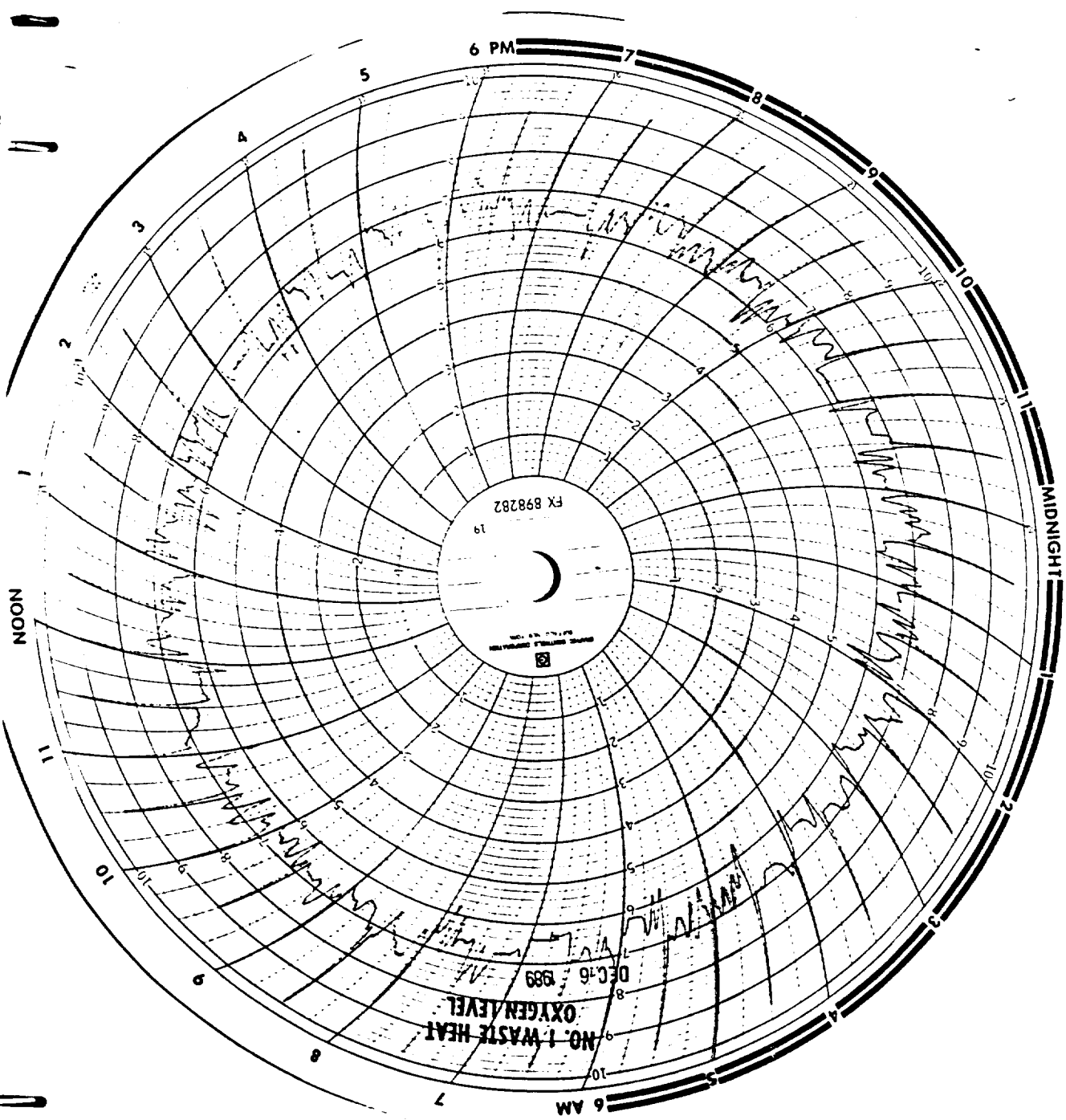








NO. 7 FUEL LINE
PRESSURE SIDE
DEF 6 3889

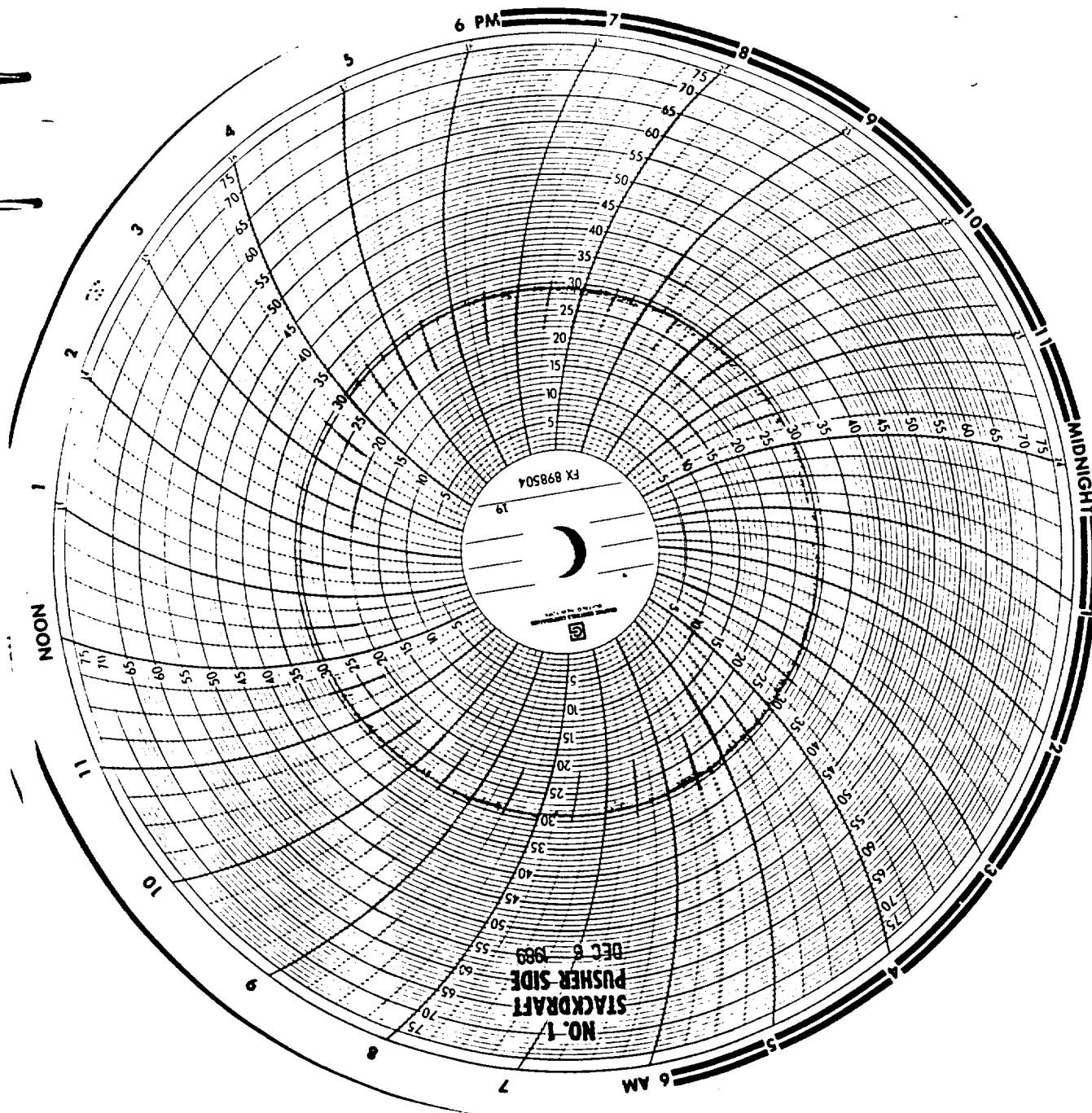


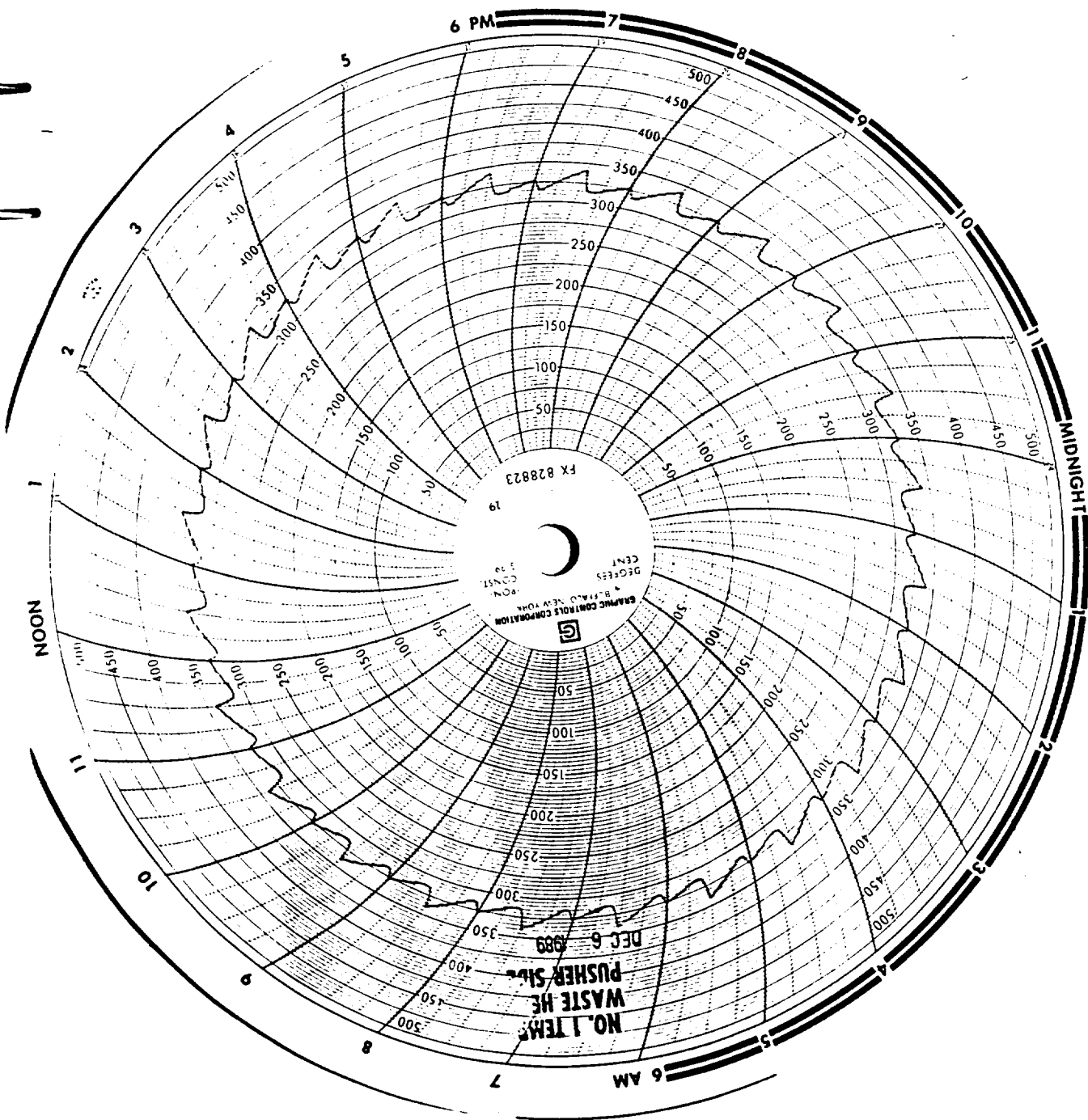
NO. 1 WASTE HEAT
OXYGEN LEVEL

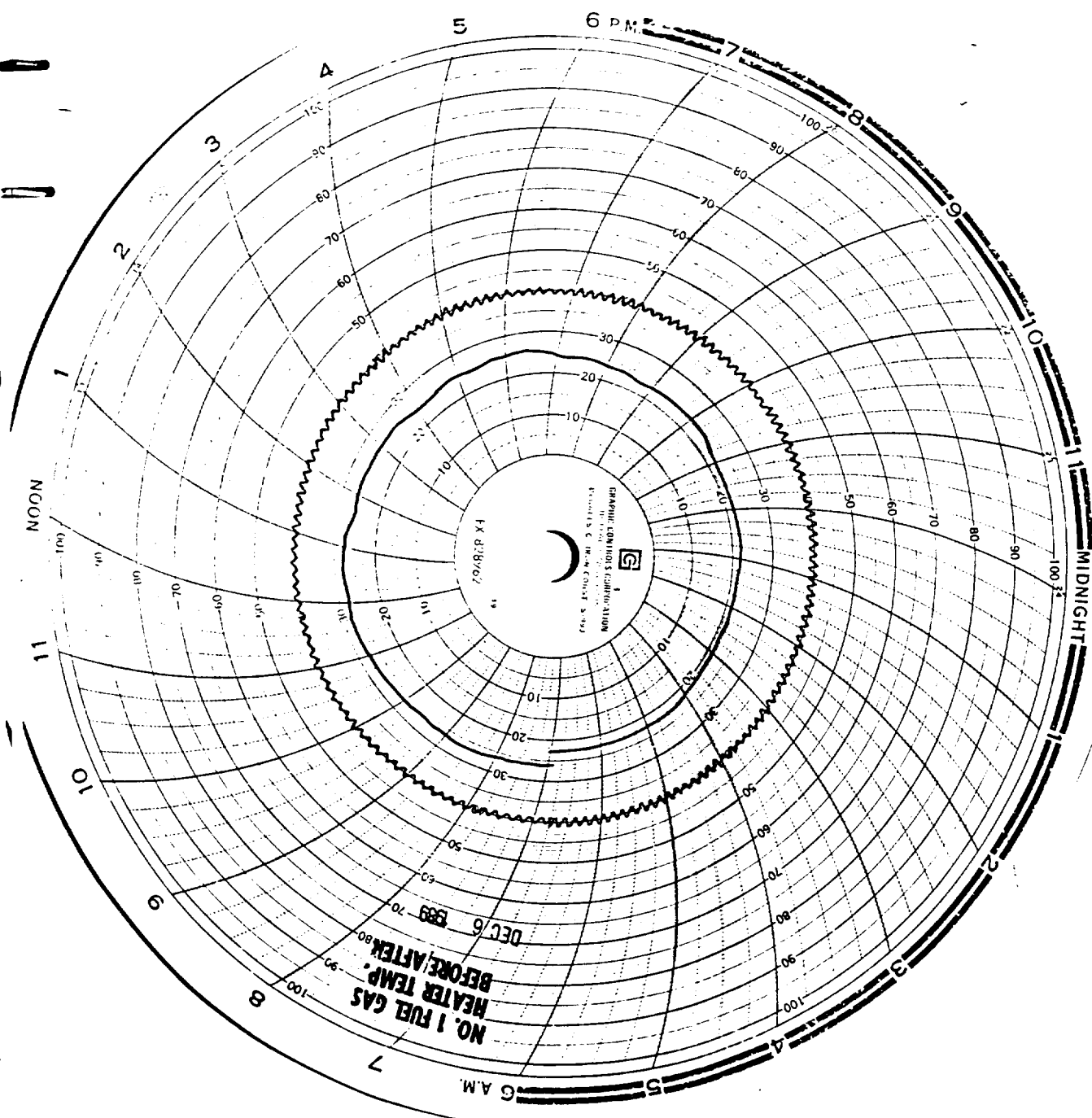
