Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

USS
Clairton Works
400 State Street
Clairton, PA 15025

August 1, 1990

Director
Bureau of Air Quality Control
Department of Environmental Resources
Executive House-2nd & Chestnut
P.O. Box 2357
Harrisburg, PA 17105-2357

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

U. S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Office of Chief Council
Western Region
Department of Environmental Resources
1303 Highland Building
121 South Highland Avenue
Pittsburgh, Pennsylvania 15206

Gentlemen:

Subject: Compliance Demonstration
B Battery Pushing Emission Control System

Please find enclosed with this letter the final report on B Battery Pushing Emission Control System (Baghouse-Shed) compliance demonstration, conducted at USS Clairton Works, Division of USX Corporation, during the period March 12 -13, 1990.

Please refer questions concerning this report to Paul S. Kiswardy at (412) 233-1046.

Very truly yours,

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

GTW/BAC-nt
Attachments

RECEIVED
AUG 0 8 1990
Enforcement
State Coordination Section

RECEIVED
AUG 0 7 1990
AIR ENFORCEMENT BRANCH
EPA Region III

# UNITED STATES STEEL CORPORATION
# CLAIRTON COKE AND COAL
# CHEMICAL WORKS

# RESULTS OF THE
# COMPLIANCE DEMONSTRATION
# OF THE PUSHING EMISSIONS CONTROL
# FOR B-BATTERY

**Prepared for:**

**USS CLAIRTON WORKS**
**A DIVISION OF USX CORPORATION**
**CLAIRTON, PA**

**Prepared by:**

**KEYSTONE ENVIRONMENTAL RESOURCES, INC.**
**3000 TECH CENTER DRIVE**
**MONROEVILLE, PA 15146**

**PROJECT NO. 601000-15**

**APRIL 1990**

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

DCC#R667

# UNITED STATES STEEL CORPORATION
# CLAIRTON COKE AND COAL
# CHEMICAL WORKS

# RESULTS OF THE
# COMPLIANCE DEMONSTRATION
# OF THE PUSHING EMISSIONS CONTROL
# FOR B-BATTERY

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**3000 TECH CENTER DRIVE**
**MONROEVILLE, PA 15146**

**PROJECT NO. 601000-15**

**APRIL 1990**

DCC#R667

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## ABSTRACT

A compliance demonstration of the baghouse which controls the pushing emissions from the B-Battery operated by United States Steel Corporation Clairton Coke and Coal Chemical Works was conducted on March 12 and 13, 1990. Particulate matter sampling was performed in accordance with EPA Stationary Source Sampling Methods 1 through 5, Sections 139.11 and 139.12 of the DER Source Testing Manual, and Chapter 6 of the Allegheny County Bureau of Air Pollution Control Source Testing Manual. In addition, the presence of visible emissions from the baghouse stacks was recorded. Measurements of the opacity of the plumes which resulted from the pushing of coke were also recorded. The results of the testing showed that the particulate matter emissions rate was 3.799 lbs particles per hour, while the allowable L.A.E.R. emissions rate is 3.877 lbs particles per hour based on the L.A.E.R. standard of 0.04 lbs/ton coke pushed. Thus, the emissions from the baghouse are in compliance. No visible emissions from the 12 baghouse stacks were observed during any of the tests. The maximum plume opacity at the shed containment structure associated with the pushing of coke was less than 20% in nearly all cases (81.25% of the cases). On average, a plume opacity greater than or equal to 20% was observed for 2.38 seconds.

## 1.0 INTRODUCTION

As required by the amended Mon Valley Consent Decree (Paragraph V.A. (5)(f)) in accordance with the requirements set forth in Chapter 6, Chapter 20, and Section F of Chapter 18 of the Allegheny County Bureau of Air Pollution Control Source Testing Manual, a compliance demonstration of the pushing emissions control for the B-Battery operated by United States Steel Corporation Clairton Coke and Coal Chemical Works was conducted on March 12 and 13, 1990. A baghouse controls the emissions which result from the pushing operations from the ovens of B-Battery. The purpose of this testing was to (1) measure the particulate matter emissions rate from the exhaust of the baghouse and (2) compare the measured emissions rate to the allowable emissions rate. In addition, the presence of visible emissions from the baghouse stacks was recorded. Measurements of the opacity of the plume from the shed containment structure which resulted from the pushing of the coke were also recorded.

The determination of the particulate matter emissions was performed by the Air Quality Engineering Division (AQE) of Keystone Environmental Resources, Inc. (Keystone). The test crew was comprised of Mark Grunebach, Manager of the Monitoring Services Department of AQE, Daniel Keller, Thomas Morgan, John Shimshock, and Patrick Stockton of Keystone, and Rich Casselberry of The Chester Engineers (Chester). Visible emission measurements of the baghouse exhaust were recorded by Lance Grumling and Ken Kuiros of Chester. Plume opacities associated with the pushing operations were recorded by Rich Casselberry of Chester. All test procedures were witnessed by John Logan of the Allegheny County Health Department. Plume opacities were also recorded by the Allegheny County Health Department.

## 2.0 METHODOLOGIES

Particulate matter sampling was performed in accordance with EPA Stationary Source Sampling Methods 1 through 5 (EPA Stationary Source Sampling Methods Notebook, 1984) and Sections 139.11 and 139.12 of the Department of Environmental Resources (DER) of the Commonwealth of Pennsylvania Source Testing Manual (Revision Number 1, January 1983). The total gas volume sampled during each 2 hour test was greater than 50 dry standard cubic feet. Testing was performed only during periods of normal plant operation.
The exhaust from the baghouse exits through 12 of the 14 stacks of the module pulse jet unit. The emissions from twelve of these 48" diameter stacks were tested. Each traverse for the stack included 12 traverse points as calculated from EPA Stationary Source Sampling Method 1. Sampling was conducted along a total of 2 traverses, or 24 traverse points, with the gas exhaust sampled for 5 minutes at each traverse point. Sampling was conducted through 2 sampling ports which were separated by $90^{o}$.

A single test run was performed for 12 of the 14 stacks of the baghouse as specified in Chapter 20 of the Allegheny County Bureau of Air Pollution Control Source Testing Manual. During each test, gas concentrations of $CO_2$, $O_2$, and $N_2$ (by difference) were determined with the use of a Fyrite apparatus as specified by EPA Stationary Source Sampling Method 3.

Clean up of the sampling train included a water and acetone rinse of both the front-half and back-half components. The water soluble and water insoluble portions of the front-half of the sampling train were determined as a total, while the water soluble and water insoluble portions of the back-half were determined separately. The back-half water and the water soluble rinses of the back-half components of the sampling train were treated in accordance with Section 139.12 of the DER Source Testing Manual and Chapter 6 of the Allegheny County Bureau of Air Pollution Control Source Testing Manual.

## 3.0 RESULTS

All testing was performed during periods of normal plant operation. To validate this, copies of the circular charts which were used to record the underfiring gas volume, gas pressure, and stack draft for the B-Battery and the B-Battery temperatures can be found in Appendix A. Copies of the anticipated and actual pushing and charging schedule for B-Battery can be found in Appendix B.

### 3.1 Particulate Matter Emissions Rate

The probes and sampling trains were operated in accordance with EPA Stationary Source Sampling Methods 1 through 5. Copies of the pre-test calibration results, the post-test calibration results, and the results of the audit of the control boxes conducted with a critical orifice provided by the Allegheny County Health Department can be found in Appendix C. It should be noted that while the audit was being performed, there were large temperature variations (about 20$^{o}$F) within the laboratory.

Copies of the field data sheets for the particle sampling can be found in Appendix D. The emissions testing schedule is presented in Table 3-1. The emissions from modules 8, 9, 10, and 11 were tested simultaneously on March 12, 1990 (see Appendix D for a sketch of the module designation-number layout). There were several power outages during the first half of these tests. The total sampling time, however, was 2 hours. The emissions from modules 1, 3, 10, and 11 were tested simultaneously during the morning hours of March 13, 1990, while the emissions from modules 4, 5, 6, and 7 were tested simultaneously during the afternoon hours of March 13.

Copies of the emissions calculations for each test can be found in Appendix E. The results have been summarized in Tables 3-2, 3-3, and 3-4. The total particulate matter emissions rate was obtained by summing the emission rates from each module. These values are listed below:

**TABLE 3-1**

**PARTICULATE MATTER EMISSIONS TESTING SCHEDULE**

| TEST # | MODULE # | DATE TESTED |
|---|---|---|
| CLR-M8-1 | 8 | 3-12-90 |
| CLR-M9-1 | 9 | 3-12-90 |
| CLR-M10-1 | 10 | 3-12-90 |
| CLR-M11-1 | 11 | 3-12-90 |
| CLR-M1-1 | 1 | 3-13-90 |
| CLR-M3-1 | 3 | 3-13-90 |
| CLR-M12-1 | 12 | 3-13-90 |
| CLR-M14-1 | 14 | 3-13-90 |
| CLR-M4-1 | 4 | 3-13-90 |
| CLR-M5-1 | 5 | 3-13-90 |
| CLR-M6-1 | 6 | 3-13-90 |
| CLR-M7-1 | 7 | 3-13-90 |

**TABLE 3-2**

**PARTICULATE MATTER EMISSIONS DATA**
**DAY 1: MARCH 12, 1990**

| **EMISSIONS** | MODULE #8 | MODULE #9 | MODULE #10 | MODULE #11 |
|---|---|---|---|---|
| gr/scfd | 0.0012 | 0.0010 | 0.0012 | 0.0019 |
| lb/hr | 0.251 | 0.198 | 0.221 | 0.428 |
| **STACK CONDITIONS** | | | | |
| Flow (acfm) | 27203 | 26054 | 24977 | 30901 |
| Flow (scfm) | 24132 | 23185 | 22256 | 27037 |
| Moisture Content (%) | 1.61 | 1.75 | 1.73 | 1.75 |
| Stack Temp. ($^{o}$F) | 125 | 123 | 122 | 133 |
| **SAMPLING CONDITIONS** | | | | |
| Sampling Time (min) | 120 | 120 | 120 | 120 |
| Sample Volume (scfd) | 57.454 | 65.176 | 61.482 | 53.278 |
| Isokinetics (%) | 106.37 | 102.06 | 96.09 | 95.32 |

**TABLE 3-3**

**PARTICULATE MATTER EMISSIONS DATA**
**DAY 2: MARCH 13, 1990**

| EMISSIONS | MODULE #1 | MODULE #3 | MODULE #12 | MODULE #14 |
|---|---|---|---|---|
| gr/scfd | 0.0014 | 0.0012 | 0.0010 | 0.0018 |
| lb/hr | 0.336 | 0.302 | 0.220 | 0.379 |
| **STACK CONDITIONS** | | | | |
| Flow (acfm) | 33091 | 34611 | 28306 | 28008 |
| Flow (scfm) | 28972 | 30792 | 25411 | 25047 |
| Moisture Content (%) | 2.07 | 1.87 | 2.17 | 2.37 |
| Stack Temp. ($^{o}$F) | 136 | 127 | 121 | 124 |
| **SAMPLING CONDITIONS** | | | | |
| Sampling Time (min) | 120 | 120 | 120 | 120 |
| Sample Volume (scfd) | 61.230 | 83.279 | 77.514 | 54.528 |
| Isokinetics (%) | 94.86 | 98.31 | 106.59 | 105.97 |

## TABLE 3-4

## PARTICULATE MATTER EMISSIONS DATA
## DAY 2: MARCH 13, 1990

| EMISSIONS | MODULE #4 | MODULE #5 | MODULE #6 | MODULE #7 |
|---|---|---|---|---|
| gr/scfd | 0.0013 | 0.0025 | 0.0013 | 0.0014 |
| lb/hr | 0.335 | 0.514 | 0.276 | 0.339 |
| **STACK CONDITIONS** | | | | |
| Flow (acfm) | 34955 | 28121 | 30160 | 32167 |
| Flow (scfm) | 30075 | 24242 | 26041 | 28459 |
| Moisture Content (%) | 1.09 | 2.25 | 2.06 | 1.76 |
| Stack Temp. ($^{o}$F) | 147 | 145 | 144 | 130 |
| **SAMPLING CONDITIONS** | | | | |
| Sampling Time (min) | 120 | 120 | 120 | 120 |
| Sample Volume (scfd) | 82.031 | 51.707 | 54.961 | 78.321 |
| Isokinetics (%) | 98.37 | 95.91 | 102.41 | 95.75 |

| Module # | Particulate Matter Emissions Rate (lbs / hr) |
|---|---|
| 1 | 0.336 |
| 3 | 0.302 |
| 4 | 0.335 |
| 5 | 0.514 |
| 6 | 0.276 |
| 7 | 0.339 |
| 8 | 0.251 |
| 9 | 0.198 |
| 10 | 0.221 |
| 11 | 0.428 |
| 12 | 0.220 |
| 14 | 0.379 |
| Total | 3.799 |

The particulate matter emission rate is 3.799 lbs per hour. The allowable particulate matter emissions rate is equal to 0.04 lbs particles per ton of coke pushed. Since there were on average 24.23 tons of coke per oven, and on average 4 ovens were pushed per hour, the particulate matter emissions rate is equal to (0.04 lbs particles/ton coke pushed) x (24.23 tons coke pushed/oven) x (4 ovens pushed/hour), or 3.877 lbs per hour. Thus, the particulate matter emissions from the baghouse are in compliance.

### 3.2 Analysis of the Filtered Back-Half Water and Water Soluble Rinses of the Back-Half Components

The analysis of the filtered back-half water solutions and the water soluble rinses of the back-half components of the sampling train was performed in accordance with the Allegheny County Bureau of Air Pollution Control Source Testing Manual, Chapter 6, Item 11. The sulfate ion concentration was determined by the Barium-Thornin method as outlined by EPA Method 6. The analytical results can be found in Appendix F. The weights of sulfate collected and the sulfate emission rates for each test performed are listed below:

| Module # | Weight of $SO_4^{=}$ (g) | $SO_4^{=}$ Emission Rate (mg/dscm) |
|---|---|---|
| 1 | 0.0030 | 1.73 |
| 3 | 0.0008 | 0.34 |
| 4 | 0.0029 | 1.25 |
| 5 | 0.0096 | 6.56 |
| 6 | 0.0005 | 0.32 |
| 7 | 0.0012 | 0.54 |
| 8 | 0.0015 | 0.92 |
| 9 | 0.0014 | 0.76 |
| 10 | 0.0009 | 0.52 |
| 11 | 0.0017 | 1.13 |
| 12 | 0.0009 | 0.41 |
| 14 | 0.0021 | 1.36 |

### 3.3 Opacity Measurements

The presence of visible emissions from the baghouse stacks and opacity measurements of the plumes from the pushing control shed associated with the pushing of coke were also recorded. Copies of the field data sheets can be found in Appendix G. This data has been summarized in Table 3-5. No visible emissions were observed from any of the baghouse stacks during any of the tests. A pushing performance of 100% was registered if the maximum plume opacity observed during the pushing operation was less than 20%. A pushing performance of 0% was registered if the maximum plume opacity was greater than or equal to 20%. The average pushing performance determined over both days of testing was 81.25%. During the pushing operation, the plume opacity was greater than or equal to 20% for an average of 2.38 seconds.

## TABLE 3-5

## PLUME OPACITY DATA

| Date | Number of Observations | Number of Observations with Opacity <20% | Average Pushing Performance (%) | Average Time With Opacity >=20% (sec) |
|---|---|---|---|---|
| 3-12-90 | 11 | 10 | 90.91 | 0.45 |
| 3-13-90 | 21 | 16 | 76.19 | 3.38 |
| Average | | | 81.25 | 2.38 |

## 4.0 CONCLUSIONS

The results of a compliance demonstration of the pushing emissions control for B-Battery operated by United States Steel Corporation Clairton Coke and Coal Chemical Works can be summarized as the following:

(1) The average particulate matter emissions rate was 3.799 lbs particles per hour. The allowable emissions rate is 3.877 lbs particles per hour. Thus, the emissions from the baghouse are in compliance.

(2) No visible emissions from the baghouse stacks were observed during any of the tests.

(3) The maximum plume opacity associated with the pushing of coke was less than 20% in nearly all cases (81.25% of the cases). On average, a plume opacity greater than or equal to 20% was observed for 2.38 seconds.

# APPENDIX A

# OPERATIONAL RECORDS FOR B-BATTERY

"B" BATTERY TEMPS.

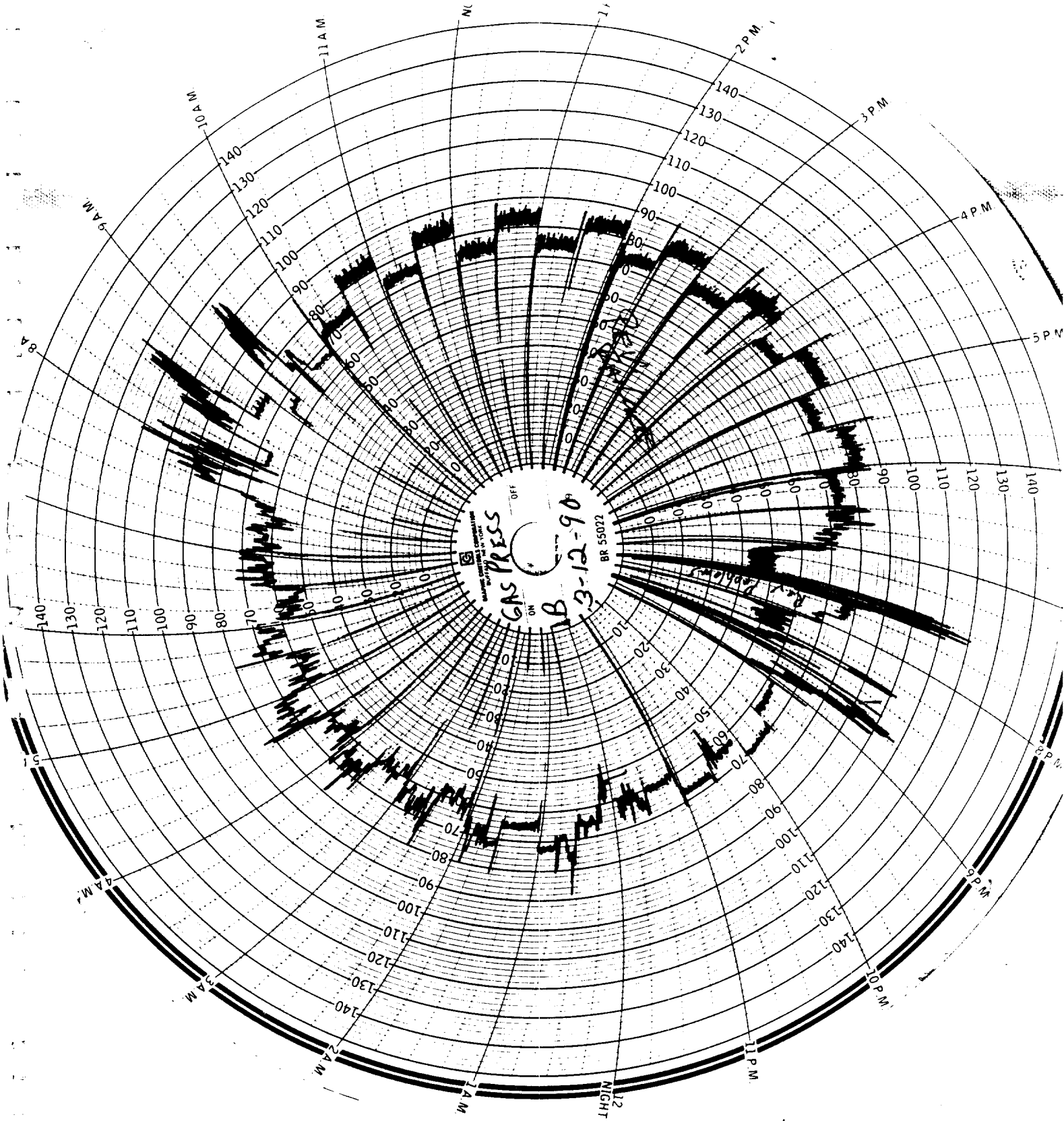
| PUSHER SIDE | | | | COKE SIDE | | | |
|---|---|---|---|---|---|---|---|
| | Soot | Min. | Cal. | Horiz. | | Soot | Min. | Cal. | Horiz. |
| A1 | 360 | | (500) | | A1 | 440 | 115 | (550) | |
| A3 | 260 | | 400 | | A3 | 340 | | 455 | |
| A5 | 290 | | 430 | | A5 | 360 | | 475 | |
| A7 | 290 | | 430 | | A7 | 370 | | 485 | |
| A9 | 310 | | 450 | | A9 | 380 | | 495 | |
| A11 | 300 | | 440 | | A11 | 400 | | 515 | |
| A13 | 260 | | 400 | | A13 | 360 | | 475 | |
| A15 | 290 | | 430 | | A15 | 350 | 120 | 470 | |
| A17 | 280 | 140 | 420 | | A17 | 340 | | 460 | |
| A19 | 300 | | 435 | | A19 | 350 | | 470 | |
| A21 | 310 | | 445 | | A21 | 360 | | 460 | |
| A23 | 270 | | 405 | | A23 | | | | |
| A25 | 300 | | 435 | | A25 | | | | |
| A27 | 310 | | 445 | | A27 | | | | |
| A29 | 320 | | 455 | | A29 | 360 | | 480 | |
| A31 | 310 | | 445 | | A31 | 360 | | 480 | |
| A33 | 300 | | 435 | | A33 | 340 | 125 | 465 | |
| A35 | 320 | | 455 | | A35 | 360 | | 485 | |
| A37 | 290 | 135 | 425 | | A37 | 340 | | 465 | |
| A's PS Avg. | | | 2432 | | A's CS Avg. | | | 2475 | |
| B1 | 300 | | 430 | | B1 | 370 | | 495 | |
| B3 | 270 | | 400 | | B3 | 330 | | 455 | |
| B5 | 290 | | 420 | | B5 | 330 | | 455 | |
| B7 | 300 | | 430 | | B7 | 320 | 130 | 450 | |
| B9 | 270 | | 400 | | B9 | 340 | | 470 | |
| B11 | 300 | 130 | 430 | | B11 | 370 | | 500 | |
| B13 | 280 | | 405 | | B13 | 350 | | 480 | |
| B15 | 300 | | 425 | | B15 | 380 | | 510 | |
| B17 | 320 | | 445 | | B17 | 370 | | 500 | |
| B19 | 310 | | 435 | | B19 | 380 | | 510 | |
| B21 | 230 | | 355 | | B21 | 340 | 135 | 475 | |
| B23 | 250 | | 375 | | B23 | 300 | | 435 | |
| B25 | 290 | | 415 | | B25 | 340 | | 475 | |
| B27 | 270 | 125 | 395 | | B27 | 320 | | 455 | |
| B29 | 300 | | 420 | | B29 | 350 | | 485 | |
| B31 | 260 | | 380 | | B31 | 290 | | 425 | |
| B33 | 270 | | 390 | | B33 | 290 | | 425 | |
| B35 | 290 | | 410 | | B35 | 320 | | 455 | |
| B37 | 250 | | 370 | | B37 | 290 | | 425 | |
| B38 | 260 | 120 | (380) | | B38 | 220 | | (550) | |
| B's PS Avg. | | | 2408 | | B's CS Avg. | | | 2467 | |

P.S.Flue Avg. 2420 C.S.Flue Avg. 2471 Flue Avg. 2445

P.S.Horiz. Avg. _____ C.S.Horiz. Avg. _____ Horiz.Avg. _____

DATE 3-11-90 TURN 12-8

432
19 | 7780
72
58
54
40
408
19 | 7750
76
15
475
15 | 7135
60
113
105
8
467
19 | 8880
76
125
114
17
475
467
471
2 | 942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ON
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BR 55022
3-12-90
2 P.M.
3 P.M.
4 P.M.
5 P.M.
8 P.M.
9 P.M.
10 P.M.
11 P.M.
12 NIGHT
1 A.M.
2 A.M.
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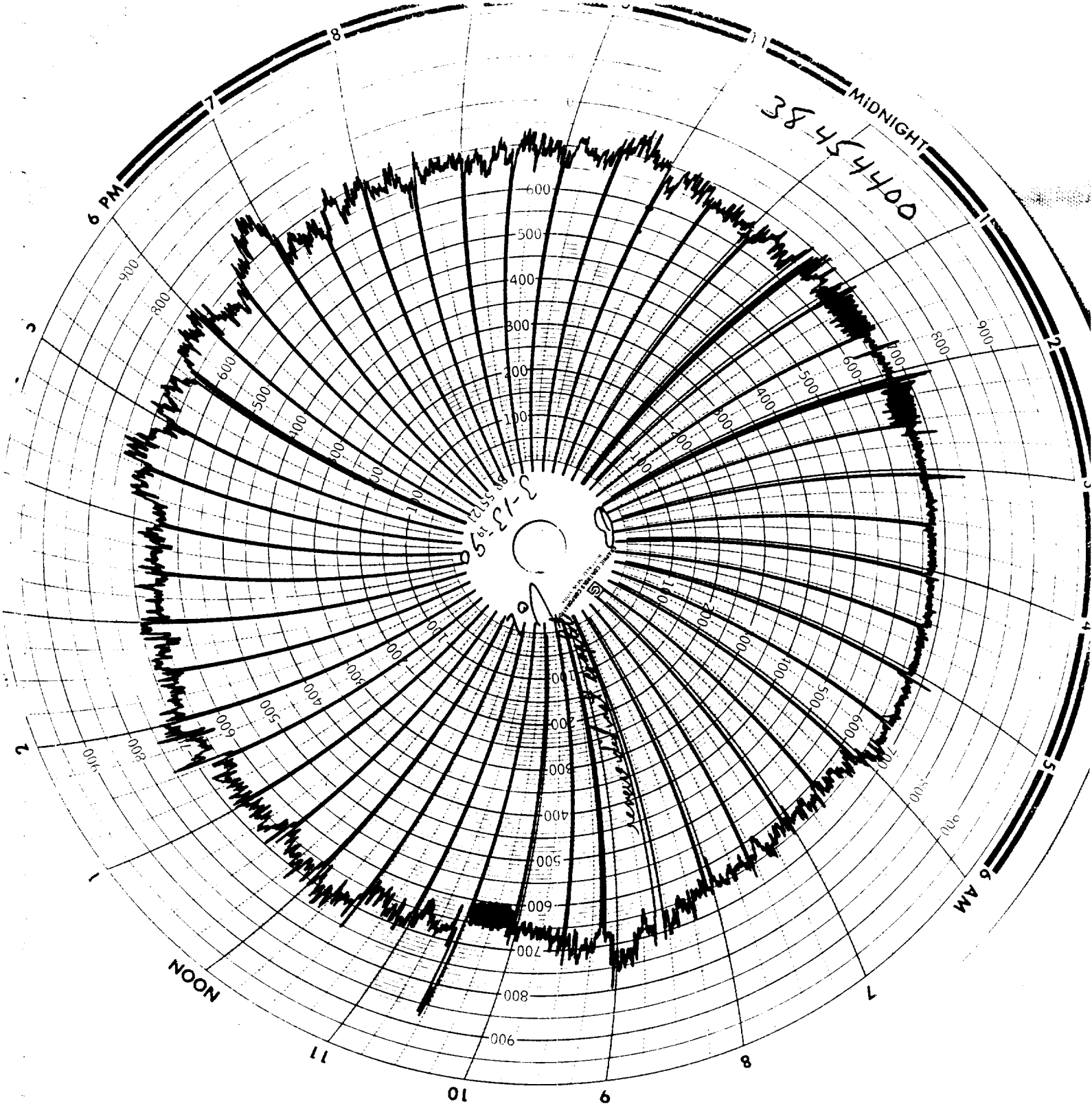
5 A.M.
8 A.M.
9 A.M.
10 A.M.
11 A.M.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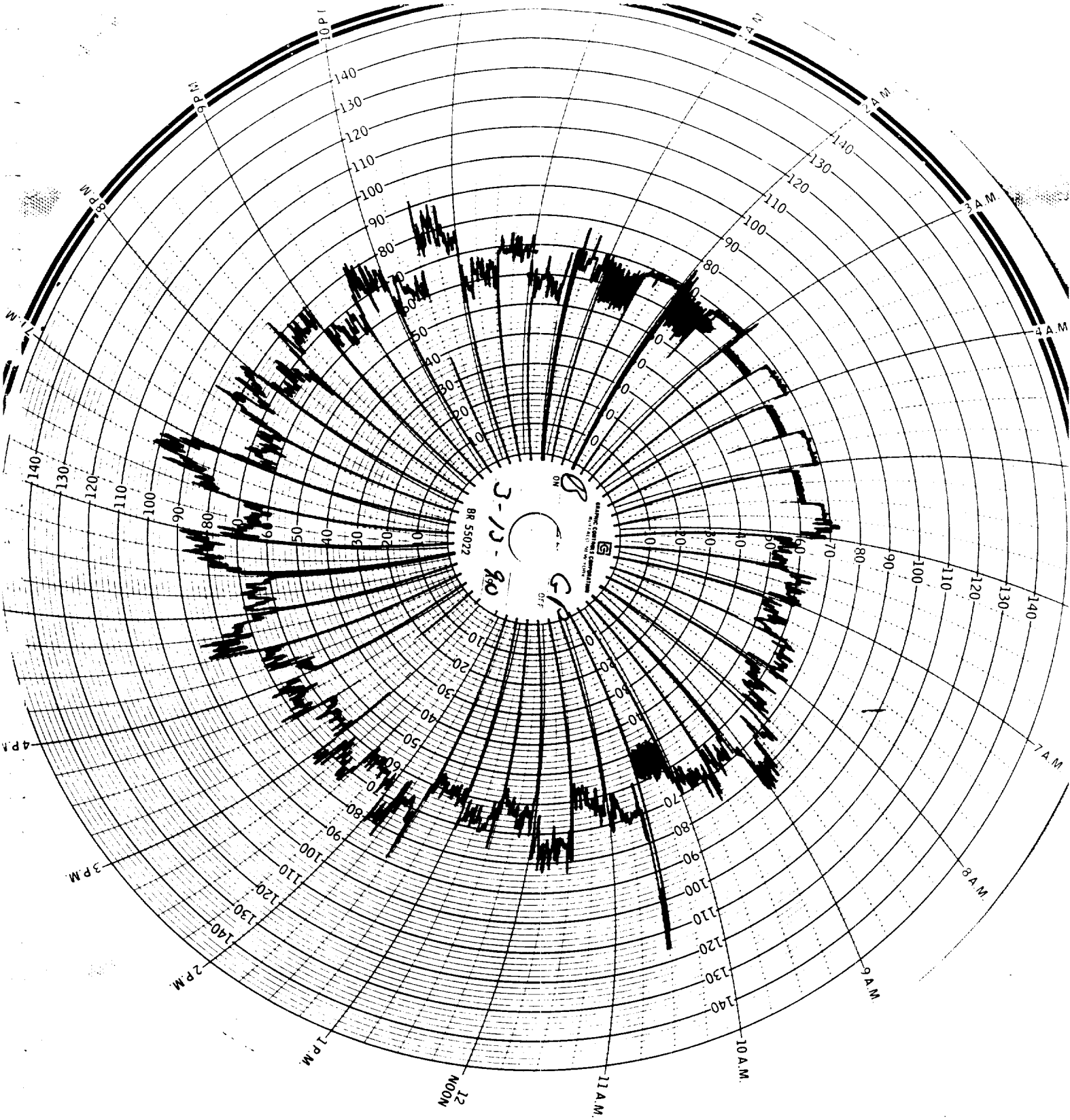
6 AM
NOON
6 PM
38-454400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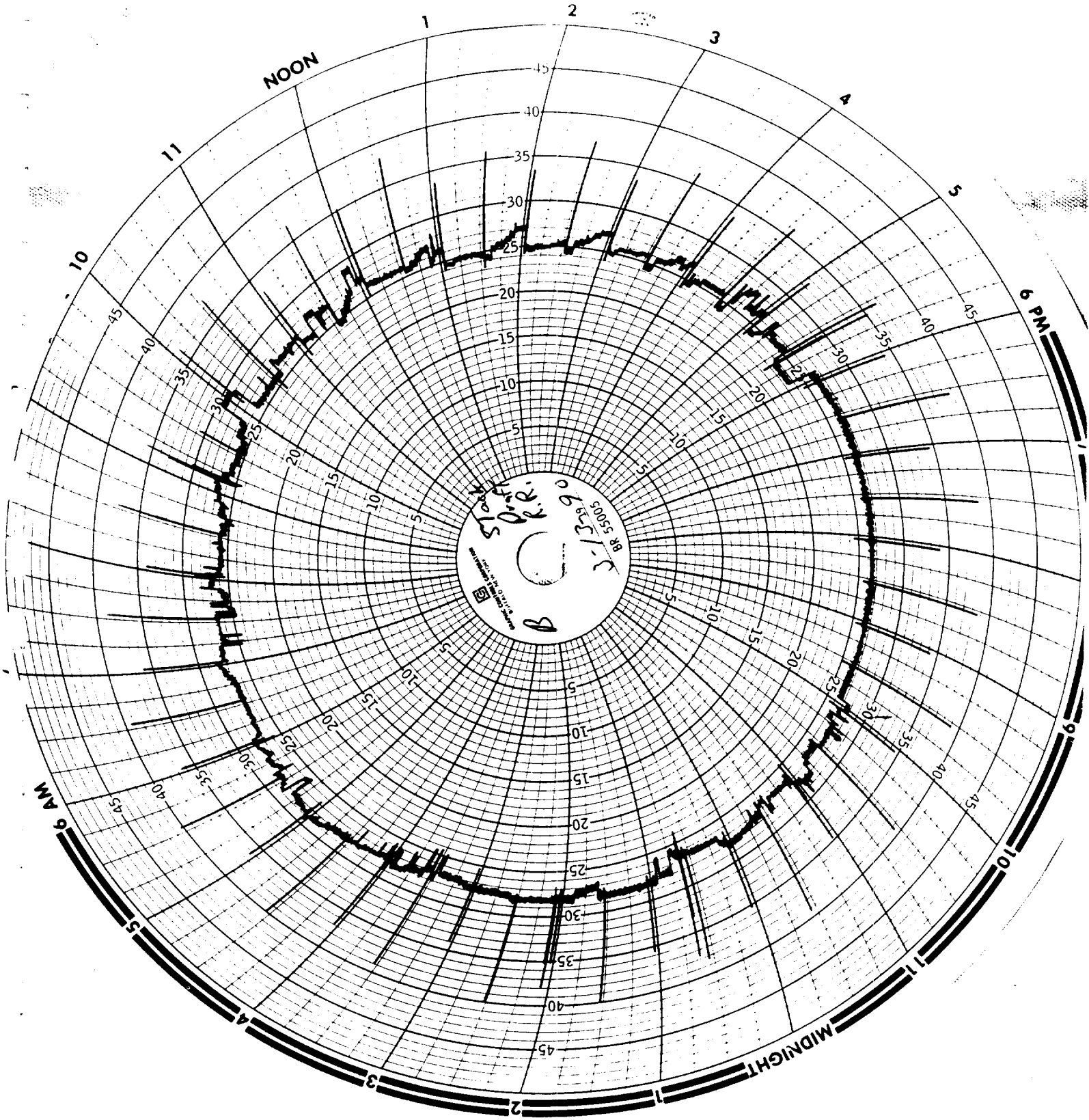
2 P.M.
3 P.M.
4 P.M.
7 A.M.
8 A.M.
9 A.M.
10 A.M.
11 A.M.
ON
OFF
BR 55022