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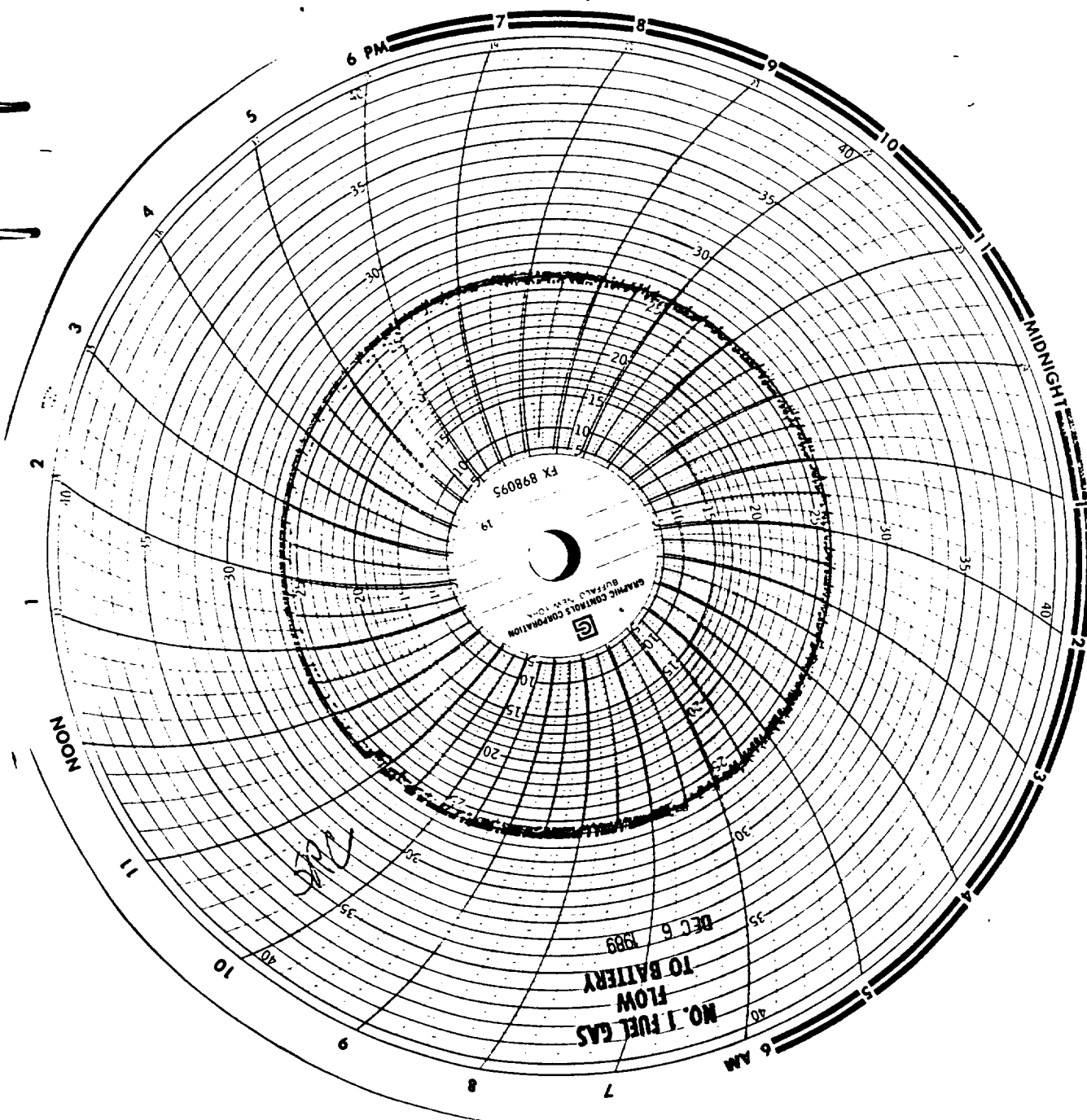
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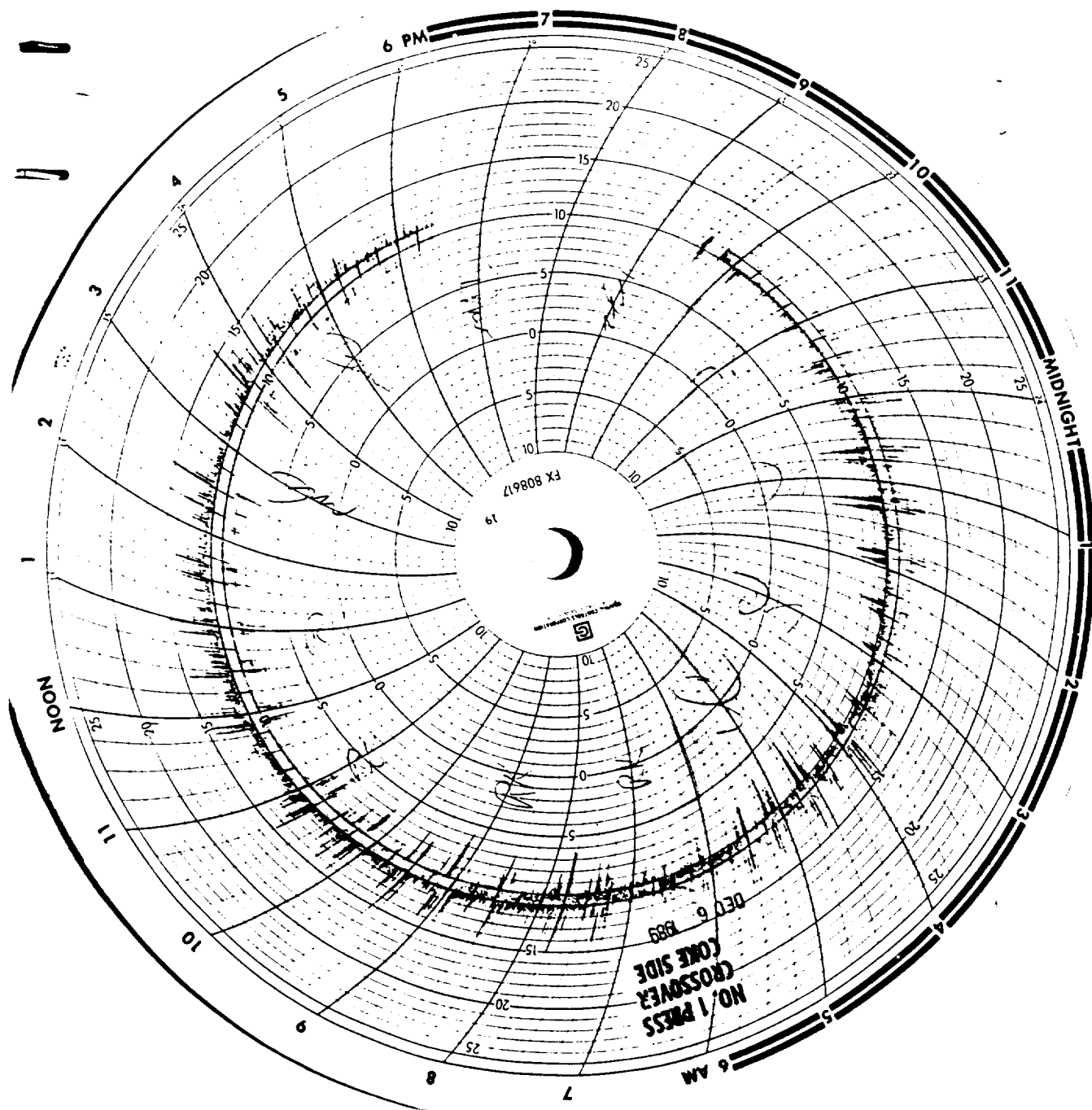
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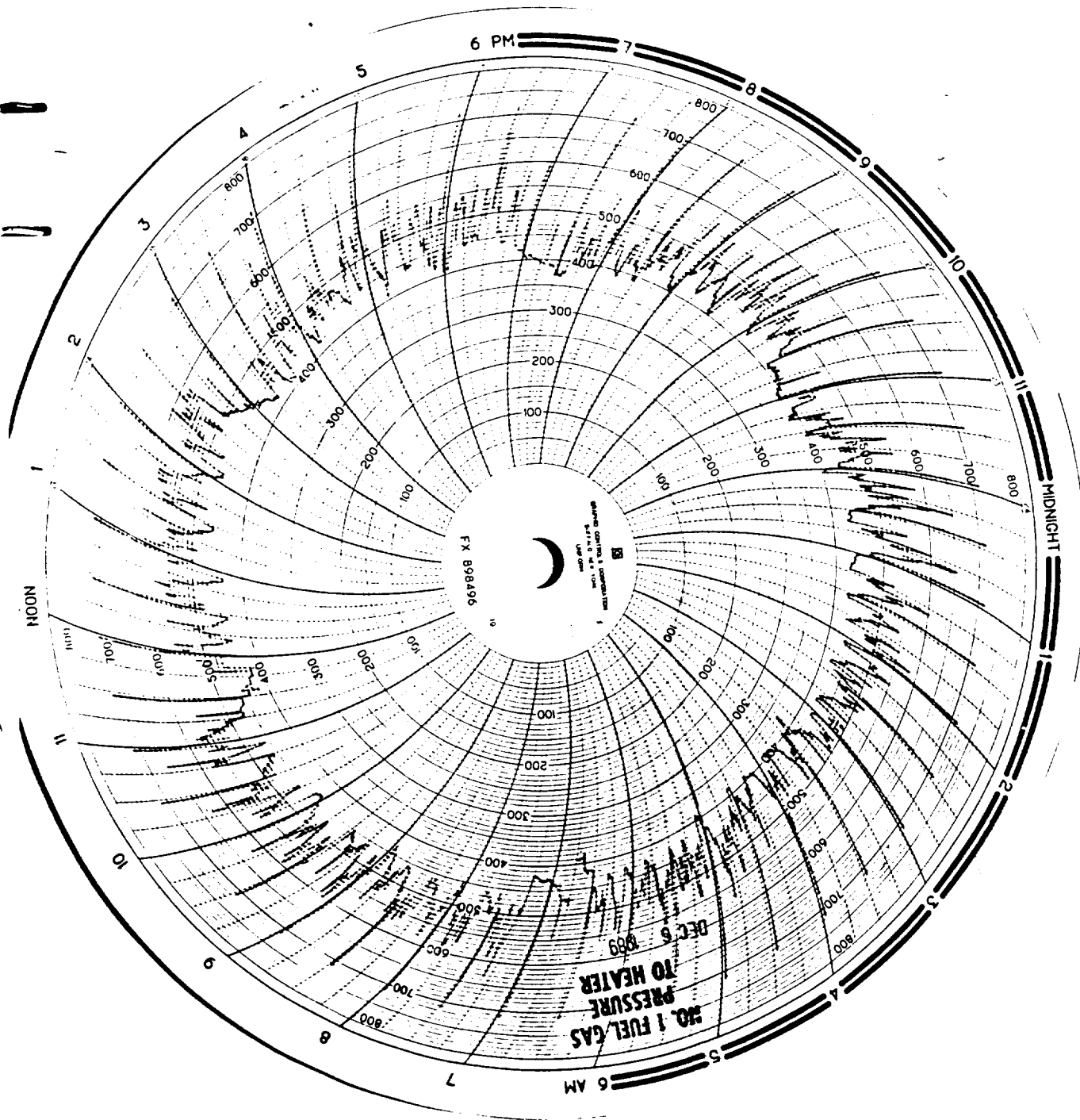