NOON
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MIDNIGHT
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5
6 AM
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8
9
10
11
45
40
35
30
25
20
15
10
5
BR 55005

# "B" BATTERY TEMPS.

| PUSHER SIDE | Soot | Min. | Cal. | Horiz. | COKE SIDE | Soot | Min. | Cal. | Horiz. |
|---|---|---|---|---|---|---|---|---|---|
| A1 | 360 | 130 | 490 | | A1 | 410 | 120 | 530 | |
| A3 | 320 | | 450 | | A3 | 350 | | 470 | |
| A5 | 330 | | 460 | | A5 | 390 | | 510 | |
| A7 | 320 | | 450 | | A7 | 400 | | 520 | |
| A9 | 310 | | 440 | | A9 | 360 | | 480 | |
| A11 | 310 | | 440 | | A11 | 410 | | 530 | |
| A13 | 310 | | 440 | | A13 | 410 | | 530 | |
| A15 | 300 | | 430 | | A15 | 370 | | 490 | |
| A17 | 300 | | 430 | | A17 | 350 | | 470 | |
| A19 | 280 | | 410 | | A19 | 360 | 125 | 485 | |
| A21 | 330 | 135 | 465 | | A21 | 360 | | 485 | |
| A23 | 300 | | 435 | | A23 | 400 | | 525 | |
| A25 | 300 | | 435 | | A25 | 350 | | 475 | |
| A27 | 310 | | 445 | | A27 | 400 | | 525 | |
| A29 | 300 | | 435 | | A29 | 370 | | 495 | |
| A31 | 330 | | 465 | | A31 | 380 | | 505 | |
| A33 | 310 | | 445 | | A33 | 390 | | 515 | |
| A35 | 320 | | 455 | | A35 | 400 | | 525 | |
| A37 | 300 | | 435 | | A37 | 360 | 130 | 490 | |
| A's PS Avg. 2442 | | | | | A's CS Avg. 2501 | | | | |
| B1 | 280 | | 415 | | B1 | 360 | | 490 | |
| B3 | 290 | | 425 | | B3 | 360 | | 490 | |
| B5 | 290 | | 425 | | B5 | 340 | | 470 | |
| B7 | 270 | 140 | 410 | | B7 | 360 | | 490 | |
| B9 | 290 | | 430 | | B9 | 360 | | 490 | |
| B11 | 300 | | 440 | | B11 | 360 | | 490 | |
| B13 | 310 | | 450 | | B13 | 360 | | 490 | |
| B15 | 320 | | 460 | | B15 | 380 | 135 | 515 | |
| B17 | 310 | | 450 | | B17 | 390 | | 525 | |
| B19 | 300 | | 440 | | B19 | 350 | | 485 | |
| B21 | 260 | | 400 | | B21 | 340 | | 475 | |
| B23 | 260 | | 400 | | B23 | 340 | | 475 | |
| B25 | 270 | 145 | 415 | | B25 | 360 | | 495 | |
| B27 | 250 | | 395 | | B27 | 340 | | 475 | |
| B29 | 250 | | 395 | | B29 | 330 | | 465 | |
| B31 | 260 | | 405 | | B31 | 360 | | 495 | |
| B33 | 250 | | 395 | | B33 | 340 | | 475 | |
| B35 | 260 | | 405 | | B35 | 340 | | 475 | |
| B37 | 250 | | 395 | | B37 | 320 | | 455 | |
| B38 | 240 | | 385 | | B38 | 250 | | 385 | |
| B's PS Avg. 2418 | | | | | B's CS Avg. 2485 | | | | |

442
18)7965
72
76
72
45
418
19)7950
76
35
19
160

418
442
430
2)850

501
18)9025
90

485
19)9220
76
162
152
100

501
485
493
2)986

430
493
461
2)923

3/13/90

# APPENDIX B

## ANTICIPATED AND ACTUAL PUSHING AND CHARGING SCHEDULE FOR B-BATTERY

# PUSHING SCHEDULE FOR BATTERY B

| SEQ # | PUSH | CHARGE | EARLIEST TIME | DESIRED TIME | LATEST TIME | PM |
|---|---|---|---|---|---|---|
| 1 | A 9 | A 4 | 11:50 | 12: 0 | 12:25 | 1 |
| 2 | B 9 | B 4 | 12: 4 | 12:14 | 12:39 | 1 |
| 3 | A14 | A 9 | 12:18 | 12:28 | 12:53 | 1 |
| 4 | B14 | B 9 | 12:32 | 12:42 | 1: 7 | 1 |
| 5 | A19 | A14 | 12:46 | 12:56 | 1:21 | 1 |
| 6 | B19 | B14 | 1: 0 | 1:10 | 1:35 | 1 |
| 7 | A24 | A19 | 1:14 | 1:24 | 1:49 | 1 |
| 8 | B24 | B19 | 1:28 | 1:38 | 2: 3 | 1 |
| 9 | A29 | A24 | 1:42 | 1:52 | 2:17 | 1 |
| 10 | B29 | B24 | 1:57 | 2: 7 | 2:32 | 1 |
| 11 | A34 | A29 | 2:11 | 2:21 | 2:46 | 1 |
| 12 | B34 | B29 | 2:25 | 2:35 | 3: 0 | 1 |
| 13 | A 1 | A34 | 2:39 | 2:49 | 3:14 | 1 |
| 14 | B 1 | B34 | 2:53 | 3: 3 | 3:28 | 1 |
| 15 | A 6 | A 1 | 3: 7 | 3:17 | 3:42 | 1 |
| 16 | B 6 | B 1 | 3:21 | 3:31 | 3:56 | 1 |
| 17 | A11 | A 6 | 3:35 | 3:45 | 4:10 | 1 |
| 18 | B11 | B 6 | 3:50 | 4: 0 | 4:25 | 1 |
| 19 | A16 | A11 | 4: 4 | 4:14 | 4:39 | 1 |
| 20 | B16 | B11 | 4:18 | 4:28 | 4:53 | 1 |
| 21 | A21 | A16 | 4:32 | 4:42 | 5: 7 | 1 |
| 22 | B21 | B16 | 4:46 | 4:56 | 5:21 | 1 |
| 23 | A26 | A21 | 5: 0 | 5:10 | 5:35 | 1 |
| 24 | B26 | B21 | 5:14 | 5:24 | 5:49 | 1 |
| 25 | A31 | A26 | 5:28 | 5:38 | 6: 3 | 1 |
| 26 | B31 | B26 | 5:42 | 5:52 | 6:17 | 1 |
| 27 | A36 | A31 | 5:57 | 6: 7 | 6:32 | 1 |
| 28 | B36 | B31 | 6:11 | 6:21 | 6:46 | 1 |
| 29 | A 3 | A36 | 6:25 | 6:35 | 7: 0 | 1 |
| 30 | B 3 | B36 | 6:39 | 6:49 | 7:14 | 1 |
| 31 | A 8 | A 3 | 6:53 | 7: 3 | 7:28 | 1 |
| 32 | B 8 | B 3 | 7: 7 | 7:17 | 7:42 | 1 |
| 33 | A13 | A 8 | 7:21 | 7:31 | 7:56 | 1 |
| 34 | B13 | B 8 | 7:35 | 7:45 | 8:10 | 1 |

SUN MAR 11 1990 12X 8 TURN

# PUSHING SCHEDULE FOR BATTERY B

| SEQ # | PUSH | CHARGE | EARLIEST TIME | DESIRED TIME | LATEST TIME | PM |
|---|---|---|---|---|---|---|
| 1 | A18 | A13 | 7:50 | 8: 0 | 8:25 | 1 |
| 2 | B18 | B13 | 8: 5 | 8:15 | 8:40 | 1 |
| 3 | A23 | A18 | 8:20 | 8:30 | 8:55 | 1 |
| 4 | B23 | B18 | 8:35 | 8:45 | 9:10 | 1 |
| 5 | A28 | A23 | 8:50 | 9: 0 | 9:25 | 1 |
| 6 | B28 | B23 | 9: 5 | 9:15 | 9:40 | 1 |
| 7 | A33 | A28 | 9:20 | 9:30 | 9:55 | 1 |
| 8 | B33 | B28 | 9:35 | 9:45 | 10:10 | 1 |
| 9 | A38 | A33 | 9:50 | 10: 0 | 10:25 | 1 |
| 10 | A 5 | B33 | 10: 5 | 10:15 | 10:40 | 1 |
| 11 | B 5 | A38 | 10:20 | 10:30 | 10:55 | 1 |
| 12 | A10 | A 5 | 10:35 | 10:45 | 11:10 | 1 |
| 13 | B10 | B 5 | 10:50 | 11: 0 | 11:25 | 1 |
| 14 | A15 | A10 | 11: 5 | 11:15 | 11:40 | 1 |
| 15 | B15 | B10 | 11:20 | 11:30 | 11:55 | 1 |
| 16 | A20 | A15 | 11:35 | 11:45 | 12:10 | 1 |
| 17 | B20 | B15 | 11:50 | 12: 0 | 12:25 | 1 |
| 18 | A25 | A20 | 12: 5 | 12:15 | 12:40 | 1 |
| 19 | B25 | B20 | 12:20 | 12:30 | 12:55 | 1 |
| 20 | A30 | A25 | 12:35 | 12:45 | 1:10 | 1 |
| 21 | B30 | B25 | 12:50 | 1: 0 | 1:25 | 1 |
| 22 | A35 | A30 | 1: 5 | 1:15 | 1:40 | 1 |
| 23 | B35 | B30 | 1:20 | 1:30 | 1:55 | 1 |
| 24 | A 2 | A35 | 1:35 | 1:45 | 2:10 | 1 |
| 25 | B 2 | B35 | 1:50 | 2: 0 | 2:25 | 1 |
| 26 | A 7 | A 2 | 2: 5 | 2:15 | 2:40 | 1 |
| 27 | B 7 | B 2 | 2:20 | 2:30 | 2:55 | 1 |
| 28 | A12 | A 7 | 2:35 | 2:45 | 3:10 | 1 |
| 29 | B12 | B 7 | 2:50 | 3: 0 | 3:25 | 1 |
| 30 | A17 | A12 | 3: 5 | 3:15 | 3:40 | 1 |
| 31 | B17 | B12 | 3:20 | 3:30 | 3:55 | 1 |
| 32 | A22 | A17 | 3:35 | 3:45 | 4:10 | 1 |

SUN MAR 11 1990 8X 4 TURN

# PUSHING SCHEDULE FOR BATTERY B

| SEQ # | PUSH | CHARGE | EARLIEST TIME | DESIRED TIME | LATEST TIME | PM |
|---|---|---|---|---|---|---|
| 1 | B22 | B17 | 3:50 | 4: 0 | 4:25 | 1 |
| 2 | A27 | A22 | 4: 4 | 4:14 | 4:39 | 1 |
| 3 | B27 | B22 | 4:18 | 4:28 | 4:53 | 1 |
| 4 | A32 | A27 | 4:32 | 4:42 | 5: 7 | 1 |
| 5 | B32 | B27 | 4:46 | 4:56 | 5:21 | 1 |
| 6 | A37 | A32 | 5: 0 | 5:10 | 5:35 | 1 |
| 7 | B37 | B32 | 5:14 | 5:24 | 5:49 | 1 |
| 8 | A 4 | A37 | 5:28 | 5:38 | 6: 3 | 1 |
| 9 | B 4 | B37 | 5:42 | 5:52 | 6:17 | 1 |
| 10 | A 9 | A 4 | 5:57 | 6: 7 | 6:32 | 1 |
| 11 | B 9 | B 4 | 6:11 | 6:21 | 6:46 | 1 |
| 12 | A14 | A 9 | 6:25 | 6:35 | 7: 0 | 1 |
| 13 | B14 | B 9 | 6:39 | 6:49 | 7:14 | 1 |
| 14 | A19 | A14 | 6:53 | 7: 3 | 7:28 | 1 |
| 15 | B19 | B14 | 7: 7 | 7:17 | 7:42 | 1 |
| 16 | A24 | A19 | 7:21 | 7:31 | 7:56 | 1 |
| 17 | B24 | B19 | 7:35 | 7:45 | 8:10 | 1 |
| 18 | A29 | A24 | 7:50 | 8: 0 | 8:25 | 1 |
| 19 | B29 | B24 | 8: 4 | 8:14 | 8:39 | 1 |
| 20 | A34 | A29 | 8:18 | 8:28 | 8:53 | 1 |
| 21 | B34 | B29 | 8:32 | 8:42 | 9: 7 | 1 |
| 22 | A 1 | A34 | 8:46 | 8:56 | 9:21 | 1 |
| 23 | B 1 | B34 | 9: 0 | 9:10 | 9:35 | 1 |
| 24 | A 6 | A 1 | 9:14 | 9:24 | 9:49 | 1 |
| 25 | B 6 | B 1 | 9:28 | 9:38 | 10: 3 | 1 |
| 26 | A11 | A 6 | 9:42 | 9:52 | 10:17 | 1 |
| 27 | B11 | B 6 | 9:57 | 10: 7 | 10:32 | 1 |
| 28 | A16 | A11 | 10:11 | 10:21 | 10:46 | 1 |
| 29 | B16 | B11 | 10:25 | 10:35 | 11: 0 | 1 |
| 30 | A21 | A16 | 10:39 | 10:49 | 11:14 | 1 |
| 31 | B21 | B16 | 10:53 | 11: 3 | 11:28 | 1 |
| 32 | A26 | A21 | 11: 7 | 11:17 | 11:42 | 1 |
| 33 | B26 | B21 | 11:21 | 11:31 | 11:56 | 1 |
| 34 | A31 | A26 | 11:35 | 11:45 | 12:10 | 1 |