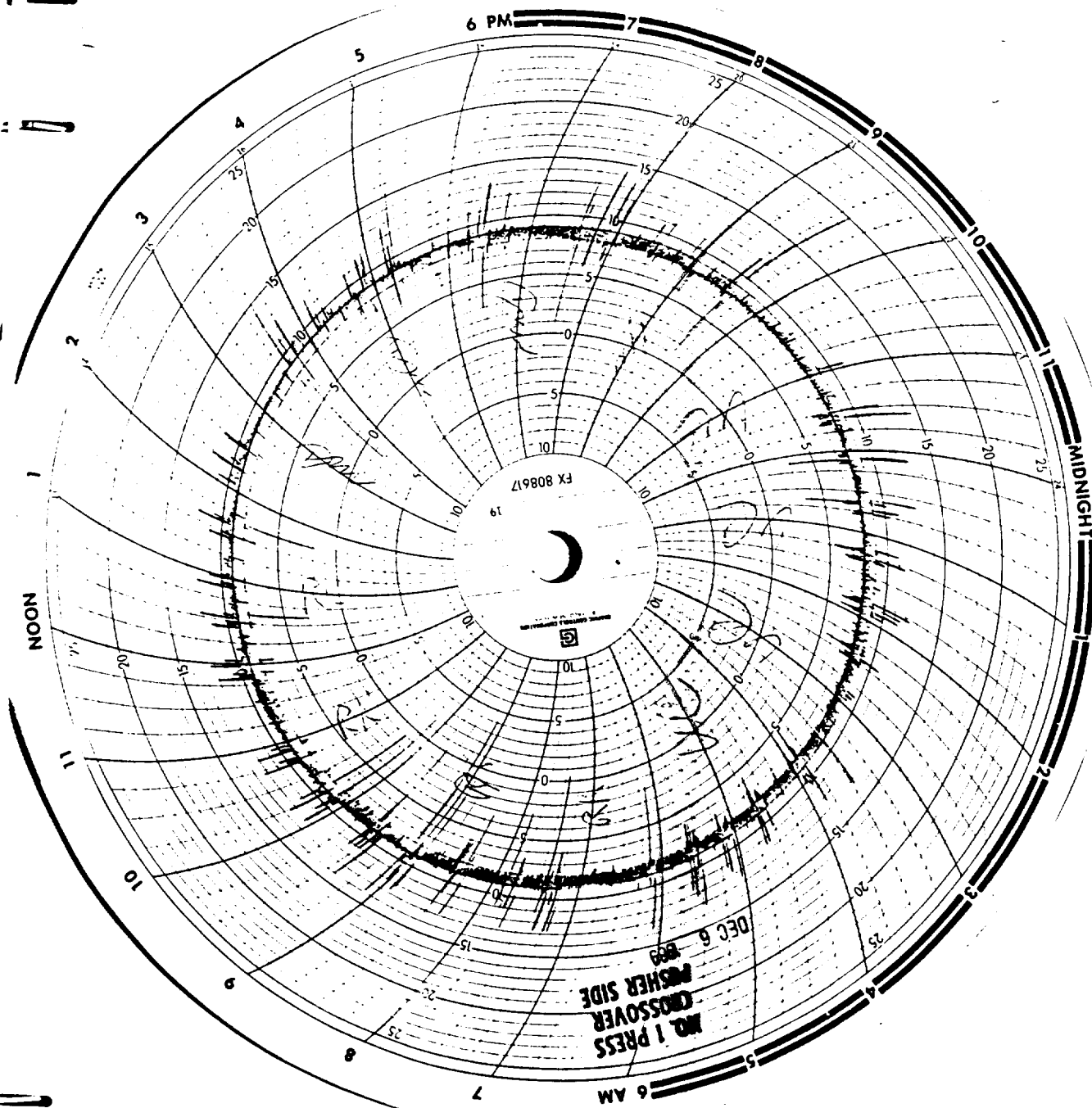


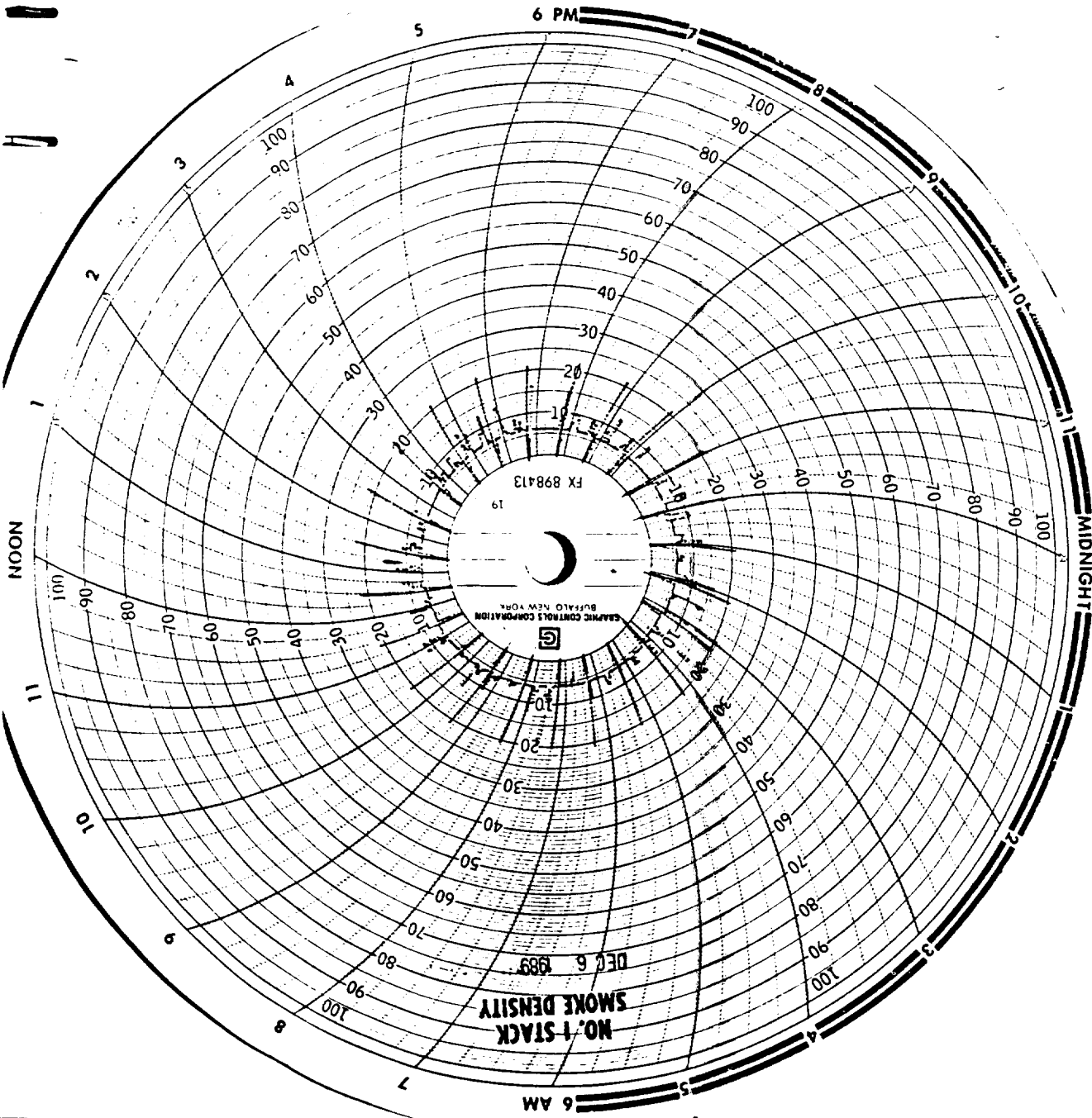


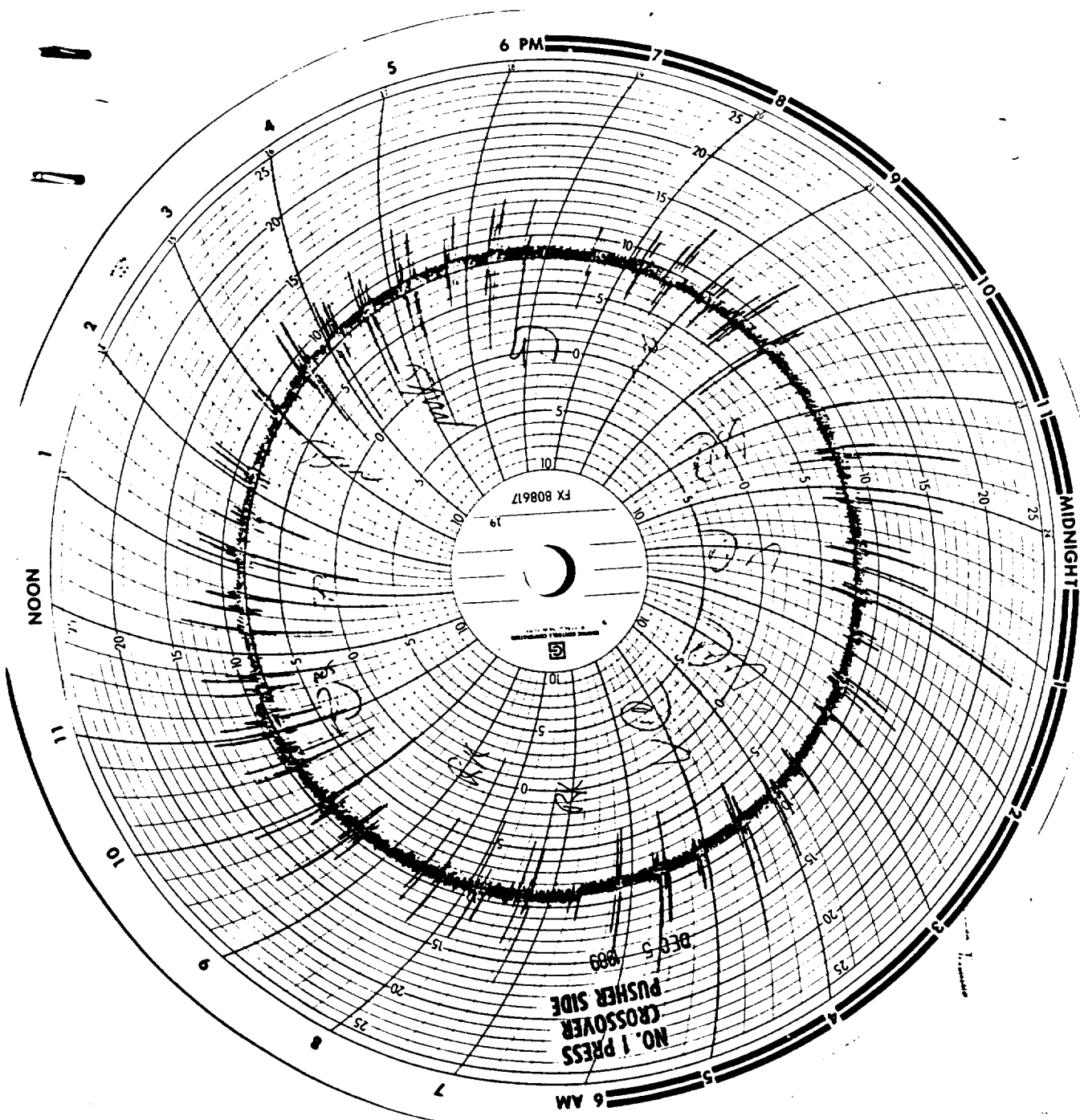


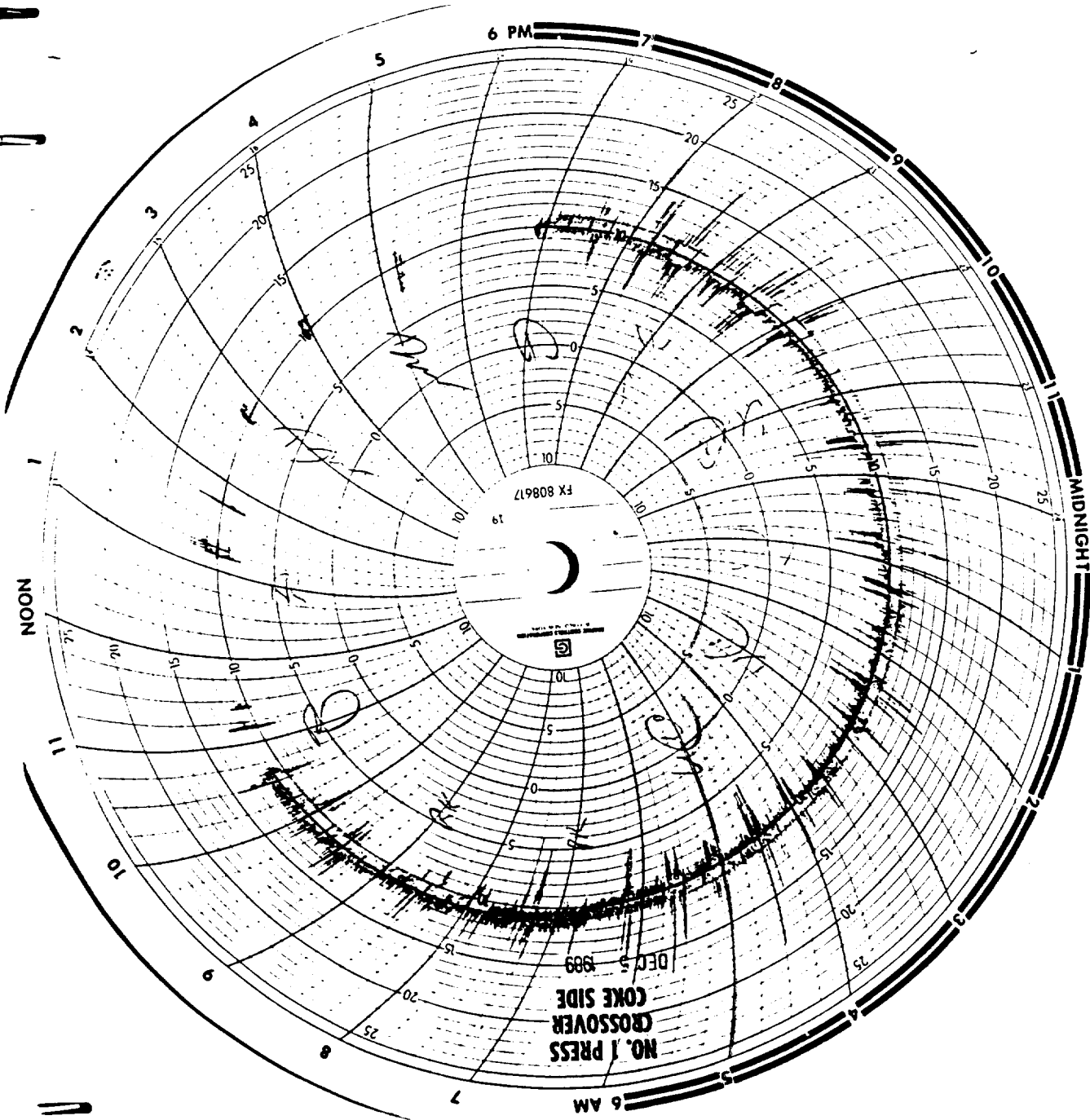






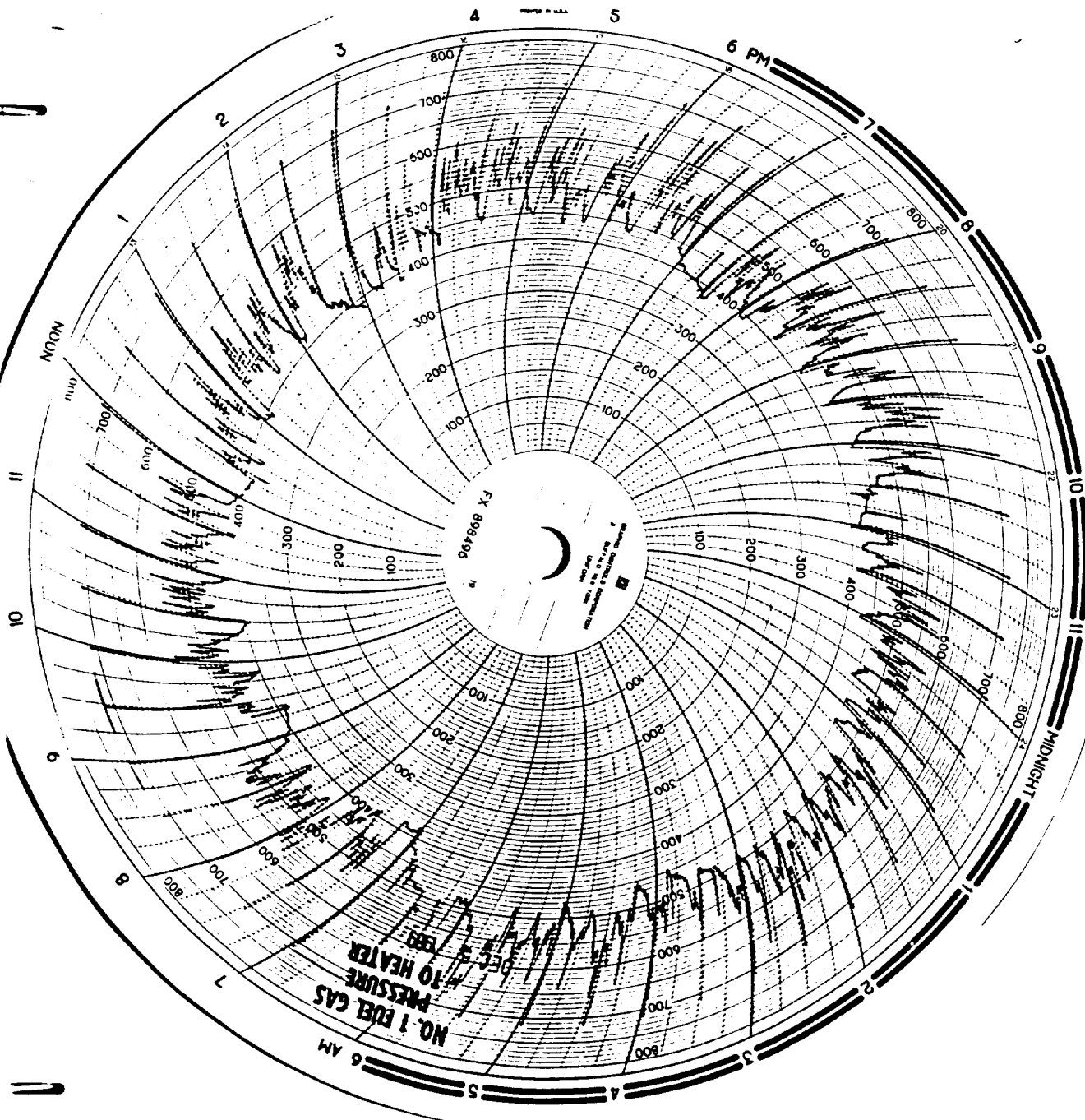


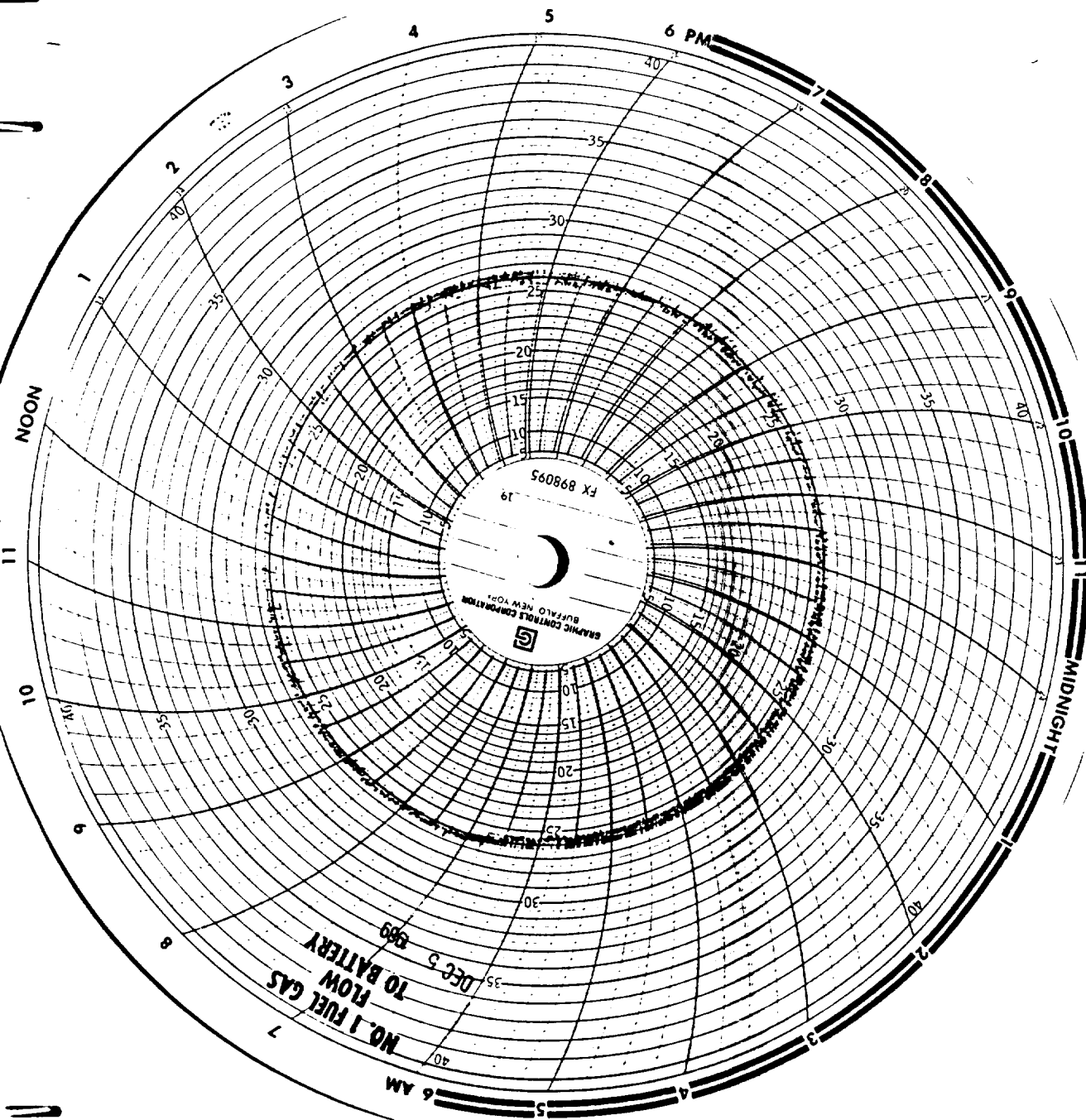


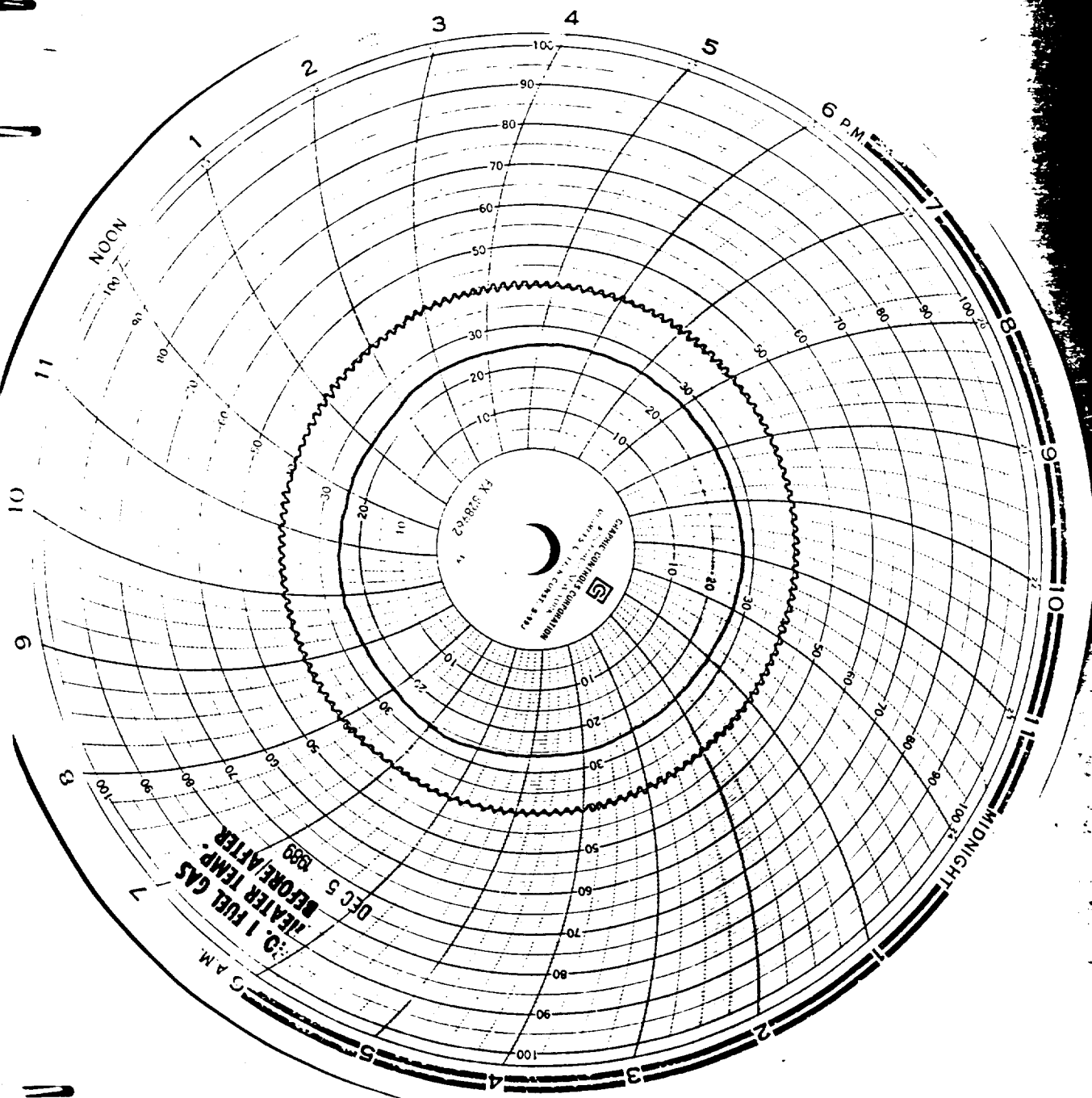


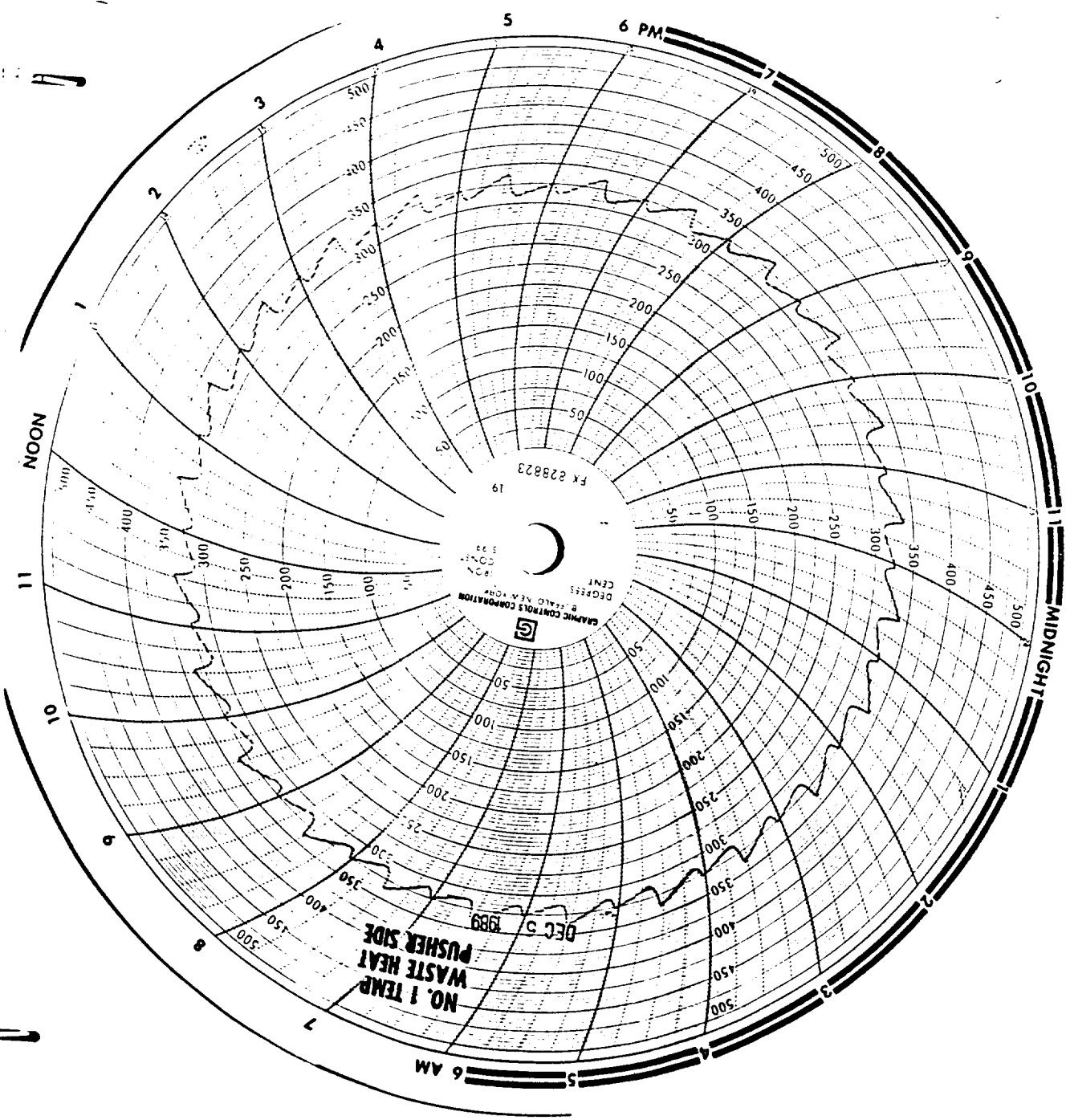
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CROSSOVER
COKE SIDE
DEC 5 1989