SUN MAR 11 1990 4X12 TURN

**UNITED STATES STEEL CORPORATION**
**CLAIRTON WORKS**

FOREMEN ON DUTY

HOURLY OPERATION OF BATTERIES

DATE 3-11-90

| FOREMAN | | 12 M. - 8 A.M. | 8 A.M. - 4 P.M. | 4 P.M. - 12 M. |
|---|---|---|---|---|
| | Batteries ~~1-2-3~~ B | Sanders | Smith | Shelton |
| | Batteries 4-5-6 | | | |
| | Relief 1 to 6 | | | |
| | Batteries 7-8-9 | | | |
| | Batteries 10-11-12 | | | |
| | Relief 7 to 12 | | | |
| | Batteries 13-14-15 | | | |
| | Batteries 16-17-18 | | | |
| | Relief 13 to 18 | | | |
| | Batteries 19-20 | | | |
| | Batteries 21-22 | | | |
| | Relief 19 to 22 | | | |

| | Batt. 1-2-3 | | | Batt. 4-5-6 | | | Batt. 7-8-9 | | | Batt. 10-11-12 | | | Batt. 13-14-15 | | | Batt. 16-17-18 | | | Batt. 19-20 | | | Batt. 21-22 | | | Batt. 72-A | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S |
| 12- 1 A.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1- 2 A.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2- 3 A.M. | 4 | 4 | | 34 | | | | | | | | | | | | | | | | | | | | | | | |
| 3- 4 A.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4- 5 A.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5- 6 A.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6- 7 A.M. | 4 | 4 | | | | 34 | | | | | | | | | | | | | | | | | | | | | |
| 7- 8 A.M. | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8- 9 A.M. | 2 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9-10 A.M. | 5 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10-11 A.M. | 4 | 4 | | 32 | | | | | | | | | | | | | | | | | | | | | | | |
| 11-12 A.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12- 1 P.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1- 2 P.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2- 3 P.M. | 4 | 4 | | | | 32 | | | | | | | | | | | | | | | | | | | | | |
| 3- 4 P.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4- 5 P.M. | 4 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5- 6 P.M. | 4 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6- 7 P.M. | 5 | 5 | | 34 | | | | | | | | | | | | | | | | | | | | | | | |
| 7- 8 P.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8- 9 P.M. | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9-10 P.M. | 5 | 4 | | | | 34 | | | | | | | | | | | | | | | | | | | | | |
| 10-11 P.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11-12 P.M. | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL | 100 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | |

REMARKS:

P 100 C 100

# PUSHING AND CHARGING REPORT

## "B" BATTERY

DATE 3-11-90

| SH | | CHARGE | | CLEAN CHUCK DOOR | COMMENTS | PUSH | | CHARGE | | CLEAN CHUCK DOOR | COMMENTS | TIME A.M. | P | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 239 | A34 | 251 | A6 | | B1 | 253 | B34 | 234 | B6 | | 12-1 | 5 | 5 |
| 6 | 307 | A1 | 302 | A11 | | B6 | 321 | B1 | 316 | B11 | | 1-2 | 5 | 5 |
| 11 | 335 | A6 | 310 | A16 | | B11 | 350 | B6 | 345 | B16 | | 2-3 | 4 | 4 |
| 16 | 407 | A11 | 400 | A21 | | B16 | 418 | B11 | 415 | B21 | | 3-4 | 4 | 4 |
| 21 | 426 | A16 | 428 | A26 | | B21 | 448 | B16 | 441 | B26 | | 4-5 | 4 | 4 |
| 26 | 500 | A21 | 500 | A31 | | B26 | 514 | B21 | 510 | B31 | | 5-6 | 5 | 5 |
| 31 | 528 | A26 | 523 | A36 | | B31 | 542 | B26 | 538 | B36 | | 6-7 | 4 | 4 |
| 36 | 557 | A31 | 552 | B3 | | B36 | 611 | B31 | 605 | | | 7-8 | 3 | 3 |
| 3 | 624 | A36 | 620 | A8 | | B3 | 639 | B36 | 634 | B8 | | 8-9 | 2 | 4 |
| 8 | 653 | A3 | 648 | A13 | | B8 | 707 | B3 | 702 | B13 | | 9-10 | 5 | 3 |
| 13 | 721 | A8 | 716 | A18 | | B13 | 735 | B8 | 730 | B18 | | 10-11 | 4 | 4 |
| 18 | 810 | A13 | 815 | A23 | | B18 | 825 | B13 | 825 | B23 | | 11-12 | 4 | 4 |
| 23 | 915 | A18 | 837 | A28 | | B23 | 925 | B18 | 850 | B28 | | | | |
| 28 | 935 | A23 | 935 | A33 | | B28 | 947 | B23 | 947 | B33 | | TIME P.M. | P | C |
| 33 | 959 | A28 | 959 | A38 | | B33 | 10[illegible] | B28 | 105 | | | 12-1 | | |
| 38 | 1028 | A33 | 1030 | B5 | | | | | | | | 1-2 | | |
| 5 | 1042 | B33 | 1044 | A10 | | B5 | 1053 | A38 | 1057 | B10 | | 2-3 | | |
| 10 | 1103 | A5 | 1105 | A15 | | B10 | 1115 | B5 | 1117 | B15 | | 3-4 | | |
| 15 | 1130 | A10 | 1132 | A20 | | B15 | 1145 | B10 | 1147 | B20 | | 4-5 | | |
| 20 | | A15 | | A25 | | B20 | | B15 | | B25 | | 5-6 | | |
| 25 | | A20 | | A30 | | B25 | | B20 | | B30 | | 6-7 | | |
| 30 | | A25 | | A35 | | B30 | | B25 | | B35 | | 7-8 | | |
| 35 | | A30 | | B2 | | B35 | | B30 | | | | 8-9 | | |
| 2 | | A35 | | A7 | | B2 | | B35 | | B7 | | 9-10 | | |
| 7 | | A2 | | A12 | | B7 | | B2 | | B12 | | 10-11 | | |
| 12 | | A7 | | A17 | | B12 | | B7 | | B17 | | 11-12 | | |
| 17 | | A12 | | A22 | | B17 | | B12 | | B22 | | TOTALS | | |
| 22 | | A17 | | A27 | | B22 | | B17 | | B27 | | | P | C |
| 27 | | A22 | | A32 | | B27 | | B22 | | B32 | | 12x8 | 34 | 34 |
| 32 | | A27 | | A37 | | B32 | | B27 | | B37 | | 8x4 | 15 | 15 |
| 37 | | A32 | | B4 | | B37 | | B32 | | | | 4x12 | | |
| 4 | | A37 | | A9 | | B4 | 12[illegible] | B37 | 12[illegible] | B9 | | Total | 49 | 49 |
| 9 | 1200 | A4 | 1202 | A14 | | B9 | 1212 | B4 | 1214 | B14 | | | | |
| 14 | 1224 | A9 | 1226 | A19 | | B14 | 1236 | B9 | 1239 | B19 | | | | |
| 19 | 1249 | A14 | 1250 | A24 | | B19 | 100 | B14 | 103 | B24 | | FOREMAN | | |
| 24 | 114 | A19 | 116 | A29 | | B24 | 128 | B19 | 128 | B29 | | 12x8 | Sawders | |
| 29 | 142 | A24 | 140 | A34 | | B29 | 157 | B24 | 154 | B34 | | 8x4 | Smith | |
| 34 | 2[illegible] | A29 | 206 | B1 | | B34 | 225 | B29 | 220 | | | 4x12 | Shelton | |

LEAN A-1, A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH

.000/0068
15

CAR

PUSHER

# PUSHING AND CHARGING REPORT

## "B" BATTERY

P.M

DATE 3-11-90

| PUSH | 26 | CHARGE | | CLEAN CHUCK DOOR | COMMENTS | PUSH | 25 | CHARGE | | CLEAN CHUCK DOOR | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 9:02 | A34 | 8:55 | A6 | BY PASS | B1 | 9:15 | B34 | 9:04 | B6 | |
| 6 | 9:28 | A1 | 9:25 | A11 | BY-PASS | B6 | 9:37 | B1 | 9:37 | B11 | BY-PASS |
| 11 | 9:59 | A6 | 9:55 | A16 | | B11 | 10:09 | B6 | 10:05 | B16 | |
| 16 | 10:11 | A11 | 10:13 | A21 | BY-PASS | B16 | 10:25 | B11 | 10:25 | B21 | |
| 21 | 10:39 | A16 | 10:39 | A26 | BY-PASS | B21 | 10:53 | B16 | 10:53 | B26 | |
| 26 | 11:07 | A21 | 11:07 | A31 | | B26 | 11:21 | B21 | 11:21 | B31 | |
| 31 | 11:35 | A26 | 11:35 | A36 | | B31 | | B26 | | B36 | |
| 36 | | A31 | | B3 | | B36 | | B31 | | | |
| 3 | | A36 | | A8 | | B3 | | B36 | | B8 | |
| 8 | | A3 | | A13 | | B8 | | B3 | | B13 | |
| 13 | | A8 | | A18 | | B13 | | B8 | | B18 | |
| 18 | | A13 | | A23 | | B18 | | B13 | | B23 | |
| 23 | | A18 | | A28 | | B23 | | B18 | | B28 | |
| 28 | | A23 | | A33 | | B28 | | B23 | | B33 | |
| 33 | | A28 | | A38 | | B33 | | B28 | | | |
| 38 | | A33 | | B5 | | | | | | | |
| 5 | | B33 | | A10 | | B5 | | A38 | | B10 | |
| 10 | | A5 | | A15 | | B10 | | B5 | | B15 | |
| 15 | | A10 | | A20 | | B15 | | B10 | | B20 | |
| 20 | 12:06 | A15 | 12:04 | A25 | | B20 | 12:15 | B15 | 12:14 | B25 | |
| 25 | 12:26 | A20 | 12:22 | A30 | | B25 | 12:37 | B20 | 12:31 | B30 | |
| 30 | 12:40 | A25 | 12:41 | A35 | | B30 | 1:00 | B25 | 1:03 | B35 | |
| 35 | 1:13 | A30 | 1:14 | B2 | | B35 | 1:30 | B30 | 1:22 | | |
| 2 | 1:43 | A35 | 1:38 | A7 | | B2 | 1:57 | B35 | 1:51 | B7 | |
| 7 | 2:06 | A2 | 2:10 | A12 | | B7 | 2:20 | B2 | 2:21 | B12 | |
| 12 | 2:35 | A7 | 2:32 | A17 | | B12 | 2:50 | B7 | 2:48 | B17 | |
| 17 | 3:05 | A12 | 3:02 | A22 | | B17 | 3:20 | B12 | 3:14 | B22 | |
| 22 | 3:36 | A17 | 3:29 | A27 | | B22 | 4:08 | B17 | 4:11 | B27 | |
| 27 | 4:20 | A22 | 4:28 | A32 | | B27 | 4:29 | B22 | 4:45 | B32 | |
| 32 | 4:38 | A27 | 5:09 | A37 | | B32 | 5:45 | B27 | 5:23 | B37 | |
| 37 | 5:15 | A32 | 5:43 | B4 | | B37 | 5:32 | B32 | 5:28 | | |
| 4 | 5:52 | A37 | 5:55 | A6 | | B4 | 6:07 | B37 | 6:29 | B6 | |
| 8 | 6:24 | A4 | 6:15 | A14 | | B9 | 6:34 | B4 | 6:32 | B14 | |
| 14 | 6:46 | A9 | 6:40 | A19 | | B14 | 6:52 | B9 | 6:55 | B19 | |
| 19 | 7:08 | A14 | 7:10 | A24 | | B19 | 7:18 | B14 | 7:20 | B24 | |
| 24 | 7:29 | A19 | 7:30 | A29 | | B24 | 7:30 | B19 | 7:41 | B29 | |
| 29 | 7:55 | A24 | 7:53 | A34 | | B29 | 8:10 | B24 | 8:00 | B34 | |
| 34 | 8:55 | A29 | 8:16 | B1 | | B34 | 8:45 | B29 | 8:40 | | |

| TIME A.M. | P | C |
|---|---|---|
| 12-1 | | |
| 1-2 | | |
| 2-3 | | |
| 3-4 | | |
| 4-5 | | |
| 5-6 | | |
| 6-7 | | |
| 7-8 | | |
| 8-9 | | |
| 9-10 | | |
| 10-11 | | |
| 11-12 | | |

| TIME P.M. | P | C |
|---|---|---|
| 12-1 | 5 | 5 |
| 1-2 | 5 | 5 |
| 2-3 | 4 | 4 |
| 3-4 | 3 | 3 |
| 4-5 | 4 | 3 |
| 5-6 | 4 | 5 |
| 6-7 | 5 | 5 |
| 7-8 | 5 | 5 |
| 8-9 | 3 | 4 |
| 9-10 | 5 | 4 |
| 10-11 | 5 | 5 |
| 11-12 | 3 | 3 |

TOTALS

| | P | C |
|---|---|---|
| 12x8 | | |
| 8x4 | 17 | 17 |
| 4x12 | 34 | 34 |
| Total | 51 | 51 |

FOREMAN

12x8 - Sanders

8x4 - Smith

4x12 - Shelton

CLEAN A-1, A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH

PAGE.008

MAR 14 '90 13:29

# PUSHING SCHEDULE FOR BATTERY B

| SEQ # | PUSH | CHARGE | EARLIEST TIME | DESIRED TIME | LATEST TIME | PM |
|---|---|---|---|---|---|---|
| 1 | B31 | B26 | 11:50 | 12: 0 | 12:25 | 1 |
| 2 | A36 | A31 | 12: 4 | 12:14 | 12:39 | 1 |
| 3 | B36 | B31 | 12:18 | 12:28 | 12:53 | 1 |
| 4 | A 3 | A36 | 12:32 | 12:42 | 1: 7 | 1 |
| 5 | B 3 | B36 | 12:46 | 12:56 | 1:21 | 1 |
| 6 | A 8 | A 3 | 1: 0 | 1:10 | 1:35 | 1 |
| 7 | B 8 | B 3 | 1:14 | 1:24 | 1:49 | 1 |
| 8 | A13 | A 8 | 1:28 | 1:38 | 2: 3 | 1 |
| 9 | B13 | B 8 | 1:42 | 1:52 | 2:17 | 1 |
| 10 | A18 | A13 | 1:57 | 2: 7 | 2:32 | 1 |
| 11 | B18 | B13 | 2:11 | 2:21 | 2:46 | 1 |
| 12 | A23 | A18 | 2:25 | 2:35 | 3: 0 | 1 |
| 13 | B23 | B18 | 2:39 | 2:49 | 3:14 | 1 |
| 14 | A28 | A23 | 2:53 | 3: 3 | 3:28 | 1 |
| 15 | B28 | B23 | 3: 7 | 3:17 | 3:42 | 1 |
| 16 | A33 | A28 | 3:21 | 3:31 | 3:56 | 1 |
| 17 | B33 | B28 | 3:35 | 3:45 | 4:10 | 1 |
| 18 | A38 | A33 | 3:50 | 4: 0 | 4:25 | 1 |
| 19 | A 5 | B33 | 4: 4 | 4:14 | 4:39 | 1 |
| 20 | B 5 | A38 | 4:18 | 4:28 | 4:53 | 1 |
| 21 | A10 | A 5 | 4:32 | 4:42 | 5: 7 | 1 |
| 22 | B10 | B 5 | 4:46 | 4:56 | 5:21 | 1 |
| 23 | A15 | A10 | 5: 0 | 5:10 | 5:35 | 1 |
| 24 | B15 | B10 | 5:14 | 5:24 | 5:49 | 1 |
| 25 | A20 | A15 | 5:28 | 5:38 | 6: 3 | 1 |
| 26 | B20 | B15 | 5:42 | 5:52 | 6:17 | 1 |
| 27 | A25 | A20 | 5:57 | 6: 7 | 6:32 | 1 |
| 28 | B25 | B20 | 6:11 | 6:21 | 6:46 | 1 |
| 29 | A30 | A25 | 6:25 | 6:35 | 7: 0 | 1 |
| 30 | B30 | B25 | 6:39 | 6:49 | 7:14 | 1 |
| 31 | A35 | A30 | 6:53 | 7: 3 | 7:28 | 1 |
| 32 | B35 | B30 | 7: 7 | 7:17 | 7:42 | 1 |
| 33 | A 2 | A35 | 7:21 | 7:31 | 7:56 | 1 |
| 34 | B 2 | B35 | 7:35 | 7:45 | 8:10 | 1 |