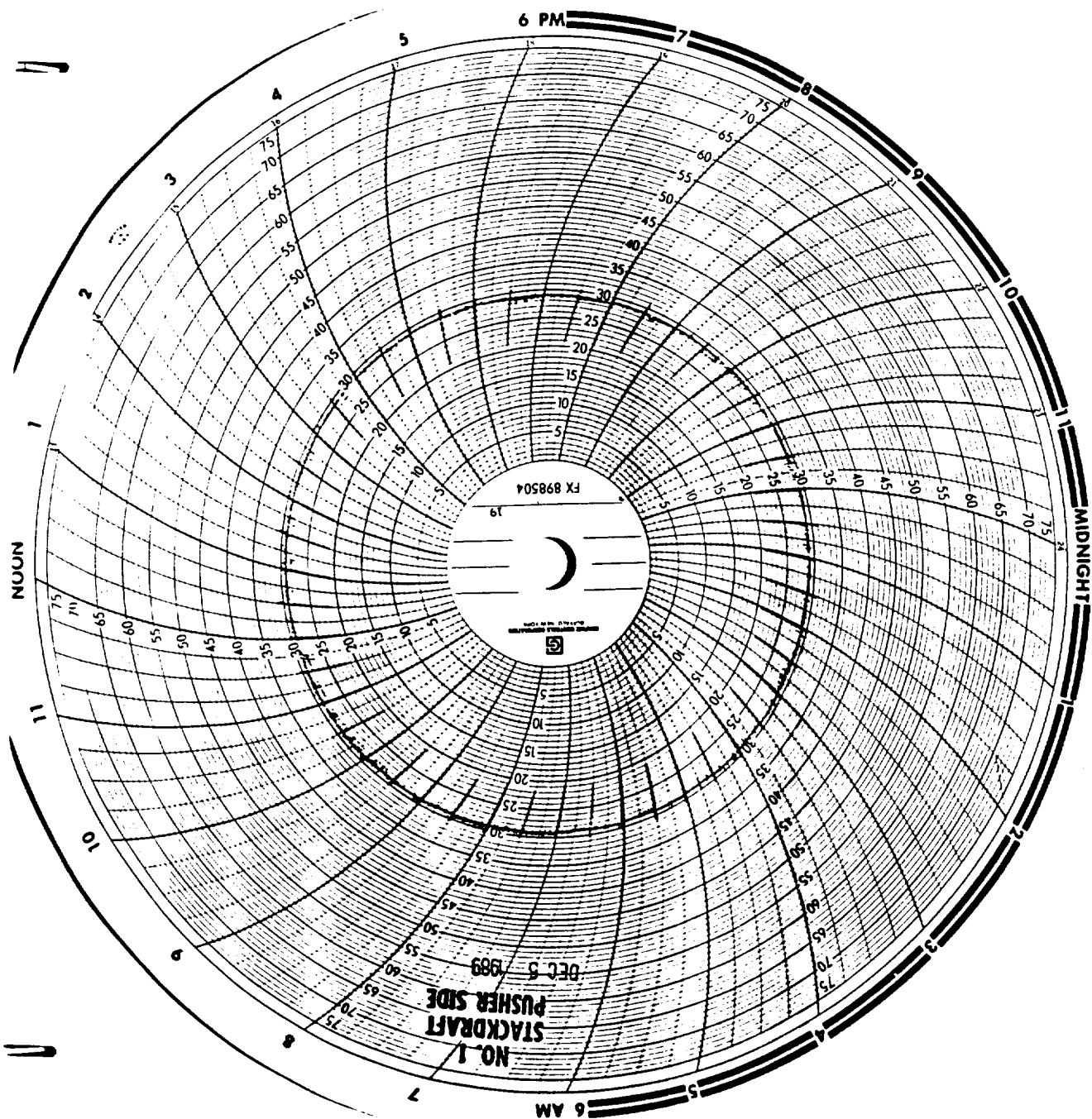
FX 808617











FX 898504

NO. 1
STACKDRAFT
PUSHER SIDE

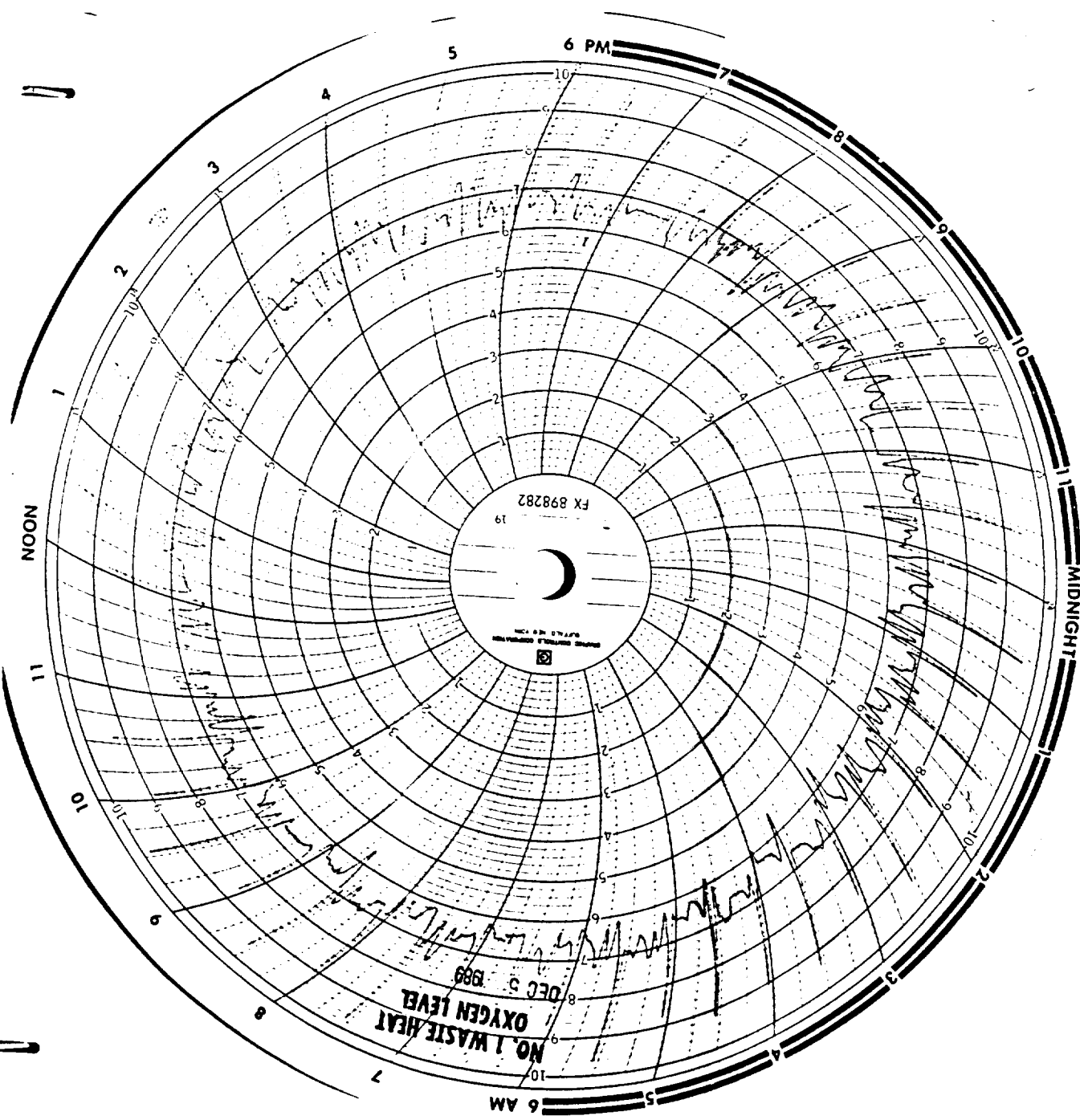
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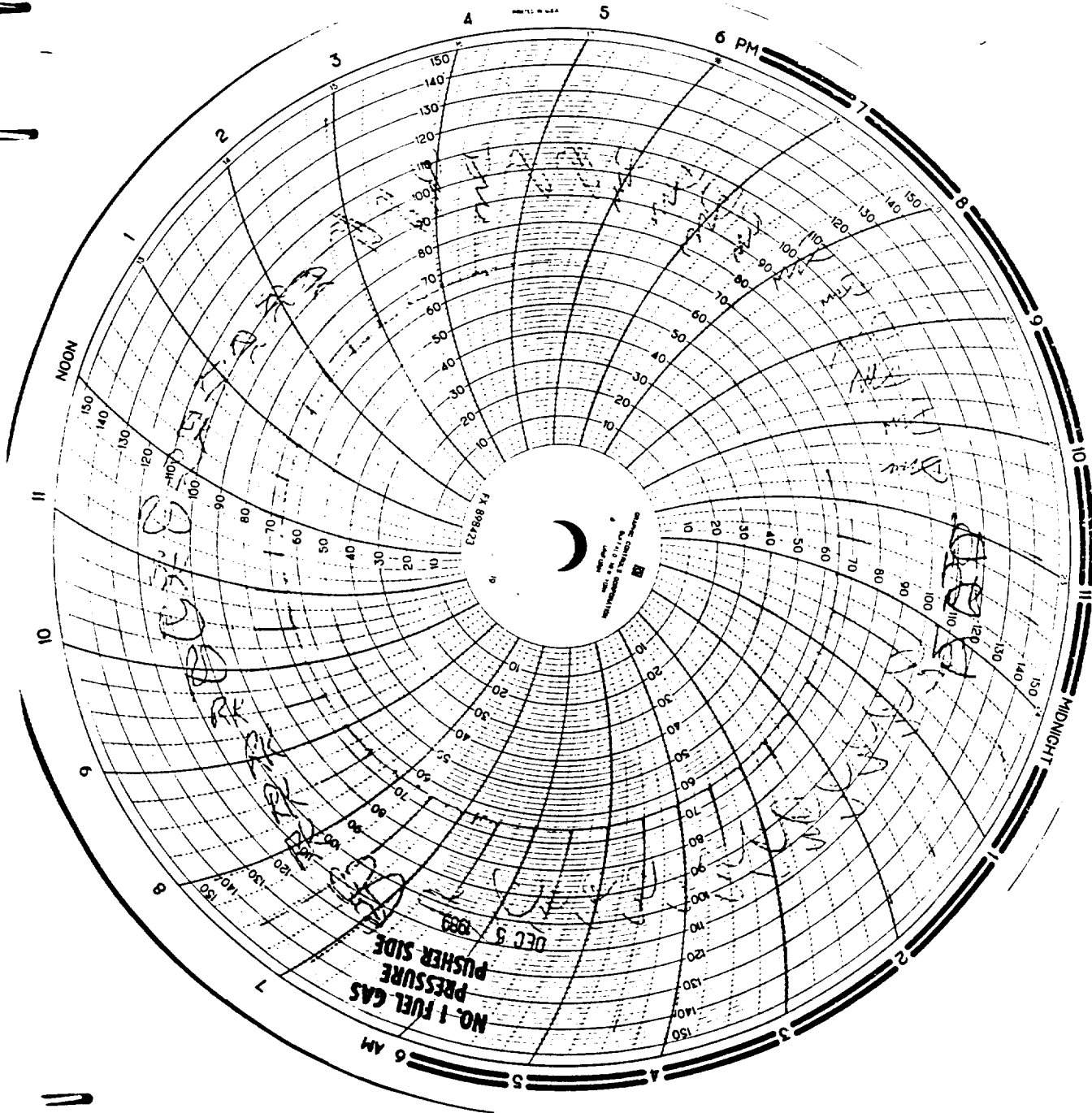
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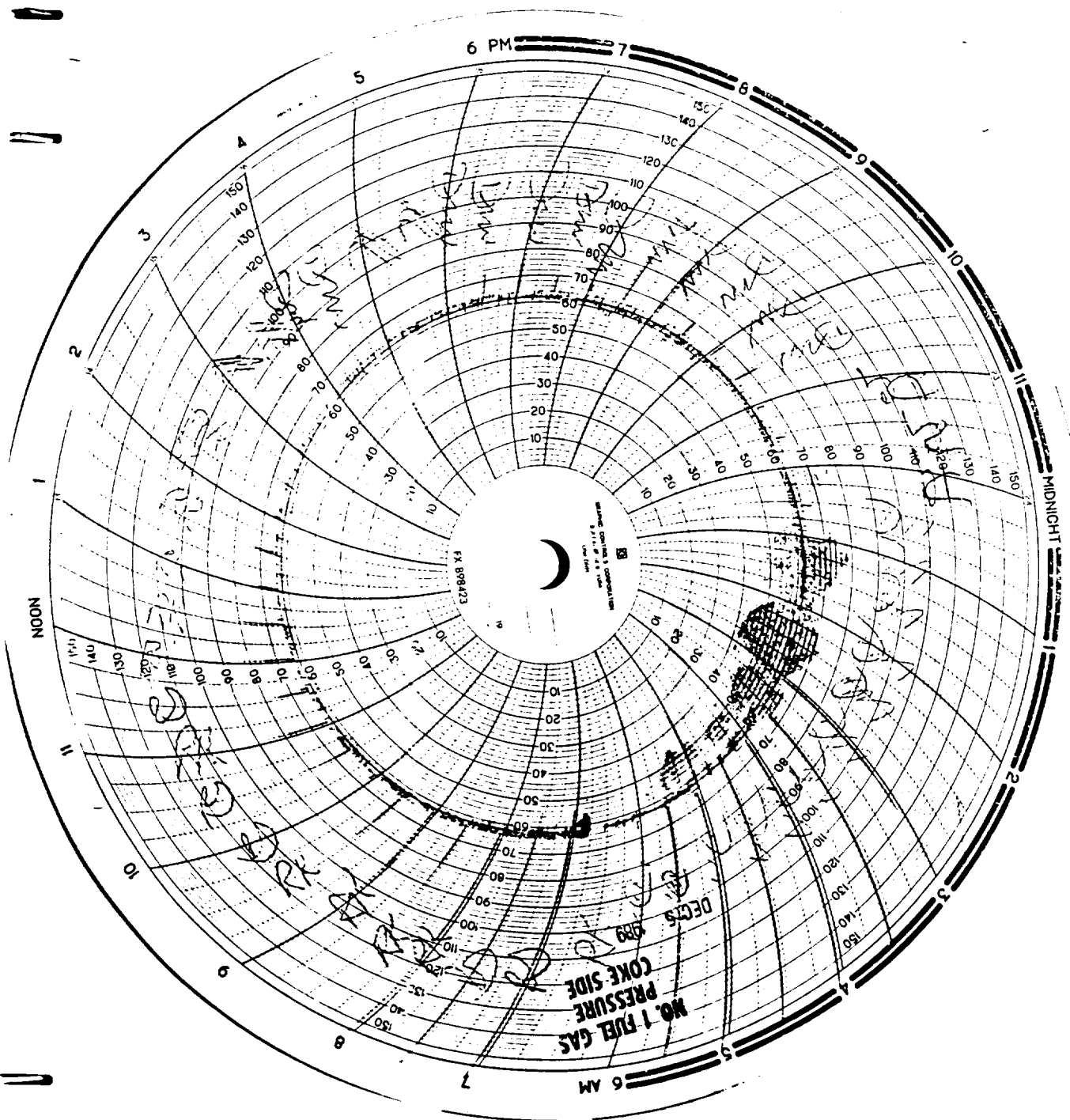
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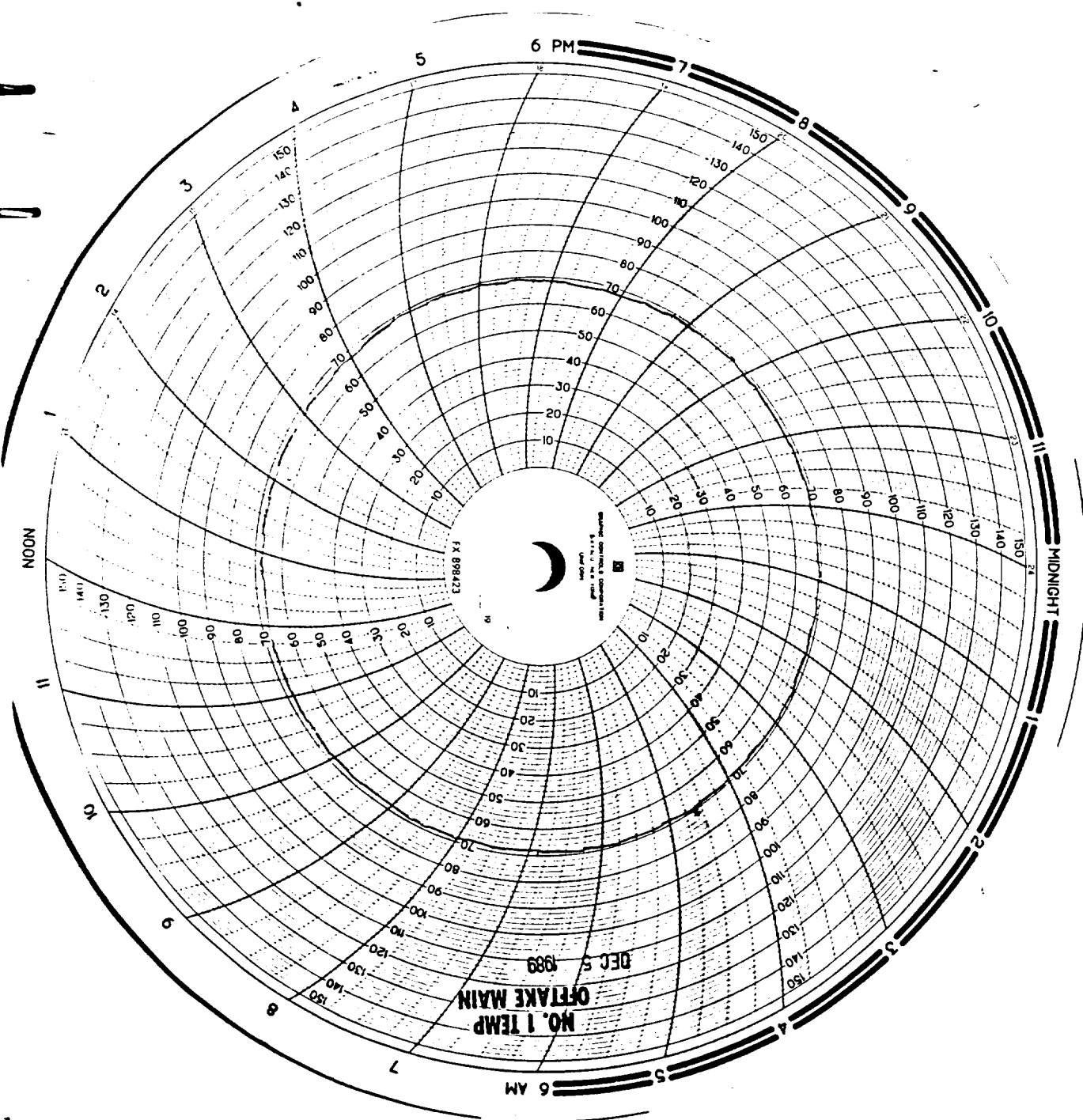
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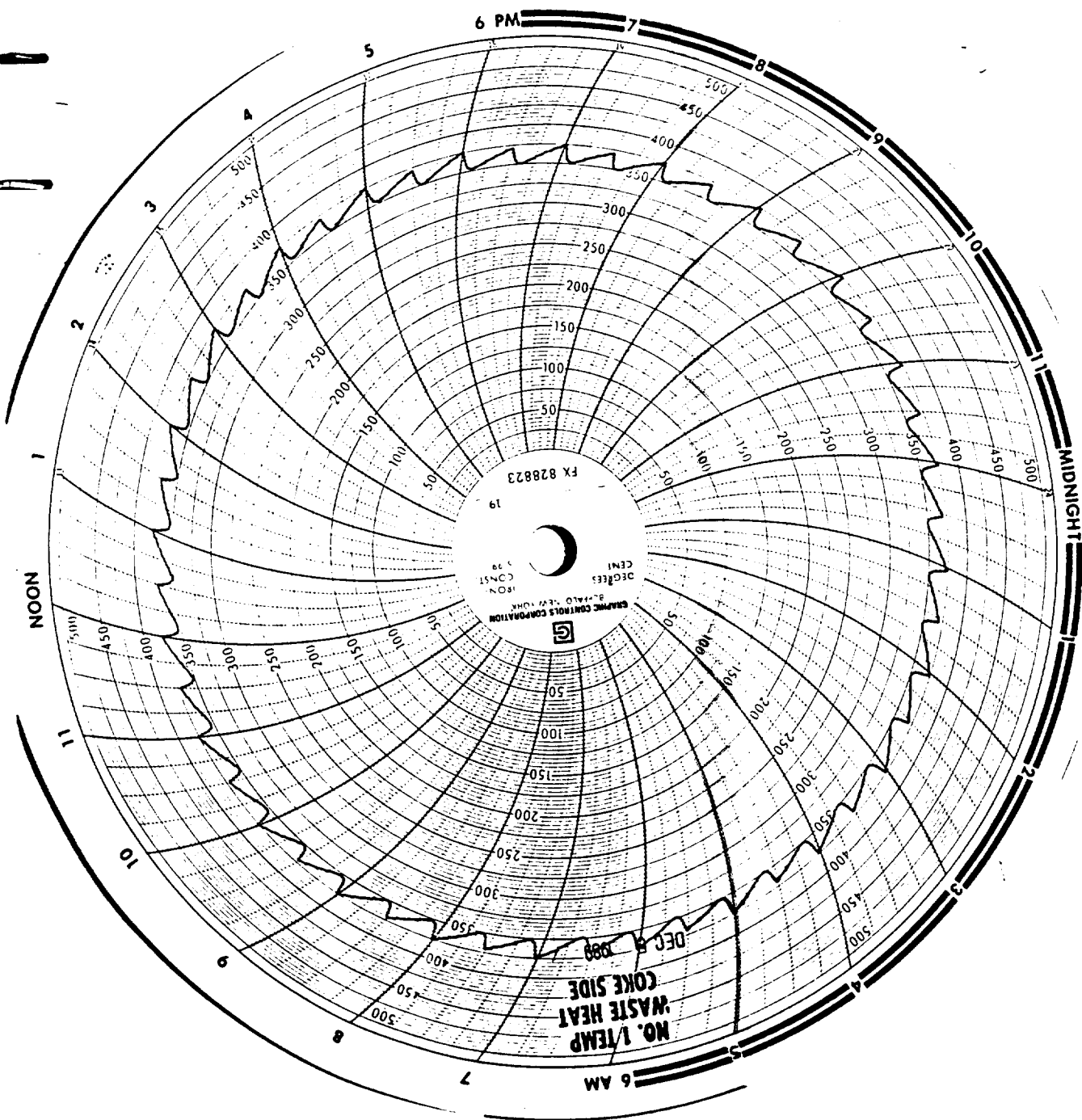
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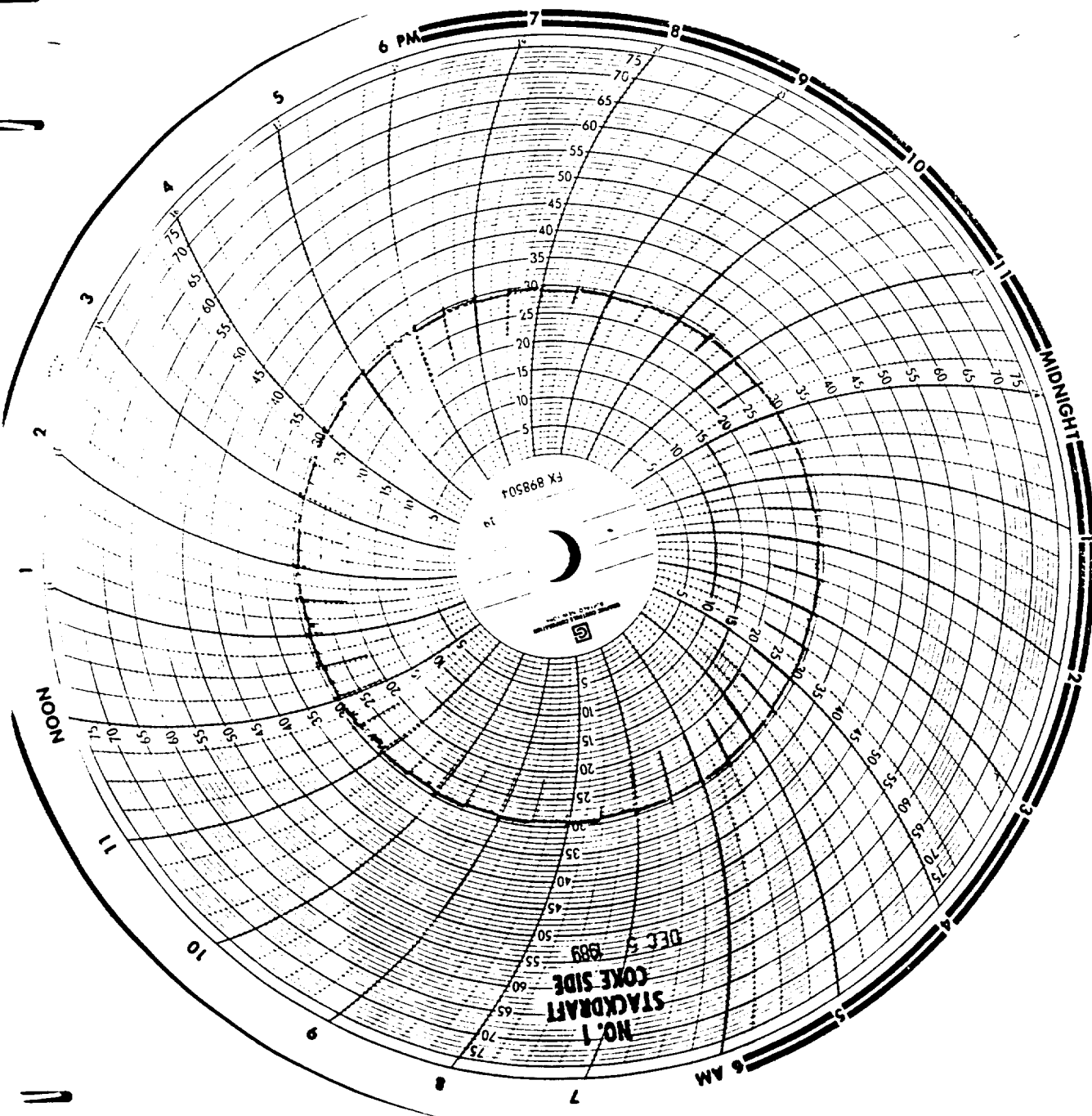


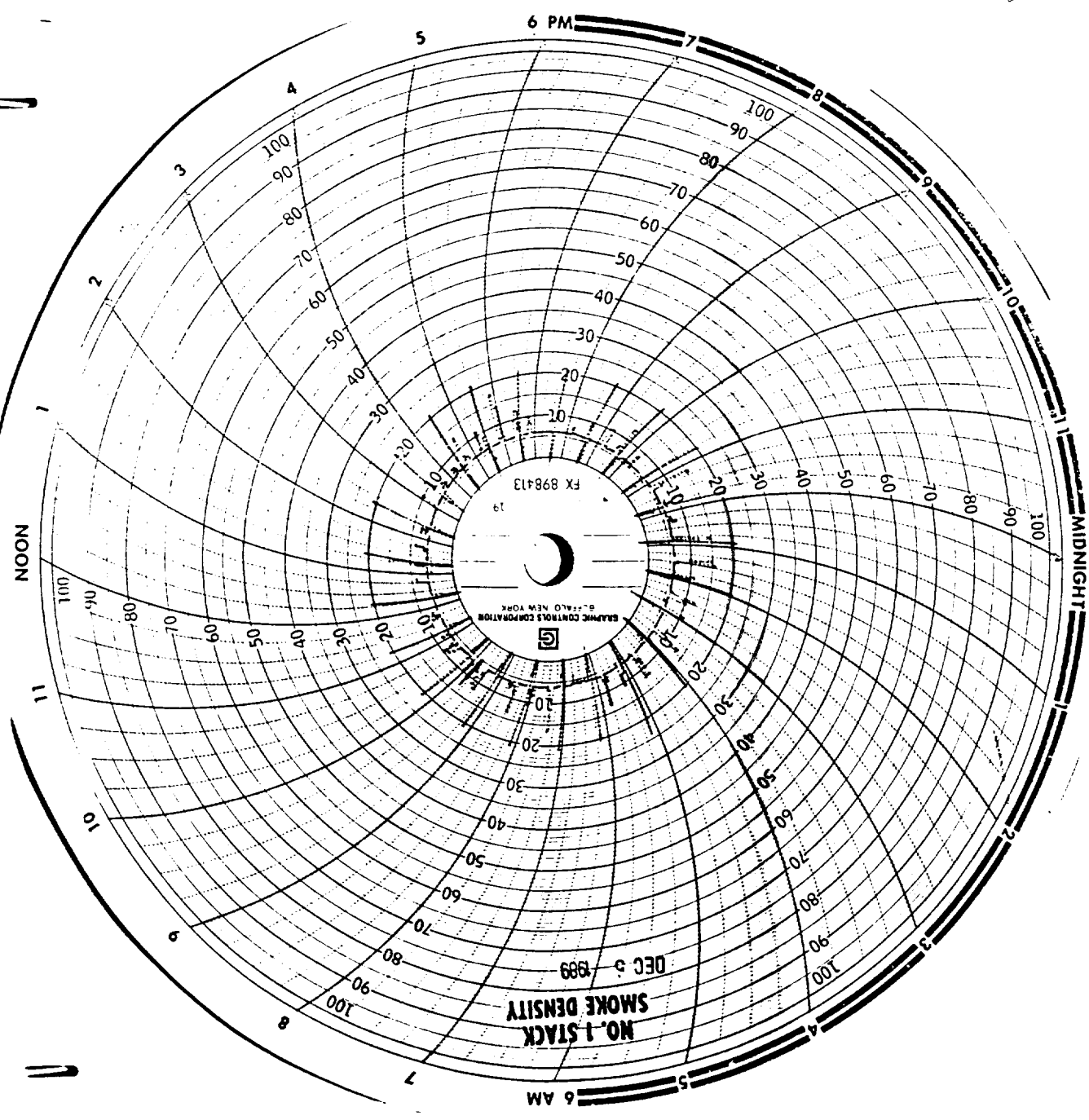












APPENDIX D
PROCESS DATA

THERMOCOUPLE CALIBRATION DATA SHEET

Thermocouple No. : 7-1 Date: 10-3-89

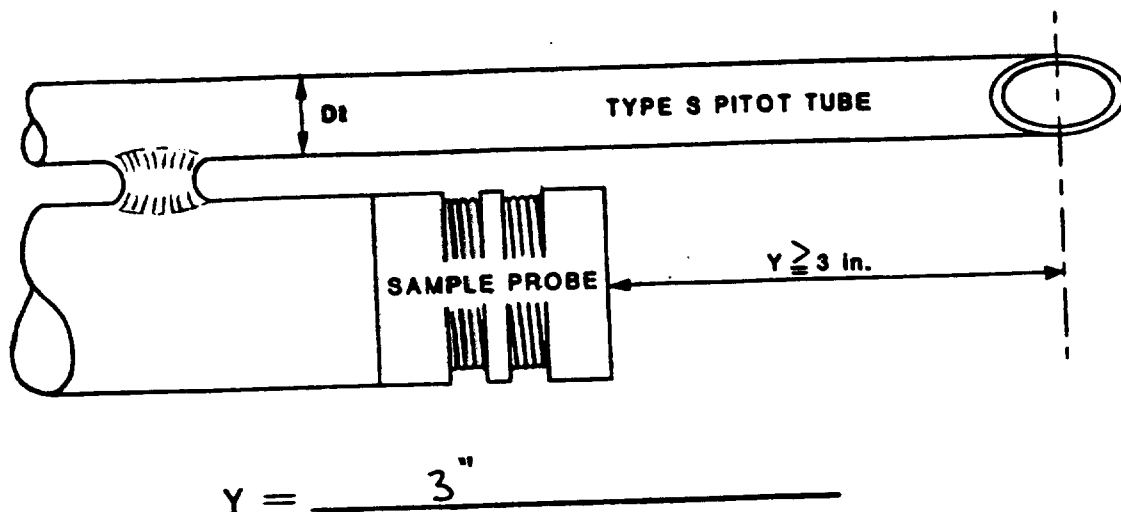
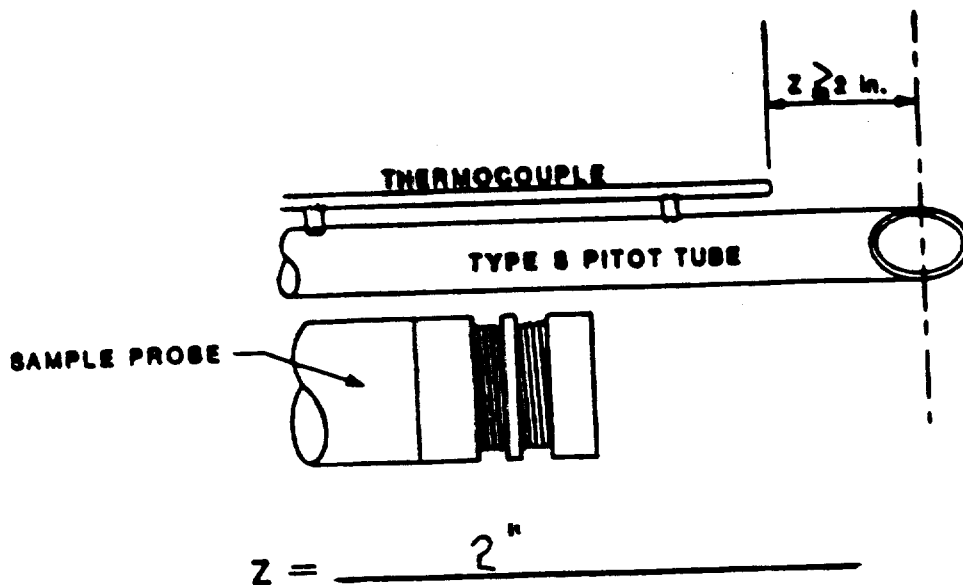
Ambient Temperature: ~70 °F Barometric Pressure: 29.27" Hg

Calibrator: TWS Reference: Mercury-in-glass: ✓

Other: _____

Reference Point No.	Source (Specify)	Reference Thermometer Temperature °F	Thermocouple Potentiometer Temperature °F	Difference %
1	AMBIENT AIR	72	65	10.8
2	OIL	373	370	0.8
3	WATER	212	217	2.3
			Average % Difference	4.6

PITOT ALIGNMENT CALIBRATIONS



Determined Coefficient 0.84

Pitot I.D. No. 7-1 Date 8-24-89 Performed By TWS

TYPE S PITOT TUBE
CALIBRATION SHEET

BCM

BCM Engineers

Engineers Planners Scientists and Laboratory Services

5777 Baum Boulevard • Pittsburgh PA 15208 • (412) 381-4000

DRAWN BY: JSA

PROJECT NO:

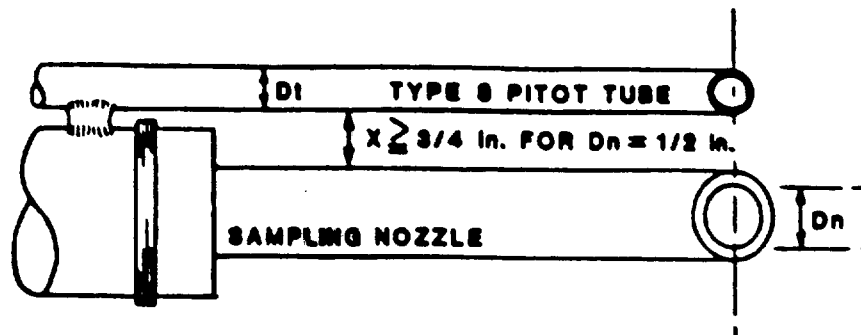
SCALE: NONE

FILE NO:

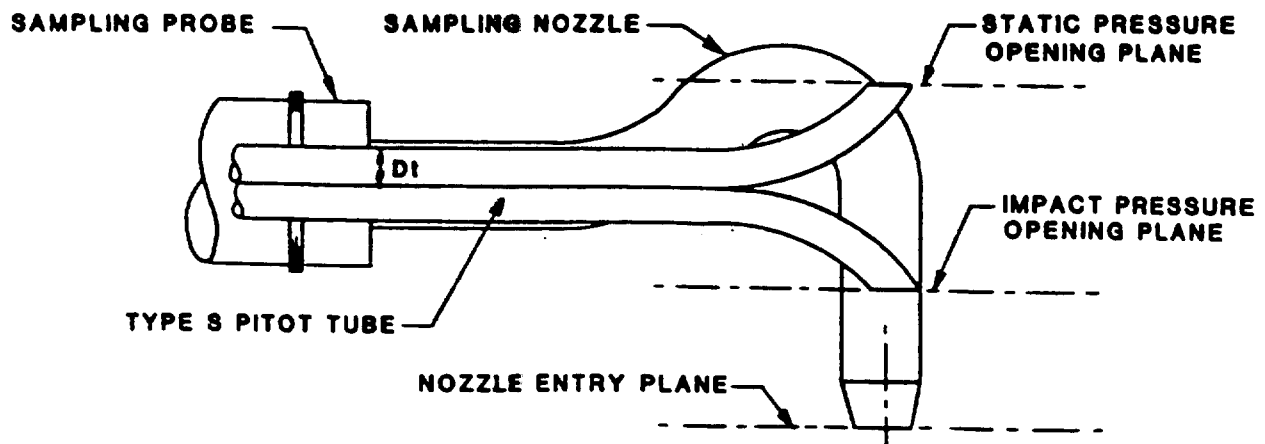
DATE: SEPT. 1989

SHEET 4 OF 4

PITOT ALIGNMENT CALIBRATIONS



$X = \underline{\geq 3/4 \text{ "}}$



Is I_p higher than $N_p = \underline{\text{YES}}$

Pitot I.D. No. 7-1 Date 8-24-89 Performed By TWS

TYPE S PITOT TUBE CALIBRATION SHEET

BCM

BCM Engineers

Engineers Planners Scientists and Laboratory Services

5777 Baum Boulevard • Pittsburgh, PA 15206 • (412) 381-4000

DRAWN BY: JSA

PROJECT NO:

SCALE: NONE

FILE NO:

DATE: SEPT. 1989

SHEET 3 OF 4

CONSTRUCTION STANDARDS :

1. D_t - between 0.48 and 0.95 centimeters
2. $P_a = P_b$ $1.05 D_t \leq P \leq 1.50 D_t$
3. $\alpha_1, \alpha_2 < 10^\circ$
4. $\beta_1, \beta_2 < 5^\circ$
5. $Z \leq 0.32$ cm
6. $W \leq 0.08$ cm

PITOT ALIGNMENT STANDARDS :

1. $X \geq 3/4$ in.
2. l_p must be higher than N_p
3. $Z \geq 1.90$ cm
4. $Y \geq 3$ in.

TYPE S PITOT CALIBRATION STANDARDS



BCM Engineers

Engineers Planners Scientists and Laboratory Services

5777 Baum Boulevard • Pittsburgh, PA 15208 • (412) 381-8000

DRAWN BY: JSA

SCALE: NONE

DATE: SEPT. 1989

PROJECT NO:

FILE NO:

SHEET 1 OF 4

DRY GAS METER

WET TEST SYSTEM CALIBRATION

DATE 9-22-89

OPERATOR SIM PHILLIPS

CONSOLE NUMBER 562-128 Box 2

DATE 9-22-89										OPERATOR JIM THILIFT									
Orifice Reactor Le. H ₂ O	Minimum Volume of Gas cc ¹	WET TEST METER GAS VOLUMES AND TEMPERATURES						DRY TEST METER GAS VOLUMES AND TEMPERATURES						Total Test Time minutes	Barometer Reading, Inches Hg				
		Initial		Final		Net Volume cc ¹	Avg. Temp. °F	Initial		Final		Net Volume cc ¹	Avg. Temp. °F						
		V ₁	T ₁	V ₂	T ₂			V ₁	T ₁	V ₂	T ₂								
AM	5	0.000	78	5.000	79	5.000	78.5	695.965	70.703	93	78	5.018	85.5	13.00	29.05				
0.5	5	0.000	79	5.000	79	5.000	79	701.247	70.248	107	87	4.998	97	10.767	29.04				
0.75	5	0.000	78	5.000	78	5.000	78	706.753	71.869	117	93	5.116	105	9.467	29.04				
1.00	5	0.000	78	5.000	78	5.000	78	713.415	72.824	113	97	10.406	105	15.383	29.04				
1.50	10	0.000	78	10.000	78	10.000	78	724.352	73.865	127	98	10.513	112.5	13.583					
2.00	10	0.000	78																
2.50	10																		

• Check at least every 2 minutes and adjust if needed.