MON MAR 12 1990 12X 8 TURN

# PUSHING SCHEDULE FOR BATTERY B

| SEQ # | PUSH | CHARGE | EARLIEST TIME | DESIRED TIME | LATEST TIME | PM |
|---|---|---|---|---|---|---|
| 1 | A 7 | A 2 | 7:50 | 8: 0 | 8:25 | 1 |
| 2 | B 7 | B 2 | 8: 5 | 8:15 | 8:40 | 1 |
| 3 | A12 | A 7 | 8:20 | 8:30 | 8:55 | 1 |
| 4 | B12 | B 7 | 8:35 | 8:45 | 9:10 | 1 |
| 5 | A17 | A12 | 8:50 | 9: 0 | 9:25 | 1 |
| 6 | B17 | B12 | 9: 5 | 9:15 | 9:40 | 1 |
| 7 | A22 | A17 | 9:20 | 9:30 | 9:55 | 1 |
| 8 | B22 | B17 | 9:35 | 9:45 | 10:10 | 1 |
| 9 | A27 | A22 | 9:50 | 10: 0 | 10:25 | 1 |
| 10 | B27 | B22 | 10: 5 | 10:15 | 10:40 | 1 |
| 11 | A32 | A27 | 10:20 | 10:30 | 10:55 | 1 |
| 12 | B32 | B27 | 10:35 | 10:45 | 11:10 | 1 |
| 13 | A37 | A32 | 10:50 | 11: 0 | 11:25 | 1 |
| 14 | B37 | B32 | 11: 5 | 11:15 | 11:40 | 1 |
| 15 | A 4 | A37 | 11:20 | 11:30 | 11:55 | 1 |
| 16 | B 4 | B37 | 11:35 | 11:45 | 12:10 | 1 |
| 17 | A 9 | A 4 | 11:50 | 12: 0 | 12:25 | 1 |
| 18 | B 9 | B 4 | 12: 5 | 12:15 | 12:40 | 1 |
| 19 | A14 | A 9 | 12:20 | 12:30 | 12:55 | 1 |
| 20 | B14 | B 9 | 12:35 | 12:45 | 1:10 | 1 |
| 21 | A19 | A14 | 12:50 | 1: 0 | 1:25 | 1 |
| 22 | B19 | B14 | 1: 5 | 1:15 | 1:40 | 1 |
| 23 | A24 | A19 | 1:20 | 1:30 | 1:55 | 1 |
| 24 | B24 | B19 | 1:35 | 1:45 | 2:10 | 1 |
| 25 | A29 | A24 | 1:50 | 2: 0 | 2:25 | 1 |
| 26 | B29 | B24 | 2: 5 | 2:15 | 2:40 | 1 |
| 27 | A34 | A29 | 2:20 | 2:30 | 2:55 | 1 |
| 28 | B34 | B29 | 2:35 | 2:45 | 3:10 | 1 |
| 29 | A 1 | A34 | 2:50 | 3: 0 | 3:25 | 1 |
| 30 | B 1 | B34 | 3: 5 | 3:15 | 3:40 | 1 |
| 31 | A 6 | A 1 | 3:20 | 3:30 | 3:55 | 1 |
| 32 | B 6 | B 1 | 3:35 | 3:45 | 4:10 | 1 |

MON MAR 12 1990 8X 4 TURN

# PUSHING SCHEDULE FOR BATTERY B

| SEQ # | PUSH | CHARGE | EARLIEST TIME | DESIRED TIME | LATEST TIME | PM |
|---|---|---|---|---|---|---|
| 1 | A11 | A 6 | 3:50 | 4: 0 | 4:25 | 1 |
| 2 | B11 | B 6 | 4: 4 | 4:14 | 4:39 | 1 |
| 3 | A16 | A11 | 4:18 | 4:28 | 4:53 | 1 |
| 4 | B16 | B11 | 4:32 | 4:42 | 5: 7 | 1 |
| 5 | A21 | A16 | 4:46 | 4:56 | 5:21 | 1 |
| 6 | B21 | B16 | 5: 0 | 5:10 | 5:35 | 1 |
| 7 | A26 | A21 | 5:14 | 5:24 | 5:49 | 1 |
| 8 | B26 | B21 | 5:28 | 5:38 | 6: 3 | 1 |
| 9 | A31 | A26 | 5:42 | 5:52 | 6:17 | 1 |
| 10 | B31 | B26 | 5:57 | 6: 7 | 6:32 | 1 |
| 11 | A36 | A31 | 6:11 | 6:21 | 6:46 | 1 |
| 12 | B36 | B31 | 6:25 | 6:35 | 7: 0 | 1 |
| 13 | A 3 | A36 | 6:39 | 6:49 | 7:14 | 1 |
| 14 | B 3 | B36 | 6:53 | 7: 3 | 7:28 | 1 |
| 15 | A 8 | A 3 | 7: 7 | 7:17 | 7:42 | 1 |
| 16 | B 8 | B 3 | 7:21 | 7:31 | 7:56 | 1 |
| 17 | A13 | A 8 | 7:35 | 7:45 | 8:10 | 1 |
| 18 | B13 | B 8 | 7:50 | 8: 0 | 8:25 | 1 |
| 19 | A18 | A13 | 8: 4 | 8:14 | 8:39 | 1 |
| 20 | B18 | B13 | 8:18 | 8:28 | 8:53 | 1 |
| 21 | A23 | A18 | 8:32 | 8:42 | 9: 7 | 1 |
| 22 | B23 | B18 | 8:46 | 8:56 | 9:21 | 1 |
| 23 | A28 | A23 | 9: 0 | 9:10 | 9:35 | 1 |
| 24 | B28 | B23 | 9:14 | 9:24 | 9:49 | 1 |
| 25 | A33 | A28 | 9:28 | 9:38 | 10: 3 | 1 |
| 26 | B33 | B28 | 9:42 | 9:52 | 10:17 | 1 |
| 27 | A38 | A33 | 9:57 | 10: 7 | 10:32 | 1 |
| 28 | A 5 | B33 | 10:11 | 10:21 | 10:46 | 1 |
| 29 | B 5 | A38 | 10:25 | 10:35 | 11: 0 | 1 |
| 30 | A10 | A 5 | 10:39 | 10:49 | 11:14 | 1 |
| 31 | B10 | B 5 | 10:53 | 11: 3 | 11:28 | 1 |
| 32 | A15 | A10 | 11: 7 | 11:17 | 11:42 | 1 |
| 33 | B15 | B10 | 11:21 | 11:31 | 11:56 | 1 |
| 34 | A20 | A15 | 11:35 | 11:45 | 12:10 | 1 |

MON MAR 12 1990 4X12 TURN

MAR 14 '90 13:19 PAGE.004

CC-1044 REV. 055

**UNITED STATES STEEL CORPORATION**
**CLAIRTON WORKS**

FOREMAN ON DUTY

HOURLY OPERATION OF BATTERIES

DATE 3-12-90

| FOREMAN | | 12 M. - 8 A.M. | 8 A.M. - 4 P.M. | 4 P.M. - 12 M. |
|---|---|---|---|---|
| | Batteries 1-2-3 B | Sanders | Smith | Shelton |
| | Batteries 4-5-6 | | | |
| | Relief 1 to 6 | | | |
| | Batteries 7-8-9 | | | |
| | Batteries 10-11-12 | | | |
| | Relief 7 to 12 | | | |
| | Batteries 13-14-15 | | | |
| | Batteries 16-17-18 | | | |
| | Relief 13 to 18 | | | |
| | Batteries 19-20 | | | |
| | Batteries 21-22 | | | |
| | Relief 19 to 22 | | | |

| | Batt. 1-2-3 | | | Batt. 4-5-6 | | | Batt. 7-8-9 | | | Batt. 10-11-12 | | | Batt. 13-14-15 | | | Batt. 16-17-18 | | | Batt. 19-20 | | | Batt. 21-22 | | | Batt. 12-A | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S | P | C | S |
| 12- 1 A.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1- 2 A.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2- 3 A.M. | 4 | 4 | | 34 | | | | | | | | | | | | | | | | | | | | | | | |
| 3- 4 A.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4- 5 A.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5- 6 A.M. | 5 | 5 | | | 34 | | | | | | | | | | | | | | | | | | | | | | |
| 6- 7 A.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7- 8 A.M. | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8- 9 A.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9-10 A.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10-11 A.M. | 4 | 4 | | 32 | | | | | | | | | | | | | | | | | | | | | | | |
| 11-12 A.M. | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12- 1 P.M. | 4 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1- 2 P.M. | 4 | 4 | | | 32 | | | | | | | | | | | | | | | | | | | | | | |
| 2- 3 P.M. | 5 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3- 4 P.M. | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4- 5 P.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5- 6 P.M. | 5 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6- 7 P.M. | 4 | 5 | | 34 | | | | | | | | | | | | | | | | | | | | | | | |
| 7- 8 P.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8- 9 P.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9-10 P.M. | 3 | 3 | | | 34 | | | | | | | | | | | | | | | | | | | | | | |
| 10-11 P.M. | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11-12 P.M. | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL | 100 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | |

REMARKS:

P 100 C 100

.000.0088
85

# PUSHING AND CHARGING REPORT

## "B" BATTERY

DATE 3-12-90

AM

| PUSH | | CHARGE | | CLEAN CHUCK DOOR | COMMENTS | PUSH | | CHARGE | | CLEAN CHUCK DOOR | COMMENTS | TIME A.M. | P | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | A34 | | A6 | | B1 | | B34 | | B6 | | 12-1 | 5 | 5 |
| 6 | | A1 | | A11 | | B6 | | B1 | | B11 | | 1-2 | 5 | 5 |
| 11 | | A6 | | A16 | | B11 | | B6 | | B16 | | 2-3 | 4 | 4 |
| 16 | | A11 | | A21 | | B16 | | B11 | | B21 | | 3-4 | 4 | 4 |
| 21 | | A16 | | A26 | | B21 | | B16 | | B26 | | 4-5 | 4 | 4 |
| 26 | | A21 | | A31 | | B26 | | B21 | | B31 | | 5-6 | 5 | 5 |
| A31 | | A26 | | A36 | | B31 | 12:08 | B26 | 12:06 | B36 | | 6-7 | 4 | 4 |
| A36 | 12:20 | A31 | 12:20 | B3 | | B36 | 12:32 | B31 | 12:34 | | | 7-8 | 3 | 3 |
| B3 | 12:42 | A36 | 12:52 | B8 | | B3 | 12:52 | B36 | 12:52 | B8 | | 8-9 | 5 | 5 |
| B8 | 1:10 | A3 | 1:16 | A13 | | B8 | 1:21 | B3 | 1:32 | B13 | | 9-10 | 4 | 4 |
| A13 | 1:24 | A8 | 1:40 | A18 | | B13 | 1:46 | B8 | 1:51 | B18 | | 10-11 | 4 | 4 |
| A18 | 1:57 | A13 | 1:59 | A23 | | B18 | 2:11 | B13 | 2:12 | B23 | | 11-12 | 3 | 4 |
| A23 | 2:25 | A18 | 2:26 | A28 | | B23 | 2:29 | B18 | 2:42 | B28 | | | | |
| A28 | 2:52 | A23 | 2:56 | A33 | X | B28 | 3:02 | B23 | 3:10 | B33 | | TIME P.M. | P | C |
| A33 | 3:21 | A28 | 3:32 | A38 | X | B33 | 3:32 | B28 | 3:32 | | | 12-1 | | |
| A38 | 3:50 | A33 | 3:51 | B5 | | | | | | | | 1-2 | | |
| B5 | 4:09 | B33 | 4:00 | A10 | X | B5 | 4:18 | A38 | 4:11 | B10 | | 2-3 | | |
| A10 | 4:22 | A5 | 4:26 | A15 | | B10 | 4:46 | B5 | 4:38 | B15 | | 3-4 | | |
| A15 | 5:02 | A10 | 5:00 | A20 | | B15 | 5:16 | B10 | 5:14 | B20 | | 4-5 | | |
| A20 | 5:32 | A15 | 5:26 | A25 | | B20 | 5:52 | B15 | 5:46 | B25 | | 5-6 | | |
| A25 | 5:59 | A20 | 5:59 | A30 | | B25 | 6:25 | B20 | 6:13 | B30 | | 6-7 | | |
| A30 | 6:25 | A25 | 6:29 | A35 | | B30 | 6:42 | B25 | 6:39 | B35 | | 7-8 | | |
| A35 | 6:53 | A30 | 6:55 | B2 | | B35 | 7:07 | B30 | 7:05 | | | 8-9 | | |
| B2 | 7:21 | A35 | 7:17 | A7 | | B2 | 7:25 | B35 | 7:30 | B7 | | 9-10 | | |
| A7 | 8:07 | A2 | 8:10 | A12 | | B7 | 8:19 | B2 | 8:23 | B12 | | 10-11 | | |
| A12 | 8:34 | A7 | 8:39 | A17 | | B12 | 8:48 | B7 | 8:47 | B17 | | 11-12 | | |
| A17 | 8:58 | A12 | 8:59 | A22 | | B17 | 9:13 | B12 | 9:12 | B22 | | TOTALS | | |
| A22 | 9:26 | A17 | 9:25 | A27 | | B22 | 9:42 | B17 | 9:41 | B27 | | | P | C |
| A27 | 9:50 | A22 | 9:53 | A32 | | B27 | 10:05 | B22 | 10:07 | B32 | | 12x8 | 34 | 34 |
| A32 | 10:20 | A27 | 10:21 | A37 | | B32 | 10:35 | B27 | 10:33 | B37 | | 8x4 | 16 | 17 |
| A37 | 10:50 | A32 | 10:46 | B4 | | B37 | 11:05 | B32 | 11:09 | | | 4x12 | | |
| B4 | 11:20 | A37 | 11:15 | A9 | | B4 | 11:26 | B37 | 11:34 | B9 | | Total | 50 | 51 |
| B9 | | A4 | 11:55 | A14 | | B9 | | B4 | | B14 | | | | |
| A14 | | A9 | | A19 | | B14 | | B9 | | B19 | | | | |
| A19 | | A14 | | A24 | | B19 | | B14 | | B24 | | FOREMAN | | |
| A24 | | A19 | | A29 | | B24 | | B19 | | B29 | | 12x8 - | | |
| A29 | | A24 | | A34 | | B29 | | B24 | | B34 | | 8x4 - | | |
| A34 | | A29 | | B1 | | B34 | | B29 | | | | 4x12- | | |

CLEAN A-1, A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH.