CALCULATIONS

$$V = \frac{(V_2)(P_2)(T_2 + 460)}{(V_1)(P_1)(T_1 + 460)}$$

$$AM = \frac{0.0117 (AM)}{(P_2)(T_2 + 460)} \left[\frac{(T_2 + 460)^2}{(V_2)} \right]$$

Calc. by: JEP II
Checked by: RY
Date: 9-22-89

GAS CALCULATIONS				AM CALCULATIONS			
AM	5.000	129.05	185.5	0.0117	1.5	78.5	13.00
0.5	15.018	129.05	185.5	0.0117	1.75	79	10.767
0.75	14.918	129.04	185.5	0.0117	1.97	78	9.467
1.00	15.000	129.04	185.5	0.0117	1.105	78	15.383
1.50	15.116	129.04	185.5	0.0117	1.150	78	13.583
2.00	15.0406	129.04	185.5	0.0117	1.105	78	13.583
2.50	15.0406	129.04	185.5	0.0117	1.105	78	13.583
AVERAGE 0.997				AVERAGE 1.993			

APPENDIX C
CALIBRATIONS

SHENANGO
NO. 1 COKE OVEN BATTERY COMBUSTION STACK

12-6-89
RUN 3

EPA METHOD 5

SYMBOL	DESCRIPTION	VALUE
Qs	= Stack gas flow, acfm	
Qs(std)	= Stack gas flow, dscfm	97551.0
Ts	= Average stack temperature, deg. F	42835.2
Bws	= Moisture content of the gas stream, %	535.4
		14.53
CO2	= CO2 in stack gas, %	
O2	= O2 in stack gas, %	5
CO	= CO in stack gas, %	9
N2	= N2 in stack gas, %	0
		86
I	= Isokinetic ratio, percent	100.9
C's	= Particulate concentration, gr/dscf	0.0031
E	= Particulate emission rate, lb/hr	1.14

SHENANGO
NO. 1 COKE OVEN BATTERY COMBUSTION STACK

12-6-89
RUN 3

EPA METHOD 5

SYMBOL	DESCRIPTION	VALUE
Theta	= Duration of test, min.	= 120
Vm	= Dry sample volume (meter conditions), cu. ft.	= 118.260
SQRT(dp)	= Average of square roots of pitot pressure differential, in. H ₂ O	= 0.286
dH	= Orifice pressure drop, in. water	= 3.40
Ts	= Average stack temperature, deg. F	= 535.4
Tm	= Average dry gas meter temperature, deg. F	= 104.4
CO ₂	= CO ₂ in stack gas, %	= 5.0
O ₂	= O ₂ in stack gas, %	= 9.0
CO	= CO in stack gas, %	= 0.0
N ₂	= N ₂ in stack gas, %	= 86.0
Pbar	= Barometric pressure, in. Hg	= 29.05
Ps	= Stack pressure (absolute), in. Hg.	= 28.98
Cp	= Pitot correction factor, dimensionless	= 0.84
Y	= Dry gas meter correction factor	= 1.015
Dn	= Diameter of nozzle, in.	= 0.525
Ds	= Diameter of stack, in.	= 114
Vwc	= Volume of liquid collected in impingers and silica gel, ml	= 397.1
Wt	= Total particulate catch, mg	= 22.2
An	= Area of the nozzle, sq. ft.	= 0.00150
As	= Area of the stack, sq. ft.	= 70.88
Md	= Dry molecular weight of stack gas, lb/lb-mole	= 29.16
Vw(std)	= Volume of liquid collected, cu. ft.	= 18.691
Ms	= Molecular weight of stack gas, lb/lb-mole	= 27.54
Vm(std)	= Dry sample volume (standard conditions), cu. ft.	= 109.922
Vs	= Stack velocity, ft/sec	= 22.94

SHENANGO
NO. 1 COKE OVEN BATTERY COMBUSTION STACK

12-6-89
RUN 2

EPA METHOD 5

SYMBOL	DESCRIPTION	VALUE
Qs	= Stack gas flow, acfm	= 92287.9
Qs(std)	= Stack gas flow, dscfm	= 40774.0
Ts	= Average stack temperature, deg. F	= 535.4
Bws	= Moisture content of the gas stream, %	= 13.95
CO2	= CO2 in stack gas, %	= 5.5
O2	= O2 in stack gas, %	= 8.2
CO	= CO in stack gas, %	= 0
N2	= N2 in stack gas, %	= 86.3
I	= Isokinetic ratio, percent	= 103.0
C's	= Particulate concentration, gr/dscf	= 0.0060
E	= Particulate emission rate, lb/hr	= 2.09

SHENANGO
NO. 1 COKE OVEN BATTERY COMBUSTION STACK

12-6-89
RUN 2

EPA METHOD 5

SYMBOL	DESCRIPTION	VALUE
Theta	= Duration of test, min.	= 120
Vm	= Dry sample volume (meter conditions), cu. ft.	= 111.446
SQRT(dP)	= Average of square roots of pitot pressure differential, in. H ₂ O	= 0.271
dH	= Orifice pressure drop, in. water	= 3.10
Ts	= Average stack temperature, deg. F	= 535.4
Tm	= Average dry gas meter temperature, deg. F	= 86.7
CO ₂	= CO ₂ in stack gas, %	= 5.5
O ₂	= O ₂ in stack gas, %	= 8.2
CO	= CO in stack gas, %	= 0.0
N ₂	= N ₂ in stack gas, %	= 86.3
Pbar	= Barometric pressure, in. Hg	= 29.03
Ps	= Stack pressure (absolute), in. Hg.	= 28.96
Cp	= Pitot correction factor, dimensionless	= 0.84
Y	= Dry gas meter correction factor	= 1.015
Dn	= Diameter of nozzle, in.	= 0.525
Ds	= Diameter of stack, in.	= 114
Vwc	= Volume of liquid collected in impingers and silica gel, ml	= 367.7
Wt	= Total particulate catch, mg	= 41.55
An	= Area of the nozzle, sq. ft.	= 0.00150
As	= Area of the stack, sq. ft.	= 70.88
Md	= Dry molecular weight of stack gas, lb/lb-mole	= 29.21
Vw(std)	= Volume of liquid collected, cu. ft.	= 17.308
Ms	= Molecular weight of stack gas, lb/lb-mole	= 27.64
Vm(std)	= Dry sample volume (standard conditions), cu. ft.	= 106.788
Vs	= Stack velocity, ft/sec	= 21.70

SHENANGO
NO. 1 COKE OVEN BATTERY COMBUSTION STACK

12-5-89
RUN 1

EPA METHOD 5

SYMBOL	DESCRIPTION	VALUE
Qs	= Stack gas flow, acfm	= 93389.8
Qs(std)	= Stack gas flow, dscfm	= 40804.6
Ts	= Average stack temperature, deg. F	= 550.833
Bws	= Moisture content of the gas stream, %	= 13.70
CO2	= CO2 in stack gas, %	= 4.7
O2	= O2 in stack gas, %	= 8.7
CO	= CO in stack gas, %	= 0
N2	= N2 in stack gas, %	= 86.6
I	= Isokinetic ratio, percent	= 108.0
C's	= Particulate concentration, gr/dscf	= 0.0040
E	= Particulate emission rate, lb/hr	= 1.39

SHENANGO
NO. 1 COKE OVEN BATTERY COMBUSTION STACK

12-5-89
RUN 1

EPA METHOD 5

SYMBOL	DESCRIPTION	VALUE
Theta	= Duration of test, min.	= 120
Vm	= Dry sample volume (meter conditions), cu. ft.	= 113.991
SQRT(dP)	= Average of square roots of pitot pressure differential, in. H ₂ O	= 0.272
dH	= Orifice pressure drop, in. water	= 3.23
Ts	= Average stack temperature, deg. F	= 550.8
Tm	= Average dry gas meter temperature, deg. F	= 73.6
CO ₂	= CO ₂ in stack gas, %	= 4.7
O ₂	= O ₂ in stack gas, %	= 8.7
CO	= CO in stack gas, %	= 0.0
N ₂	= N ₂ in stack gas, %	= 86.6
Pbar	= Barometric pressure, in. Hg	= 29.07
Ps	= Stack pressure (absolute), in. Hg.	= 29.00
Cp	= Pitot correction factor, dimensionless	= 0.84
Y	= Dry gas meter correction factor	= 1.015
Dn	= Diameter of nozzle, in.	= 0.525
Ds	= Diameter of stack, in.	= 114
Vwc	= Volume of liquid collected in impingers and silica gel, ml	= 378.0
Wt	= Total particulate catch, mg	= 28.9
An	= Area of the nozzle, sq. ft.	= 0.00150
As	= Area of the stack, sq. ft.	= 70.88
Md	= Dry molecular weight of stack gas, lb/lb-mole	= 29.10
Vw(std)	= Volume of liquid collected, cu. ft.	= 17.792
Ms	= Molecular weight of stack gas, lb/lb-mole	= 27.58
Vm(std)	= Dry sample volume (standard conditions), cu. ft.	= 112.098
Vs	= Stack velocity, ft/sec	= 21.96

METHOD 5 TRAIN ANALYTICAL PARTICULATE DATA

Plant SACNANGA STEEL INC. Date 12-7-89 Run No. 3

Sample location #1 BATTERY STACK Relative humidity 410%

Density of acetone (pa) 0.7857 g/ml
 Acetone rinse container No. 44
 Acetone rinse volume (Vaw) 74 ml
 Acetone blank residue concentration (Ca) .148 mg/g
 $W_a = Ca \cdot V_{aw} \cdot \rho_a = (.148) (74) (.7857) = 8.605$ mg
 Date and time of wt 12-10-89 0924 Gross wt 103044.5 mg
 Date and time of wt 12-11-89 — Gross wt 103044.0 mg
 Average Gross wt 103044.25 mg
 Tare wt 103026.8 mg
 Less acetone blank wt (Wa) -8.60 mg
 Weight of particulate in acetone rinse 14.15 mg

Water rinse container No. _____
 Water rinse volume (Vww) _____ ml
 Water blank residue concentration (Cw) _____ mg/g
 $W_w = Ca \cdot V_{ww} \cdot \rho_a = () () () =$ mg
 Date and time of wt _____ Gross wt _____ mg
 Date and time of wt _____ Gross wt _____ mg
 Average Gross wt _____ mg
 Tare wt _____ mg
 Less water blank wt (Ww) _____ mg
 Weight of particulate in water rinse _____ mg

Filter No. 142
 Date and time of wt. 12-10-89 0917 Gross wt 408.6 mg
 Date and time of wt. 12-11-89 — Gross wt 408.5 mg
 Average Gross wt 408.55 mg
 Tare wt 400.8 mg
 Weight of particulate on filter(s) 7.75 mg
 Weight of particulate in acetone rinse 14.15 mg
 Weight of particulate in water rinse _____ mg
 Total weight of particulate 22.2 mg

METHOD 5 TRAIN ANALYTICAL PARTICULATE DATA

Plant Shenandoah STEEL INC. Date 12-7-89 Run No. 2

Sample location #1 BATTERY STACK Relative humidity 410 %

Density of acetone (pa) 0.7857 g/ml
 Acetone rinse container No. 5C
 Acetone rinse volume (Vaw) 118 ml
 Acetone blank residue concentration (Ca) .148 mg/g
 $W_a = C_a V_{aw} p_a = (.148) (118) (.7857) = 13.7$ mg
 Date and time of wt 12-10-89 0923 Gross wt 100.509.3 mg
 Date and time of wt 12-11-89 1623 Gross wt 100.508.9 mg
 Average Gross wt 100.504.1 mg
 Tare wt 100.464.9 mg
 Less acetone blank wt (Wa) 13.7 mg
 Weight of particulate in acetone rinse 30.5 mg

Water rinse container No. _____ ml
 Water rinse volume (Vww) _____ mg/g
 Water blank residue concentration (Cw) _____ mg
 $W_w = C_w V_{ww} p_w = () () () =$ mg
 Date and time of wt _____ Gross wt _____ mg
 Date and time of wt _____ Gross wt _____ mg
 Average Gross wt _____ mg
 Tare wt _____ mg
 Less water blank wt (Ww) _____ mg
 Weight of particulate in water rinse _____ mg

Filter No. 141
 Date and time of wt. 12-10-89 0918 Gross wt 411.9 mg
 Date and time of wt. 12-11-89 _____ Gross wt 411.8 mg
 Average Gross wt 411.85 mg
 Tare wt 400.8 mg
 Weight of particulate on filter(s) 11.05 mg
 Weight of particulate in acetone rinse 30.50 mg
 Weight of particulate in water rinse _____ mg
 Total weight of particulate 41.55 mg

METHOD 5 TRAIN ANALYTICAL PARTICULATE DATA

Plant SACNAUGO STEEL INC. Date 12-7-89 Run No. 1

Sample location #1 BATTERY STACK Relative humidity 110%

Density of acetone (ρ_a) 0.7857 g/ml
 Acetone rinse container No. 5 T
 Acetone rinse volume (V_{aw}) 115 ml
 Acetone blank residue concentration (C_a) .148 mg/g
 $W_a = C_a V_{aw} \rho_a = (.148) (115) (.7857) = 13.4$ mg
 Date and time of wt 12-10-89 0922 Gross wt 9750.19 mg
 Date and time of wt 12-11-89 Gross wt 97504.5 mg
 Average Gross wt 97504.4 mg
 Tare wt 97476.6 mg
 Less acetone blank wt (W_a) 13.4 mg
 Weight of particulate in acetone rinse 14.4 mg

Water rinse container No. _____
 Water rinse volume (V_{ww}) _____ ml
 Water blank residue concentration (C_w) _____ mg/g
 $W_w = C_w V_{ww} \rho_w = () () () =$ mg
 Date and time of wt _____ Gross wt _____ mg
 Date and time of wt _____ Gross wt _____ mg
 Average Gross wt _____ mg
 Tare wt _____ mg
 Less water blank wt (W_w) _____ mg
 Weight of particulate in water rinse _____ mg

Filter No. 145
 Date and time of wt. 12-13-89 1000 Gross wt 421.8 mg
 Date and time of wt. 12-14-89 0920 Gross wt 422.2 mg
 Average Gross wt 422.0 mg
 Tare wt 407.5 mg
 Weight of particulate on filter(s) 14.5 mg
 Weight of particulate in acetone rinse 14.4 mg
 Weight of particulate in water rinse — mg
 Total weight of particulate 28.9 mg

BLANK ANALYTICAL DATA

Plant Shenango STEEL INC.

Sample location #1 BATTERY STACK

Type of blank ACETONE

Container number 50

Density of blank (ρ_a) 0.7857 g/ml

Blank volume (V_a) 137 ml

Gross wt. 102232.1 mg

Tare wt. 102216.2 mg

Weight of blank (m_a) 15.9 mg

$$Ca = \frac{m_a}{V_a \rho_a} = \frac{(15.9)}{(137)(.7857)} = .148 \text{ mg/g}$$

APPENDIX B
CALCULATIONS

VISIBLE EMISSIONS OBSERVATION FORM

DRIVER DANIEL R PETROWAY

DATE 12-6-89

PLANT SHENANDOAH STEEL INC

OBSERVATION PERIOD: START: 1315-1345

FINISH: 1350-1420

OBSERVATION POINT: SOUTH OF #1 BATTERY

LOCATION IN VISITORS PARKING LOT

WEATHER:

DISTANCE FROM: 500 FT

DIRECTION FROM: SOUTH

HEIGHT: 400 FT

WIND:

SPEED: 13 mph

DIRECTION: SOUTH WEST

TEMPERATURE: 90° 45°

CONDITION: Grey And white clouds

MOON:

GROUND: 100% OVERCAST

WINDING CONDITIONS: FAIR

COLOR OF EMISSIONS: BLACK

TESTS: RUN #3

PERCENT OF READINGS ≥ 20%: 0

PERCENT OF READINGS ≥ 60%: 0

PERCENTAGE OPACITY: 0.9375%

REMARKS:

SIGNATURE: Daniel R Petroway

☒	0	15	30	45
1315	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	5	5
18	10	15	15	15
19	15	15	15	15
20	10	5	5	5
21	5	5	5	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	5	5	5
28	10	15	15	15
29	10	5	5	0

☒	0	15	30	45
1350	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	5	5	5	5
44	5	5	5	5
45	5	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	5	5
51	5	5	5	5
52	5	5	5	5
53	5	5	5	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
1420	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATION FORM

OVER DANIEL A. PETROUAY

12-6-89

CITY SHENANGO STEEL INC.

OBSERVATION PERIOD: START: 1427-1457

FINISH: 1503-1533

OBSERVATION POINT: SOUTH OF #1 BATTERY

SEEK IN VISITORS PARKING LOT

CE:

DISTANCE FROM: 500 FT

DIRECTION FROM: SOUTH

HEIGHT: 400 FT

SPEED: 10 MPH

DIRECTION: SOUTH WEST

TEMPERATURE: 45°

CONDITION: 100% OVERCAST RAIN

GROUND: Grey + white clouds

WINDING CONDITIONS: fair

TYPE OF EMISSIONS: BLACK

TESTS: RUN #3

PERCENT OF READINGS ≥ 20%: 0

PERCENT OF READINGS ≥ 60%: 0

PERCENTAGE OPACITY: 0

REMARKS: 0

SIGNATURE: Daniel R. Petrouay

1727	0	15	30	45
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	5	10
9	10	10	10	5
10	5	5	5	5
11	5	5	5	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
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26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

1503	0	15	30	45
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
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35	0	0	0	0
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51	0	0	0	0
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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 OBSERVATION FORM

SERVER DANIEL R. PETROVAY.

DATE 12-6-89

PLANT SHAWANGA STEEL TNS

OBSERVATION PERIOD: START: 1049-1119

FINISH: 1128-1158

OBSERVATION POINT: SOUTH of #1 BATTERY

LOCATION IN VISITORS PARKING LOT

WEATHER:

DISTANCE FROM: 500 FT.

DIRECTION FROM: SOUTH

HEIGHT: 400 FT.

WIND:

SPEED: 7 MPH

DIRECTION: SOUTH

TEMPERATURE: 24.67° 70% HUM 41°

CONDITION: Blue sky with grey and

few clouds

GROUND: 90% overcast 10% blue

WINDING CONDITIONS: fair to good

TYPE OF EMISSIONS: BLACK

IDENTIFICATION: Run #2

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

REMARKS:

☒	0	15	30	45
1049	20	20	15	10
1	5	5	5	5
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	10	10
9	10	15	15	15
10	20	20	15	15
11	10	5	10	10
12	5	5	5	5
13	5	5	5	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
1119	0	0	0	0
29	0	0	0	0

☒	0	15	30	45
1128	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
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41	0	0	0	0
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43	0	0	0	0
44	0	0	0	0
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46	0	0	0	0
47	0	0	0	0
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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	5
57	5	5	5	5
58	10	10	5	5
1158	5	0	0	0
59	5	0	0	0

SIGNATURE: Daniel R. Petrovay

VISIBLE EMISSIONS OBSERVATION FORM

DRIVER DANIEL R. PETROWAY

12-6-89

FACILITY SHENANGO STEEL INC.

OBSERVATION PERIOD: START: 0938-1008

FINISH: 1014-1044

OBSERVATION POINT: SOUTH OF STACK IN

TRUCK PARKING LOT

CE: #1 BATTERY STACK

DISTANCE FROM: 500 FT.