PAGE.006

MAR 14 '90 13:23

FINISH UP 90 FISHING

# PUSHING AND CHARGING REPORT

## "B" BATTERY

P.M

DATE 2-12-90

| PUSH | 25 | CHARGE | 25 | CLEAN CHUCK DOOR | COMMENTS | PUSH | 25 | CHARGE | 25 | CLEAN CHUCK DOOR | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 3:55 | A34 | 3:00 | A6 | | B1 | 3:06 | B34 | 3:15 | B8 | |
| A6 | 3:23 | A1 | 3:25 | A11 | | B6 | 3:36 | B1 | 3:31 | B11 | |
| A11 | 4:10 | A6 | 4:13 | A16 | | B11 | 4:22 | B6 | 4:22 | B16 | |
| A16 | 4:53 | A11 | 4:57 | A21 | | B16 | 4:43 | B11 | 4:41 | B21 | |
| A21 | 4:52 | A16 | 4:57 | A26 | | B21 | 5:55 | B16 | 5:29 | B26 | |
| A26 | 5:23 | A21 | 5:21 | A31 | | B26 | 5:33 | B21 | 5:33 | B31 | |
| A31 | 5:55 | A26 | 5:57 | A36 | | B31 | 5:57 | B26 | 6:02 | B36 | |
| A36 | 6:11 | A31 | 6:15 | B3 | | B36 | 6:25 | B31 | 6:29 | | |
| B3 | 6:39 | A36 | 6:43 | A8 | | B3 | 6:53 | B36 | 6:50 | B6 | |
| B8 | 7:07 | A3 | 7:03 | A13 | | B8 | 7:21 | B3 | 7:23 | B13 | |
| B13 | 7:35 | A8 | 7:31 | A18 | | B13 | 7:50 | B8 | 7:52 | B18 | |
| B18 | 8:04 | A13 | 8:02 | A23 | | B18 | 8:[illegible] | B13 | 8:16 | B23 | |
| B23 | 8:32 | A18 | 8:30 | A28 | | B23 | 8:44 | B18 | 8:44 | B28 | |
| B28 | 9:00 | A23 | 9:00 | A33 | | B28 | 9:23 | B23 | 9:21 | B33 | |
| B33 | 9:52 | A28 | 9:30 | A38 | | B33 | 10:03 | B28 | 10:00 | | |
| B38 | 10:00 | A33 | 10:30 | B5 | | | | | | | |
| | 10:30 | B33 | 10:30 | A10 | | B5 | 10:50 | A38 | 10:58 | B10 | |
| | 10:55 | A5 | 10:58 | A15 | | B10 | 11:02 | B5 | 11:07 | B15 | |
| | 11:21 | A10 | 11:21 | A20 | | B15 | 11:30 | B10 | 11:35 | B20 | |
| | 11:45 | A15 | 11:47 | A25 | | B20 | | B15 | | B25 | |
| | | A20 | | A30 | | B25 | | B20 | | B30 | |
| | | A25 | | A35 | | B30 | | B25 | | B35 | |
| | | A30 | | B2 | | B35 | | B30 | | | |
| | | A35 | | A7 | | B2 | | B35 | | B7 | |
| | | A2 | | A12 | | B7 | | B2 | | B12 | |
| | | A7 | | A17 | | B12 | | B7 | | B17 | |
| | | A12 | | A22 | | B17 | | B12 | | B22 | |
| | | A17 | | A27 | | B22 | | B17 | | B27 | |
| | | A22 | | A32 | | B27 | | B22 | | B32 | |
| | | A27 | | A37 | | B32 | | B27 | | B37 | |
| | | A32 | | B4 | | B37 | | B32 | | | |
| | | A37 | | A9 | | B4 | | B37 | | B9 | |
| :00 | | A4 | | A14 | | B9 | 12:[illegible] | B4 | 12:30 | B14 | |
| :30 | | A9 | 12:30 | A19 | | B14 | 12:37 | B9 | 12:43 | B19 | |
| :5 | | A14 | 1:07 | A24 | | B19 | 1:17 | B14 | 1:14 | B24 | |
| :39 | | A19 | 1:22 | A29 | | B24 | 1:48 | B19 | 1:46 | B29 | |
| :9 | | A24 | 2:00 | A34 | | B29 | 2:20 | B24 | 2:18 | B34 | |
| :30 | | A29 | 2:32 | B1 | | B34 | 2:45 | B29 | 2:44 | | |

| TIME A.M. | P | C |
|---|---|---|
| 12-1 | | |
| 1-2 | | |
| 2-3 | | |
| 3-4 | | |
| 4-5 | | |
| 5-6 | | |
| 6-7 | | |
| 7-8 | | |
| 8-9 | | |
| 9-10 | | |
| 10-11 | | |
| 11-12 | | |

| TIME P.M. | P | C |
|---|---|---|
| 12-1 | 4 | 3 |
| 1-2 | 4 | 4 |
| 2-3 | 5 | 4 |
| 3-4 | 3 | 4 |
| 4-5 | 5 | 5 |
| 5-6 | 5 | 4 |
| 6-7 | 4 | 5 |
| 7-8 | 4 | 4 |
| 8-9 | 4 | 4 |
| 9-10 | 3 | 3 |
| 10-11 | 5 | 5 |
| 11-12 | 4 | 4 |

| TOTALS | P | C |
|---|---|---|
| 12x8 | | |
| 8x4 | 16 | 15 |
| 4x12 | 34 | 34 |
| Total | 50 | 49 |

FOREMAN

12x8 -

8x4 -

4x12-

A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH

# PUSHING SCHEDULE FOR BATTERY B

| SEQ # | PUSH | CHARGE | EARLIEST TIME | DESIRED TIME | LATEST TIME | PN |
|---|---|---|---|---|---|---|
| 1 | B20 | B15 | 11:50 | 12: 0 | 12:25 | 1 |
| 2 | A25 | A20 | 12: 4 | 12:14 | 12:39 | 1 |
| 3 | B25 | B20 | 12:18 | 12:28 | 12:53 | 1 |
| 4 | A30 | A25 | 12:32 | 12:42 | 1: 7 | 1 |
| 5 | B30 | B25 | 12:46 | 12:56 | 1:21 | 1 |
| 6 | A35 | A30 | 1: 0 | 1:10 | 1:35 | 1 |
| 7 | B35 | B30 | 1:14 | 1:24 | 1:49 | 1 |
| 8 | A 2 | A35 | 1:28 | 1:38 | 2: 3 | 1 |
| 9 | B 2 | B35 | 1:42 | 1:52 | 2:17 | 1 |
| 10 | A 7 | A 2 | 1:57 | 2: 7 | 2:32 | 1 |
| 11 | B 7 | B 2 | 2:11 | 2:21 | 2:46 | 1 |
| 12 | A12 | A 7 | 2:25 | 2:35 | 3: 0 | 1 |
| 13 | B12 | B 7 | 2:39 | 2:49 | 3:14 | 1 |
| 14 | A17 | A12 | 2:53 | 3: 3 | 3:28 | 1 |
| 15 | B17 | B12 | 3: 7 | 3:17 | 3:42 | 1 |
| 16 | A22 | A17 | 3:21 | 3:31 | 3:56 | 1 |
| 17 | B22 | B17 | 3:35 | 3:45 | 4:10 | 1 |
| 18 | A27 | A22 | 3:50 | 4: 0 | 4:25 | 1 |
| 19 | B27 | B22 | 4: 4 | 4:14 | 4:39 | 1 |
| 20 | A32 | A27 | 4:18 | 4:28 | 4:53 | 1 |
| 21 | B32 | B27 | 4:32 | 4:42 | 5: 7 | 1 |
| 22 | A37 | A32 | 4:46 | 4:56 | 5:21 | 1 |
| 23 | B37 | B32 | 5: 0 | 5:10 | 5:35 | 1 |
| 24 | A 4 | A37 | 5:14 | 5:24 | 5:49 | 1 |
| 25 | B 4 | B37 | 5:28 | 5:38 | 6: 3 | 1 |
| 26 | A 9 | A 4 | 5:42 | 5:52 | 6:17 | 1 |
| 27 | B 9 | B 4 | 5:57 | 6: 7 | 6:32 | 1 |
| 28 | A14 | A 9 | 6:11 | 6:21 | 6:46 | 1 |
| 29 | B14 | B 9 | 6:25 | 6:35 | 7: 0 | 1 |
| 30 | A19 | A14 | 6:39 | 6:49 | 7:14 | 1 |
| 31 | B19 | B14 | 6:53 | 7: 3 | 7:28 | 1 |
| 32 | A24 | A19 | 7: 7 | 7:17 | 7:42 | 1 |
| 33 | B24 | B19 | 7:21 | 7:31 | 7:56 | 1 |
| 34 | A29 | A24 | 7:35 | 7:45 | 8:10 | 1 |

TUE MAR 13 1990 12X 8 TURN

# PUSHING SCHEDULE FOR BATTERY B

| SEQ # | PUSH | CHARGE | EARLIEST TIME | DESIRED TIME | LATEST TIME |
|---|---|---|---|---|---|
| 1 | B29 | B24 | 7:50 | 8: 0 | 8:25 |
| 2 | A34 | A29 | 8: 5 | 8:15 | 8:40 |
| 3 | B34 | B29 | 8:20 | 8:30 | 8:55 |
| 4 | A 1 | A34 | 8:35 | 8:45 | 9:10 |
| 5 | B 1 | B34 | 8:50 | 9: 0 | 9:25 |
| 6 | A 6 | A 1 | 9: 5 | 9:15 | 9:40 |
| 7 | B 6 | B 1 | 9:20 | 9:30 | 9:55 |
| 8 | A11 | A 6 | 9:35 | 9:45 | 10:10 |
| 9 | B11 | B 6 | 9:50 | 10: 0 | 10:25 |
| 10 | A16 | A11 | 10: 5 | 10:15 | 10:40 |
| 11 | B16 | B11 | 10:20 | 10:30 | 10:55 |
| 12 | A21 | A16 | 10:35 | 10:45 | 11:10 |
| 13 | B21 | B16 | 10:50 | 11: 0 | 11:25 |
| 14 | A26 | A21 | 11: 5 | 11:15 | 11:40 |
| 15 | B26 | B21 | 11:20 | 11:30 | 11:55 |
| 16 | A31 | A26 | 11:35 | 11:45 | 12:10 |
| 17 | B31 | B26 | 11:50 | 12: 0 | 12:25 |
| 18 | A36 | A31 | 12: 5 | 12:15 | 12:40 |
| 19 | B36 | B31 | 12:20 | 12:30 | 12:55 |
| 20 | A 3 | A36 | 12:35 | 12:45 | 1:10 |
| 21 | B 3 | B36 | 12:50 | 1: 0 | 1:25 |
| 22 | A 8 | A 3 | 1: 5 | 1:15 | 1:40 |
| 23 | B 8 | B 3 | 1:20 | 1:30 | 1:55 |
| 24 | A13 | A 8 | 1:35 | 1:45 | 2:10 |
| 25 | B13 | B 8 | 1:50 | 2: 0 | 2:25 |
| 26 | A18 | A13 | 2: 5 | 2:15 | 2:40 |
| 27 | B18 | B13 | 2:20 | 2:30 | 2:55 |
| 28 | A23 | A18 | 2:35 | 2:45 | 3:10 |
| 29 | B23 | B18 | 2:50 | 3: 0 | 3:25 |
| 30 | A28 | A23 | 3: 5 | 3:15 | 3:40 |
| 31 | B28 | B23 | 3:20 | 3:30 | 3:55 |
| 32 | A33 | A28 | 3:35 | 3:45 | 4:10 |

TUE MAR 13 1990 8X 4 TURN

# PUSHING SCHEDULE FOR BATTERY B

| SEQ # | PUSH | CHARGE | EARLIEST TIME | DESIRED TIME | LATEST TIME | PM |
|---|---|---|---|---|---|---|
| 1 | B33 | B28 | 3:50 | 4: 0 | 4:25 | 1 |
| 2 | A38 | A33 | 4: 4 | 4:14 | 4:39 | 1 |
| 3 | A 5 | B33 | 4:18 | 4:28 | 4:53 | 1 |
| 4 | B 5 | A38 | 4:32 | 4:42 | 5: 7 | 1 |
| 5 | A10 | A 5 | 4:46 | 4:56 | 5:21 | 1 |
| 6 | B10 | B 5 | 5: 0 | 5:10 | 5:35 | 1 |
| 7 | A15 | A10 | 5:14 | 5:24 | 5:49 | 1 |
| 8 | B15 | B10 | 5:28 | 5:38 | 6: 3 | 1 |
| 9 | A20 | A15 | 5:42 | 5:52 | 6:17 | 1 |
| 10 | B20 | B15 | 5:57 | 6: 7 | 6:32 | 1 |
| 11 | A25 | A20 | 6:11 | 6:21 | 6:46 | 1 |
| 12 | B25 | B20 | 6:25 | 6:35 | 7: 0 | 1 |
| 13 | A30 | A25 | 6:39 | 6:49 | 7:14 | 1 |
| 14 | B30 | B25 | 6:53 | 7: 3 | 7:28 | 1 |
| 15 | A35 | A30 | 7: 7 | 7:17 | 7:42 | 1 |
| 16 | B35 | B30 | 7:21 | 7:31 | 7:56 | 1 |
| 17 | A 2 | A35 | 7:35 | 7:45 | 8:10 | 1 |
| 18 | B 2 | B35 | 7:50 | 8: 0 | 8:25 | 1 |
| 19 | A 7 | A 2 | 8: 4 | 8:14 | 8:39 | 1 |
| 20 | B 7 | B 2 | 8:18 | 8:28 | 8:53 | 1 |
| 21 | A12 | A 7 | 8:32 | 8:42 | 9: 7 | 1 |
| 22 | B12 | B 7 | 8:46 | 8:56 | 9:21 | 1 |
| 23 | A17 | A12 | 9: 0 | 9:10 | 9:35 | 1 |
| 24 | B17 | B12 | 9:14 | 9:24 | 9:49 | 1 |
| 25 | A22 | A17 | 9:28 | 9:38 | 10: 3 | 1 |
| 26 | B22 | B17 | 9:42 | 9:52 | 10:17 | 1 |
| 27 | A27 | A22 | 9:57 | 10: 7 | 10:32 | 1 |
| 28 | B27 | B22 | 10:11 | 10:21 | 10:46 | 1 |
| 29 | A32 | A27 | 10:25 | 10:35 | 11: 0 | 1 |
| 30 | B32 | B27 | 10:39 | 10:49 | 11:14 | 1 |
| 31 | A37 | A32 | 10:53 | 11: 3 | 11:28 | 1 |
| 32 | B37 | B32 | 11: 7 | 11:17 | 11:42 | 1 |
| 33 | A 4 | A37 | 11:21 | 11:31 | 11:56 | 1 |
| 34 | B 4 | B37 | 11:35 | 11:45 | 12:10 | 1 |

TUE MAR 13 1990 4X12 TURN

1.000.0088
85

# PUSHING AND CHARGING REPORT

"B" BATTERY

A-01

DATE 3-13-90

| PUSH | | CHARGE | | CLEAN CHUCK DOOR | COMMENTS | PUSH | | CHARGE | | CLEAN CHUCK DOOR | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 9:12 | A34 | 8:53 | A6 | | B1 | 9:25 | B34 | 9:07 | B6 | |
| A6 | 9:34 | A1 | 9:42 | A11 | | B6 | 9:53 | B1 | 9:59 | B11 | |
| A11 | 10:07 | A6 | 10-15 | A16 | | B11 | 10-20 | B6 | 10-27 | B16 | |
| A16 | 10-34 | A11 | 10-37 | A21 | | B16 | 10-44 | B11 | 10:50 | B21 | |
| A21 | 10-56 | A16 | 10-59 | A26 | | B21 | 11-09 | B16 | 11-19 | B26 | |
| A26 | 11-23 | A21 | 11-29 | A31 | | B26 | 11-35 | B21 | 11-41 | B31 | |
| A31 | 11-46 | A26 | 11-48 | A36 | | B31 | 11-58 | B26 | 0-59 | B36 | |
| A36 | | A31 | | B3 | | B36 | | B31 | | | |
| A3 | | A36 | | A8 | | B3 | | B36 | | B8 | |
| A8 | | A3 | | A13 | | B8 | | B3 | | B13 | |
| A13 | | A8 | | A18 | | B13 | | B8 | | B18 | |
| A18 | | A13 | | A23 | | B18 | | B13 | | B23 | |
| A23 | | A18 | | A28 | | B23 | | B18 | | B28 | |
| A28 | | A23 | | A33 | | B28 | | B23 | | B33 | |
| A33 | | A28 | | A38 | | B33 | | B28 | | | |
| A38 | | A33 | | B5 | | | | | | | |
| A5 | | B33 | | A10 | | B5 | | A38 | | B10 | |
| A10 | | A5 | | A15 | | B10 | | B5 | | B15 | |
| A15 | | A10 | | A20 | | B15 | | B10 | | B20 | |
| A20 | | A15 | | A25 | | B20 | 1207 | B15 | 1209 | B25 | |
| A25 | 1217 | A20 | 1217 | A30 | | B25 | 1228 | B20 | 1229 | B30 | |
| A30 | 1239 | A25 | 1240 | A35 | | B30 | 1250 | B25 | 1254 | B35 | |
| A35 | 108 | A30 | 110 | B2 | | B35 | 120 | B30 | 123 | | |
| A2 | 133 | A35 | 137 | A7 | | B2 | 147 | B35 | 152 | B7 | |
| A7 | 200 | A2 | 202 | A12 | | B7 | 212 | B2 | 214 | B12 | |
| A12 | 225 | A7 | 225 | A17 | | B12 | 239 | B7 | 239 | B17 | |
| A17 | 253 | A12 | 253 | A22 | | B17 | 307 | B12 | 307 | B22 | |
| A22 | 321 | A17 | 3:22 | A27 | | B22 | 3:35 | B17 | 335 | B27 | |
| A27 | 3:50 | A22 | 3:51 | A32 | | B27 | 4:04 | B22 | 4:04 | B32 | |
| A32 | 4:18 | A27 | 419 | A37 | | B32 | 432 | B27 | 432 | B37 | |
| A37 | 446 | A32 | 446 | B4 | | B37 | 500 | B32 | 500 | | |
| A4 | 514 | A37 | 510 | A9 | | B4 | 528 | B37 | 524 | B9 | |
| A9 | 542 | A4 | 542 | A14 | | B9 | 557 | B4 | 557 | B14 | |
| A14 | 611 | A9 | 611 | A19 | | B14 | 625 | B9 | 625 | B19 | |
| A19 | 639 | A14 | 639 | A24 | | B19 | 653 | B14 | 653 | B24 | |
| A24 | 707 | A19 | 707 | A29 | | B24 | 721 | B19 | 721 | B29 | |
| A29 | 735 | A24 | 735 | A34 | | B29 | 8:08 | B24 | 8:17 | B34 | |
| A34 | 8:23 | A29 | 8:30 | B1 | | B34 | 8:34 | B29 | 8:37 | | |
| | 25/25 | | | | | | 26/26 | | | | |

| TIME A.M. | P | C |
|---|---|---|
| 12-1 | 5 | 5 |
| 1-2 | 4 | 4 |
| 2-3 | 5 | 5 |
| 3-4 | 4 | 4 |
| 4-5 | 4 | 4 |
| 5-6 | 5 | 5 |
| 6-7 | 4 | 4 |
| 7-8 | 3 | 3 |
| 8-9 | 3 | 4 |
| 9-10 | 4 | 3 |
| 10-11 | 5 | 5 |
| 11-12 | 5 | 5 |

| TIME P.M. | P | C |
|---|---|---|
| 12-1 | | |
| 1-2 | | |
| 2-3 | | |
| 3-4 | | |
| 4-5 | | |
| 5-6 | | |
| 6-7 | | |
| 7-8 | | |
| 8-9 | | |
| 9-10 | | |
| 10-11 | | |
| 11-12 | | |

| TOTALS | P | |
|---|---|---|
| 12x8 | 34 | 3 |
| 8x4 | 17 | 1 |
| 4x12 | | |
| Total | 51 | 5 |

FOREMAN

12x8 Sowder

8x4 Smith

4x12-

CLEAN A-1, A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH

3.000.0088
/89

# PUSHING AND CHARGING REPORT

"B" BATTERY

PM

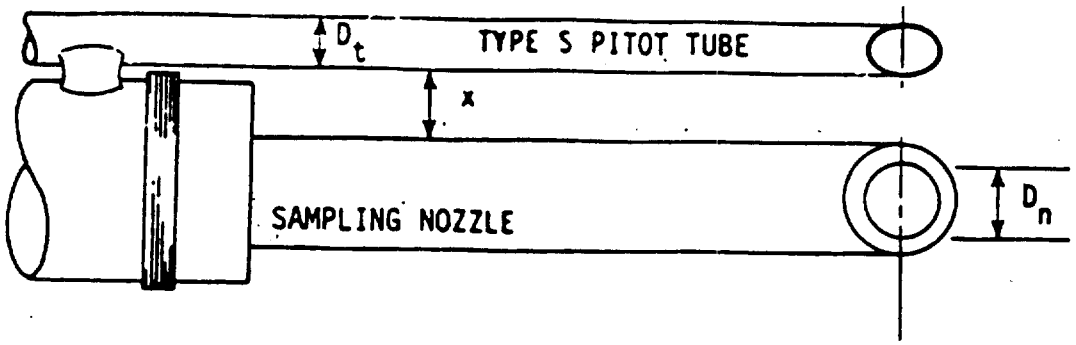
DATE 3-13-90

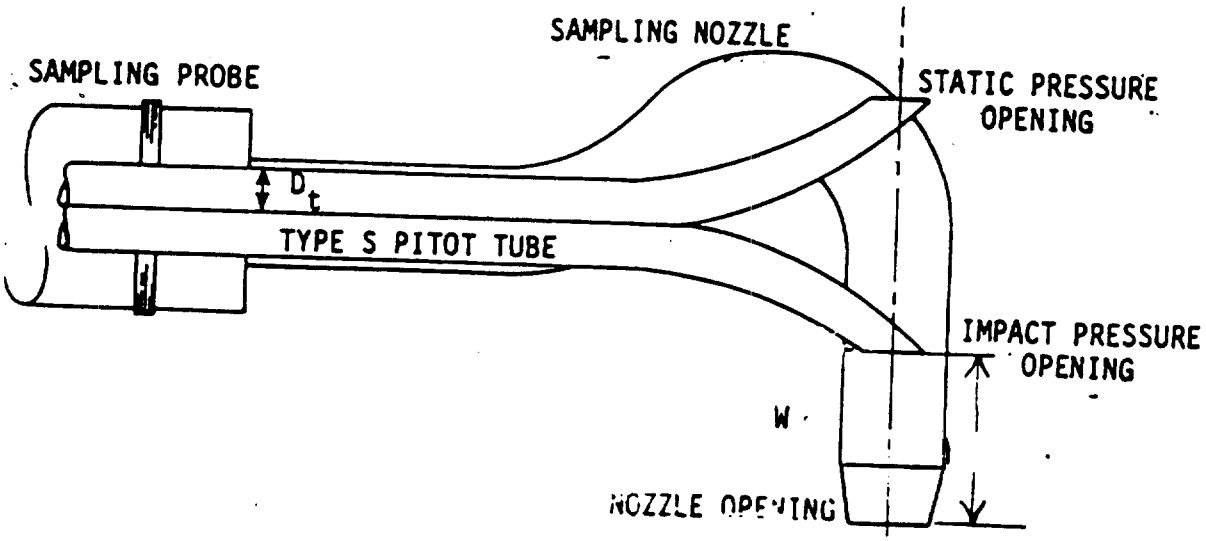
| PUSH | | CHARGE | | CLEAN CHUCK DOOR | COMMENTS | PUSH | | CHARGE | | CLEAN CHUCK DOOR | COMMENTS | TIME A.M. | P | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | | A34 | | A6 | | B1 | | B34 | | B6 | | 12-1 | | |
| A6 | | A1 | | A11 | | B6 | | B1 | | B11 | | 1-2 | | |
| A11 | | A6 | | A16 | | B11 | | B6 | | B16 | | 2-3 | | |
| A16 | | A11 | | A21 | | B16 | | B11 | | B21 | | 3-4 | | |
| A21 | | A16 | | A26 | | B21 | | B16 | | B26 | | 4-5 | | |
| A26 | | A21 | | A31 | | B26 | | B21 | | B31 | | 5-6 | | |
| A31 | | A26 | | A36 | | B31 | | B26 | | B36 | | 6-7 | | |
| A36 | 12:13 | A31 | 12:13 | B3 | | B36 | 12:24 | B31 | 12:22 | | | 7-8 | | |
| B3 | 12:37 | A36 | 12:40 | A8 | | B3 | 12:46 | B36 | 12:38 | B6 | | 8-9 | | |
| A8 | 1:13 | A3 | 1:14 | A13 | | B6 | 1:26 | B3 | 1:27 | B13 | | 9-10 | | |
| A13 | 1:36 | A8 | 1:39 | A18 | | B13 | 1:48 | B6 | 1:52 | B18 | | 10-11 | | |
| A18 | 2:05 | A13 | 2:03 | A23 | | B18 | 2:20 | B13 | 2:25 | B23 | | 11-12 | | |
| A23 | 2:35 | A18 | 2:30 | A28 | | B23 | 2:50 | B18 | 2:46 | B28 | | | | |
| A28 | 3:05 | A23 | 3:00 | A33 | | B28 | 3:20 | B23 | 3:16 | B33 | | TIME P.M. | P | C |
| A33 | 3:33 | A28 | 3:30 | A38 | | B33 | 4:10 | B28 | 4:10 | | | 12-1 | 4 | 4 |
| A38 | 4:25 | A33 | 4:25 | B5 | | | | | | | | 1-2 | 4 | 4 |
| A5 | — | B33 | 4:52 | A10 | | B5 | 4:40 | A38 | 5:00 | B10 | | 2-3 | 4 | 4 |
| A10 | 4:50 | A5 | — | A15 | | B10 | 5:05 | B5 | 5:15 | B15 | | 3-4 | 3 | 3 |
| A15 | 5:20 | A10 | 5:22 | A20 | | B15 | 5:35 | B10 | 5:38 | B20 | | 4-5 | 4 | 3 |
| A20 | 5:55 | A15 | 5:56 | A25 | | B20 | 6:00 | B15 | 6:01 | B25 | | 5-6 | 4 | 5 |
| A25 | 6:15 | A20 | 6:15 | A30 | | B25 | 6:27 | B20 | 6:27 | B30 | | 6-7 | 5 | 4 |
| A30 | 6:35 | A25 | 6:37 | A35 | | B30 | 6:53 | B25 | 6:58 | B35 | | 7-8 | 4 | 4 |
| A35 | 7:07 | A30 | 7:10 | B2 | | B35 | 7:21 | B30 | 7:20 | | | 8-9 | 4 | 4 |
| A2 | 7:35 | A35 | 7:37 | A7 | | B2 | 7:50 | B35 | 7:49 | B7 | | 9-10 | 5 | 5 |
| A7 | 8:09 | A2 | 8:05 | A12 | | B7 | 8:19 | B2 | 8:19 | B12 | | 10-11 | 4 | 4 |
| A12 | 8:32 | A7 | 8:33 | A17 | | B12 | 8:46 | B7 | 8:47 | B17 | | 11-12 | 3 | 3 |
| A17 | 9:00 | A12 | 9:01 | A22 | | B17 | 9:14 | B12 | 9:15 | B22 | | TOTALS | | |
| A22 | 9:28 | A17 | 9:29 | A27 | | B22 | 9:42 | B17 | 9:43 | B27 | | | P | C |
| A27 | 9:57 | A22 | 9:58 | A32 | | B27 | 10:11 | B22 | 10:12 | B32 | | 12x8 | | |
| A32 | 10:25 | A27 | 10:27 | A37 | | B32 | 10:39 | B27 | 10:40 | B37 | | 8x4 | 15 | 15 |
| A37 | 10:53 | A32 | 10:54 | B4 | | B37 | 11:09 | B32 | 11:10 | | | 4x12 | 33 | 33 |
| A4 | 11:21 | A37 | 11:22 | A9 | | B4 | 11:35 | B37 | 11:32 | B9 | | Total | 48 | 48 |
| A9 | | A4 | | A14 | | B9 | | B4 | | B14 | | | | |
| A14 | | A9 | | A19 | | B14 | | B9 | | B19 | | | | |
| A19 | | A14 | | A24 | | B19 | | B14 | | B24 | | FOREMAN | | |
| A24 | | A19 | | A29 | | B24 | | B19 | | B29 | | 12x8 - | | |
| A29 | | A24 | | A34 | | B29 | | B24 | | B34 | | 8x4 - | | |
| A34 | | A29 | | B1 | | B34 | | B29 | | | | 4x12- | | |

LEAN A-1, A-2, A-3, A-4, A-5 CHUCK DOORS BEFORE REMOVING FOR PUSH

# APPENDIX C

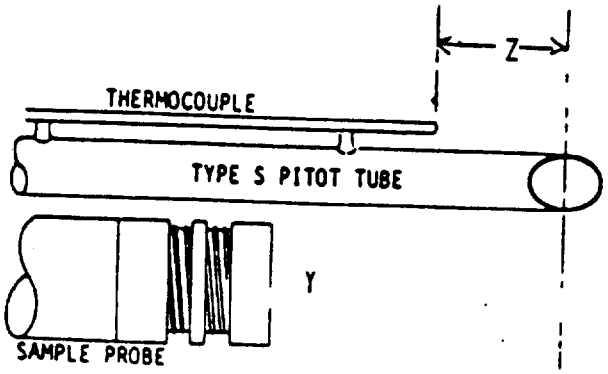
# PRE-TEST AND POST-TEST CALIBRATION AND AUDIT RESULTS




$D_n$ = Nozzle diameter

$D_t$ = 3/16 to 3/8"




$W \geq 0$

$X \geq 3/4"$ for 1/2" Nozzle

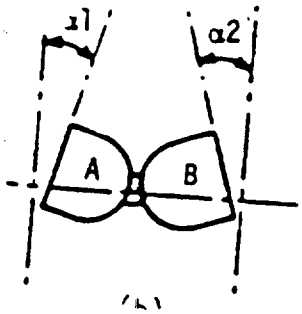
$Y \geq 3"$

$Z \geq 2"$

GEOMETRIC PITOT CALIBRATION

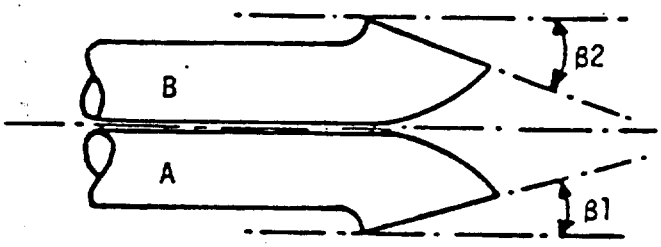
Probe No. 5-2
Date 2-26-90
Initials ERH

Pre-Test

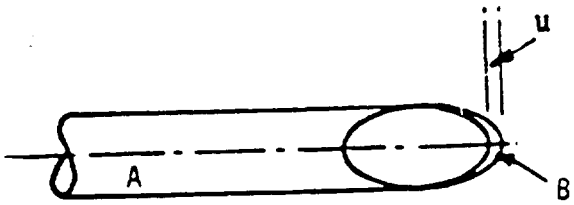



α1, α2 <10°

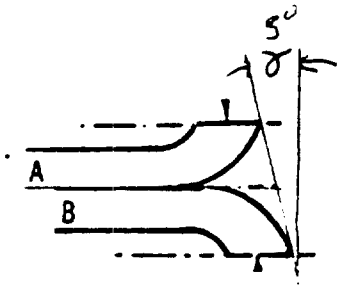
α1 = 3°
α2 = 1°
β1 = 2°
β2 = 1°
A = .987
μ = .086
V = .017
W = >0
X = 1.040
Y = 73"
Z = 72"
$D_t$ = .377