DIRECTION FROM: SOUTH

HEIGHT: 400 FT.

SPEED: 7 MPH

DIRECTION: SOUTH

TEMPERATURE: 41°

CONDITION: 100% OVERCAST

GROUND: Grey + White Clouds

WINDING CONDITIONS: fair To Good

TYPE OF EMISSIONS: BLACK

REMARKS: RUN #2

PERCENT OF READINGS ≥ 20%: 0

PERCENT OF READINGS ≥ 60%: 0

PERCENTAGE OPACITY: 0

REMARKS:

SIGNATURE: Daniel R. Petroway

☒	0	15	30	45
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
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21	0	0	0	0
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23	0	0	0	0
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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

☒	0	15	30	45
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	5
36	5	5	5	10
37	10	10	5	5
38	5	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 OBSERVATION FORM

OWNER DANIEL R. PETROUAY

DATE 12-5-84

PLANT SHENANDOAH STEEL INC.

OBSERVATION PERIOD: START: 1025-1055

FINISH: 1100-1130

OBSERVATION POINT: SOUTH OF STACK IN

LOCATION: PARKING LOT

SOURCE: #1 BATTERY STACK

DISTANCE FROM: 500 FT.

DIRECTION FROM: SOUTH

HEIGHT: 700 FT.

SPEED: 9 MPH

DIRECTION: WEST

TEMPERATURE: 34°

WEATHER CONDITION: 100% OVERCAST

BACKGROUND: Grey Skies

WINDING CONDITIONS: FAIR

COLOR OF EMISSIONS: BLACK

TESTS: RUN #1

PERCENT OF READINGS ≥ 20%: 4

PERCENT OF READINGS ≥ 60%: 0

SMOKE OPACITY: 1.25 %

REMARKS:

SIGNATURE: Daniel R. Petrouay

×	0	15	30	45
0	0	0	0	0
1	0	0	0	5
2	5	5	5	5
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	5	5	10	10
9	15	15	20	20
10	15	10	10	5
11	5	5	5	5
12	5	5	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	10
17	10	15	15	15
18	20	20	15	10
19	5	5	5	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

×	0	15	30	45
30	0	0	0	0
31	0	0	0	0
32	0	0	0	10
33	10	15	15	10
34	5	0	0	5
35	5	5	5	5
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	5
58	5	5	5	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATION FORM

RIVER DANIEL R. PETRUCCY
12-5-89

PLANT SHENANGO STEEL INC.

OBSERVATION PERIOD: START: 1134-1204

FINISH: 1218-24X

OBSERVATION POINT: SOUTH OF STACK IN

TOES PARKING LOT

CE: #1 BATTERY STACK

DISTANCE FROM: 500 FT.

DIRECTION FROM: SOUTH

HEIGHT: 400 FT.

SPEED: 17 MPH

DIRECTION: WEST

TEMPERATURE: 34°

CONDITION: 100% OVERCAST

GROUND: Grey Skies

WIND CONDITIONS: FAIR

TYPE OF EMISSIONS: BLACK

NOTES: RUN #1

IF READINGS ≥ 20%: 2

IF READINGS ≥ 60%: 0

PERCENTAGE OPACITY:

DATE:

SIGNATURE: Daniel R. Petruccy

☒	0	15	30	45
1134	0	0	10	10
1	10	15	15	15
2	20	15	15	15
3	10	10	10	5
4	5	5	5	5
5	5	5	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	5	5	10	10
12	10	10	10	5
13	5	5	5	5
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

☒	0	15	30	45
1218	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
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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	10	15	15	15
58	15	20	15	15
59	10	10	5	5

Shenguo

17-6-89

RUN NO.

3

TRAVERSE POINT NUMBER	ELAPSED SAMPLING TIME min	CLOCK TIME (24 hr. CLOCK)	GAS METER READING (V, I, H)	VELOCITY HEAD (Δp), in. H ₂ O	ORIFICE PRESSURE (ΔH), in. H ₂ O		STACK TEMPERATURE (T _s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PROBE TEMPERATURE, °F
					DESIRED	ACTUAL		INLET (T _m), °F	OUTLET (T _m), °F				
		1426	296.927				531	118	73	4	248	68	
	65	1431	301.2	.08	3.2	3.2	528	123	93	4	250	68	
1	70	1436	306.0	.08	3.2	3.2	535	127	93	4	272	66	
	75	1441	311.0	.10	3.5	3.5	553	128	97	4	272	66	
2	80	1446	316.3	.10	4.0	4.0	520	133	97	5	272	66	
	85	1451	321.7	.10	4.0	4.0	534	133	97	5	245	66	
3	90	1456	327.049	.10	4.0	4.0	547	117	97	5	239	65	
	95	1502	332.1	.095	3.7	3.7	552	133	97	5	252	61	
	100	1512	337.4	.095	3.7	3.7	543	137	97	5	260	59	
	105	1517	342.7	.10	4.0	4.0	554	137	98	5	268	56	
2	110	1522	349.0	.10	4.0	4.0	539	137	98	5	258	57	
	115	1527	353.1	.08	3.2	3.2	536	133	98	5	250	56	
3	120	1532	357.885	.08	3.2	3.2		501					
			118.260	.0829	3.40	3.40	541.3	104.4					

FIELD DATA

PLANT Shering
DATE 12-6-89
SAMPLING LOCATION Nail Battery STR
SAMPLE TYPE EPA-5
RUN NUMBER 3
OPERATOR Paul J. Gilmel
AMBIENT TEMPERATURE _____
BAROMETRIC PRESSURE 58.98 29.05
STATIC PRESSURE (P) 28.98
FILTER NUMBER (S) 142
PITOT TUBE NO. & CO. 7-1 0.84

PROBE LENGTH AND TYPE 7Ft 7-1 glass
NOZZLE I.D. .525
ASSUMED MOISTURE, % 1-1
SAMPLE BOX NUMBER —
METER BOX NUMBER 582-128
METER ΔH 1.993 $\gamma = 1.013$
K FACTOR .93
PRE-TEST LEAK CHECK RATE .018 CFM @ 15 "Hg
POST TEST LEAK CHECK RATE .025 CFM @ 11 "Hg
REFERENCE Δp .14

39.71

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 5 MINUTES

RAVERSE WT NUMBER	ELAPSED SAMPLING TIME min	CLOCK TIME (24 hr. CLOCK)	GAS METER READING (V. I. N3)	VELOCITY HEAD (ΔP), in. H ₂ O	ORIFICE PRESSURE (ΔH), in. H ₂ O		STACK TEMPERATURE (T _s), °F	DRY GAS METER		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PROBE TEMPERATURE, °F
					DESIRED	ACTUAL		INLET (T _{in}), °F	OUTLET (T _{out}), °F				
	0	1314	238.635										
	5	1319	243.9	.065	2.7	2.7	542	78	67	4	258	40	
1	10	1324	248.4	.065	2.7	2.7	552	93	68	4	260	42	
	15	1329	252.9	.07	2.9	2.9	543	103	73	4	268	48	
2	20	1334	257.5	.07	2.9	2.9	552	113	73	4	269	52	
	25	1339	262.0	.06	2.9	2.9	493	113	77	4	275	53	
3	30	1344	266.6	.06	2.9	2.9	536	117	78	4	254	56	
	35	1349 1354	271.1	.06	2.9	2.9	552	93	83	4	225	55	
1	40	1359	274.7	.06	2.9	2.9	553	117	83	4	248	66	
	45	1404	280.6	.09	3.6	3.6	555	123	87	4	249	65	
		1409	285.7	.09	3.6	3.6	545	127	87	4	268	67	
2	50	1414	290.9	.10	3.9	3.9	542	133	88	4	262	68	
	55	1419	296.116	.10	3.9	3.9	550	133	93	5	262	68	

PLANT Shiencingo

DATE 12-6-89

RUN NO.

2

[illegible]

EPA METHOD 75
FIELD DATA

PLANT Shenggo
DATE 12-6-89
SAMPLING LOCATION N2i Battery Stk
SAMPLE TYPE EPA-5
RUN NUMBER 2
OPERATOR Pavel Jadowski
AMBIENT TEMPERATURE _____
BAROMETRIC PRESSURE 28.96 29.03
STATIC PRESSURE, (P1) 28.96
FILTER NUMBER (S) 5141
PITOT TUBE No. & Co. 7-1 0.841

CO₂ - 6.0
5.5
5.0
O₂ 8.0
8.0
8.5

PROBE LENGTH AND TYPE 7 Ft 7-1 glass
NOZZLE I.D. 1.525
ASSUMED MOISTURE, % 14
SAMPLE BOX NUMBER _____
METER BOX NUMBER 582-128
METER ΔH₀ 1.943
K FACTOR .93
PRE-TEST LEAK CHECK RATE .012 CFM @ 15 "Hg
POST TEST LEAK CHECK RATE .021 CFM @ 11 "Hg
REFERENCE ΔP .044

SCHEMATIC OF TRAVERSE POINT LAYOUT

Moisture - 367.7
Pickup
READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE PT NUMBER	ELAPSED SAMPLING TIME min	CLOCK TIME (24 hr. CLOCK) 0937 0947	GAS METER READING (V ₁) m3 137.912	VELOCITY HEAD (ΔP _s) in. H ₂ O	ORIFICE PRESSURE DIFFERENTIAL (ΔH _i in. H ₂ O)		STACK TEMPERATURE (T _s) °F	DRY GAS METER TEMPERATURE		PUMP VACUUM in. Hg	SAMPLE BOX TEMPERATURE °F	IMPINGER TEMPERATURE °F	PROBE TEMPERATURE °F
					DESIRED	ACTUAL		INLET °F	OUTLET °F				
	5	0943	131.9	.055	2.3	2.3	540	58	57	5	273	34	248 ± 25
W 1	10	0947	135.8	.055	2.3	2.3	540	73	57	5	275	36	
	15	0952	140.1	.06	2.6	2.6	543	87	58	6	275	44	
2	20	0957	144.5	.06	2.6	2.6	553	88	63	6	275	38	
	25	1002	148.6	.055	2.3	2.3	425	93	67	5	274	52	
3	30	1007	153.7	.055	2.3	2.3	450	93	67	5	265	58	
	35	1013 1018	156.1	.04	1.7	1.7	550	73	67	5	252	54	
5 1	40	1023	159.7	.04	1.7	1.7	543	93	67	5	260	58	
	45	1028	164.3	.08	3.3	3.3	548	97	66	6	270	62	
2	50	1033	169.2	.08	3.3	3.3	557	103	73	6	265	63	
	55	1038	174.4	.09	3.8	3.8	532	107	73	6	240	65	
3	60	1043	179.8	.11	4.1	4.1	545	107	77	6	250	65	

PLANT _____ DATE 12-5-38 RUN NO. 1

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RUN NO. 1

[illegible]

FIELD DATA

PLANT Shenango
 DATE 12-5-89
 SAMPLING LOCATION N_a 1 Battery Stk
 SAMPLE TYPE EPA-6
 RUN NUMBER 1
 OPERATOR Paul Jadbawer
 AMBIENT TEMPERATURE 35°F
 BAROMETRIC PRESSURE 29.06 29.07
 STATIC PRESSURE, (P) 28.93 29.00
 FILTER NUMBER (s) 145
 PITOT TUBE No. & Cp. 7-1 0.84

PROBE LENGTH AND TYPE 7 Ft 7-1 glass
 NOZZLE I.D. .525
 ASSUMED MOISTURE, % 14
 SAMPLE BOX NUMBER 582-12 582-125
 METER BOX NUMBER 1.993
 METER ΔH₀ .93
 K FACTOR .93
 PRE-TEST LEAK CHECK RATE .017 CFM @ 15" Hg
 POST TEST LEAK CHECK RATE .015 CFM @ 11" Hg
 REFERENCE ΔP .044

Moisture Pickup - 378 ml

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	ELAPSED SAMPLING TIME, min	CLOCK TIME (24 hr. clock)	GAS METER READING (V, I, M)	VELOCITY HEAD (ΔP), in. H ₂ O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H ₂ O		STACK TEMPERATURE (T _s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PROBE TEMPERATURE, °F
					DESIRED	ACTUAL		INLET (T _m), °F	OUTLET (T _m), °F				
N	0	10:20	19.342	.0015	2.2	2.2	410	67	67	9	270	30	248
1	5	10:25	20.7	.002	2.2	2.2	410	71	71	9	271	31	↓
	10	10:30											
	15	10:35		.095	4.0	4.0	415	83	87	10	270	40	
2	20	10:40	21.0	.070	4.0	4.0	400	87	87	10	235	48	
	25	10:45	22.0	.07	3.8	3.8	400	93	91	9	225	48	
3	30	10:50	21.6	.035	2.2	2.2	410	93	91	10	230	58	
	35	10:55	21.6	.035	2.0	2.0	410	87	87	6	245	50	
4	40	11:00	21.1	.045	2.8	2.8	410	87	87	7	245	58	
	45	11:05	21.0	.07	2.2	2.2	410	87	87	10	235	54	
5	50	11:10	20.5	.07	2.8	2.8	410	91	88	10	230	58	
	55	11:15	20.1	.00	2.2	2.2	410	97	93	10	240	58	
6	60	11:20	21.4	.10	4.2	4.2	410	95	93	11	250	60	

APPENDIX A

FIELD DATA

TABLE 1

SUMMARY OF RESULTS

COKE OVEN BATTERY NO. 1 COMBUSTION STACK

Parameter	Run No. 1	Run No. 2	Run No. 3	Average
Gas Flow (ACFM)	93,390	92,288	97,551	94,410
Gas Flow (DSCFM)	40,805	40,774	42,835	41,471
Gas Temp. (°F)	551	535	535	540
Gas Moisture (%)	13.7	14.0	14.5	14.1
Isokinetic (%)	108.0	103.0	100.9	104.0
Part. Emission (gr/dscf)	0.0040	0.0060	0.0031	0.0044
Average Opacity (%)	1.8	0.9	0.9	1.2
Number of Readings >20% for 120 min. observation	6	4	0	3.3
Number of Readings >60% for 120 min. observation	0	0	0	0

1.564²/hr

3.0 PROCEDURES

The field sampling program was performed on December 5 and 6, 1989. The BCM test personnel consisted of Messrs. Paul Jadlovec, James Phillippi, and Daniel Petrovay. Mr. Bruce Earhardt served as plant coordinator.

3.1 FIELD WORK

All test and analytical procedures and field data sheets, including visual emissions data, are contained in Appendix A.

An exception to EPA Method 5 was the use of rubber tubing to connect the heated sample box with the glass impinger train.

3.2 ANALYSIS

All analytical data sheets and calculations are contained in Appendix B.

3.3 CALIBRATIONS

Field equipment calibrations are contained in Appendix C.

4.0 SUMMARY OF RESULTS

4.1 NO. 1 BATTERY COMBUSTION STACK

Table 1 presents a summary of the results of the particulate testing for No. 1 Battery Combustion Stack. The particulate grain loading ranged from 0.0031 gr/dscf to 0.0060 gr/dscf. The average of the three test runs was 0.0044 gr/dscf. The compliance limit was 0.015 gr/dscf. The average opacity during the three test runs was less than two percent.

1.0 EXECUTIVE SUMMARY

Shenango Incorporated retained BCM Engineers Inc. (BCM) to perform a particulate emission test on the Coke Oven Battery No. 1 Combustion Stack. Testing and analyses were conducted according to EPA Methods 1 through 5 and 9. The test results are to be used to demonstrate compliance with limitations set forth by the Allegheny County Health Department. The compliance limits and measured particulate emissions were as follows:

NO. 1 BATTERY

<u>Run No.</u>	<u>Compliance Limit</u>	<u>Measured Concentration</u>
1	0.015 gr/dscf	0.0040 gr/dscf
2	0.015 gr/dscf	0.0060 gr/dscf
3	0.015 gr/dscf	0.0031 gr/dscf
Avg.	0.015 gr/dscf	0.0044 gr/dscf

2.0 SCOPE AND OBJECTIVES

The scope of this project included the determination of the following parameters for each test run:

• Gas Flow	ACFM and DSCFM
• Gas Temperature	°F
• Gas Moisture	% by Volume
• Particulate Concentration	gr/dscf
• Opacity	%

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TABLE

Table 1	Summary of Results Coke Oven Battery No. 1 Combustion Stack	3
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PARTICULATE EVALUATION
OF
COKE OVEN BATTERY NO. 1 COMBUSTION STACK
AT

SHENANGO INCORPORATED
NEVILLE ISLAND PLANT
PITTSBURGH, PENNSYLVANIA 15225

BCM NO. 00-4810-30

DECEMBER 18, 1989

PREPARED BY:

Paul A. Jadowiec
PAUL A. JADLOWIEC
SECTION MANAGER

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PITTSBURGH, PENNSYLVANIA 15206