β1, β2 <5

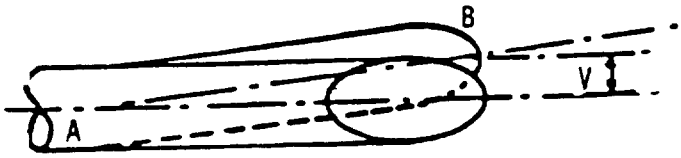


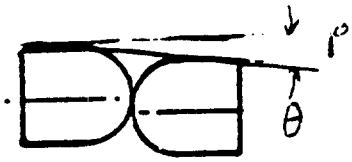

(f)



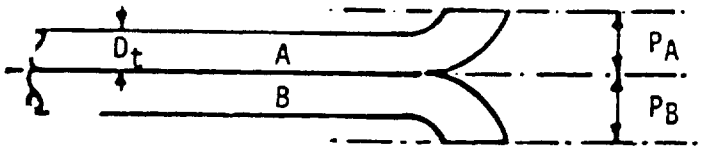

μ = A SIN γ

V = A SIN θ




A-SIDE PLANE




B-SIDE PLANE

.396 .566

$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

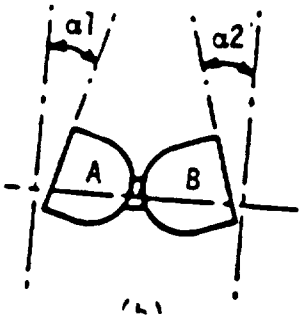
$2.10\ D_t < A < 3.00\ D_t$

.792 1.31

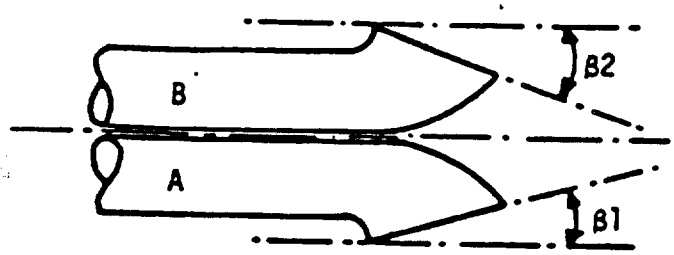
GEOMETRIC PITOT CALIBRATION

Probe No. 5-2
Date 4-3-90
Initials [illegible]
post check

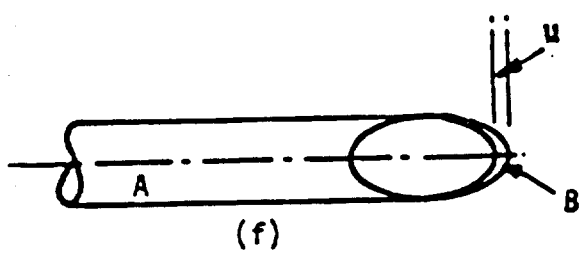
$\alpha 1$ = 3°
$\alpha 2$ = 1°
$\beta 1$ = 3°
$\beta 2$ = 0°
A = .970
$\mu$ = .050
V = .034
W = ≥0
X = 1.034
Y = ≥3"
Z = ≥2"
$D_t$ = .377



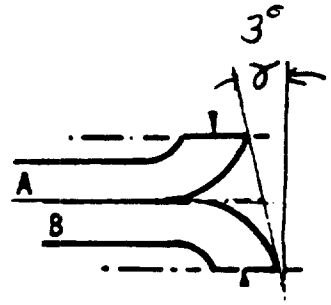

$\alpha 1, \alpha 2 < 10°$




$\beta 1, \beta 2 < 5$

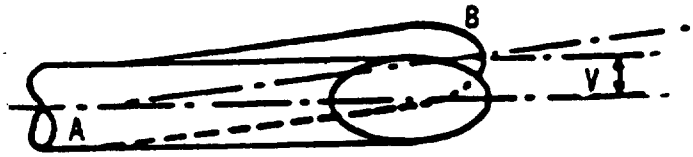


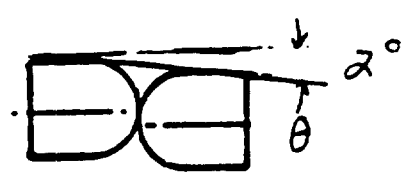

(f)



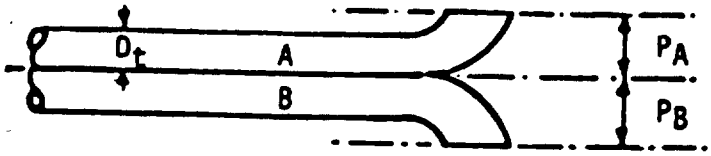

$\mu = A \sin \gamma$

$V = A \sin \Theta$




A-SIDE PLANE




B-SIDE PLANE

.395 .566

$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

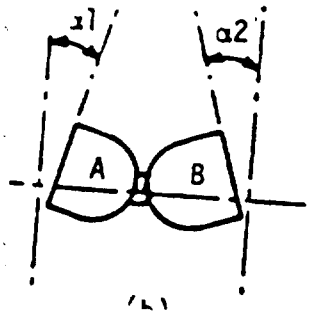
$2.10\ D_t < A < 3.00\ D_t$

.792 1.131

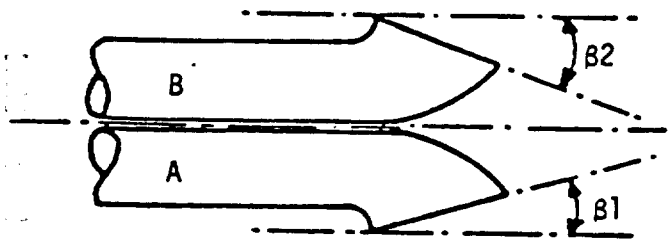
GEOMETRIC PITOT CALIBRATION

Probe No. 5-3
Date 2-26-90
Initials [illegible]
Pre-Test

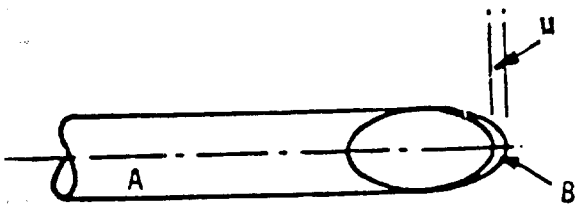
$\alpha 1$ = 1°
$\alpha 2$ = 3°
$\beta 1$ = 3°
$\beta 2$ = 0°
A = .855
$\mu$ = .015
V = .059
W = 70
X = .820
Y = 73"
Z = 72"
$D_t$ = .377



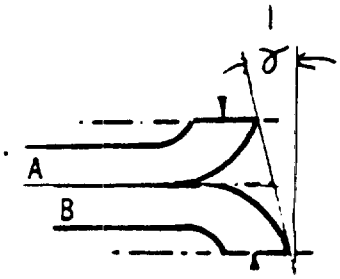

$\alpha 1, \alpha 2 < 10°$




$\beta 1, \beta 2 < 5$

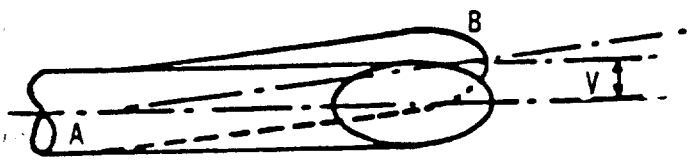


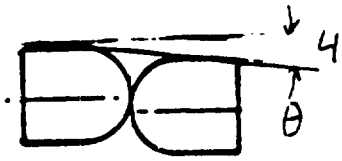

(f)



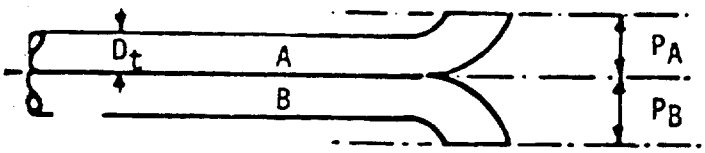

$\mu = A \sin \gamma$

$V = A \sin \Theta$




A-SIDE PLANE



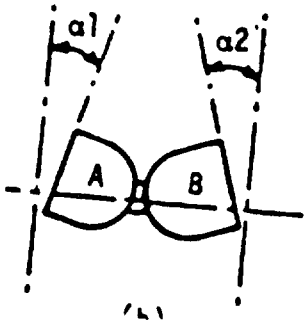

B-SIDE PLANE

.396 .566
$1.05\ D_t < P < 1.50\ D_t$
$P_A = P_B$
$2.10\ D_t < A < 3.00\ D_t$
.792 1.131

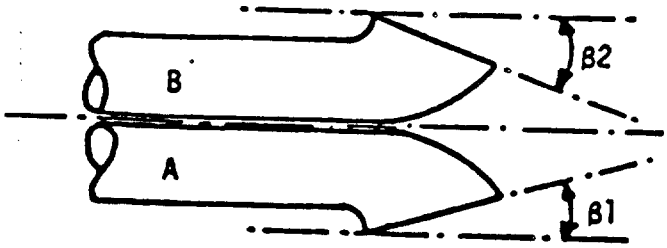
# GEOMETRIC PITOT CALIBRATION

Probe No. 5-3
Date 4.3.90
Initials [illegible]
post check

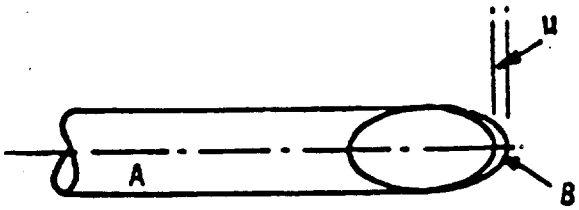
α1 = 5°
α2 = 4°
β1 = 1°
β2 = 2°
A = .850
μ = .030
V = .074
W = > 0
X = .939
Y = ≥ 3"
Z = ≥ 2"
$D_t$ = .377



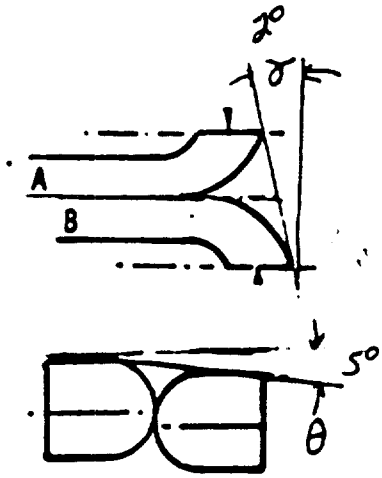

α1, α2 <10°




β1, β2 <5

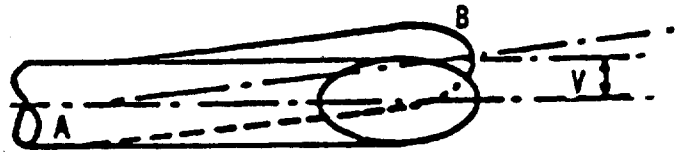



(f)

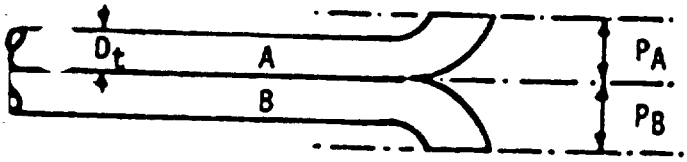



μ = A SIN γ

V = A SIN θ




A-SIDE PLANE




B-SIDE PLANE

.396 .566

1.05 $D_t$ <P <1.50 $D_t$

$P_A = P_B$

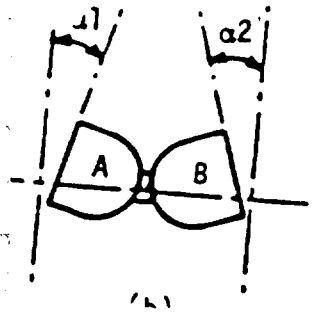
2.10 $D_t$ <A <3.00 $D_t$

.792 1.131

# GEOMETRIC PITOT CALIBRATION

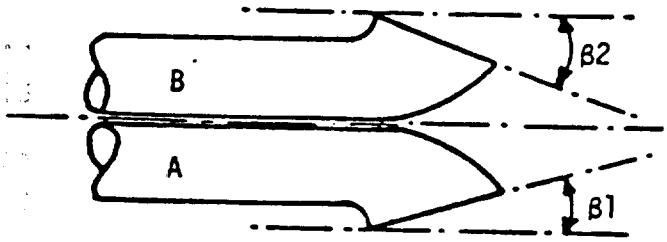
Probe No. S-4
Date 2-26-90
Initials [illegible]

Pre-Test

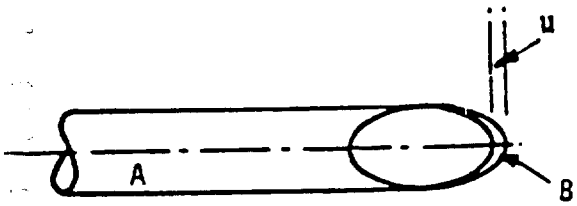



α1, α2 <10°

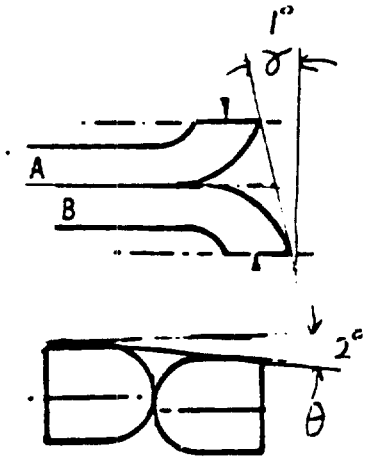
α1 = 1°
α2 = 0°
β1 = 3°
β2 = 1°
A = .870
μ = .015
V = .030
W = >0
X = .995
Y = >3"
Z = >2"
$D_t$ = .372




β1, β2 <5

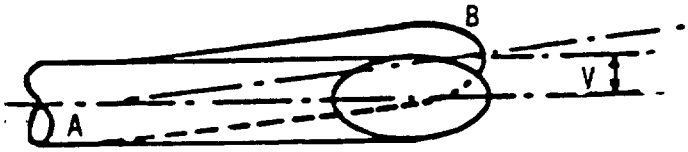



(f)

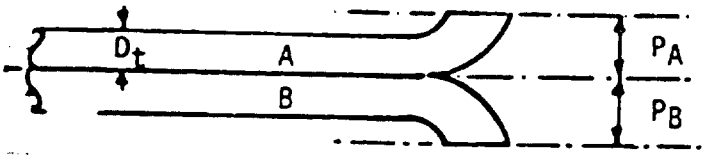



μ = A SIN γ

V = A SIN θ




S-SIDE PLANE




S-SIDE PLANE

.390 .560

$1.05\ D_t < P < 1.50\ D_t$

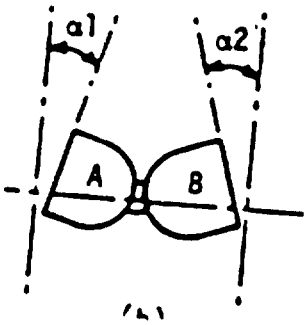
$P_A = P_B$

$2.10\ D_t < A < 3.00\ D_t$

.781 1.116

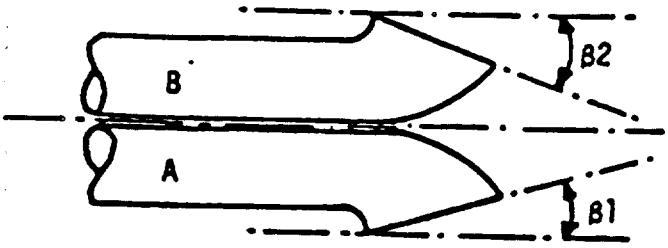
GEOMETRIC PITOT CALIBRATION

Probe No. 5-4
Date 4-3-90
Initials [illegible]
POST CHECK

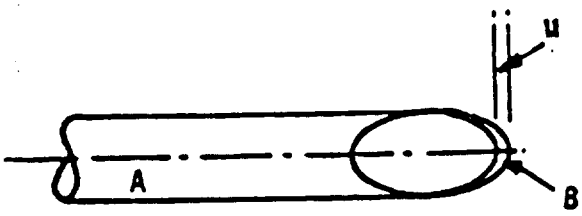



α1, α2 <10°

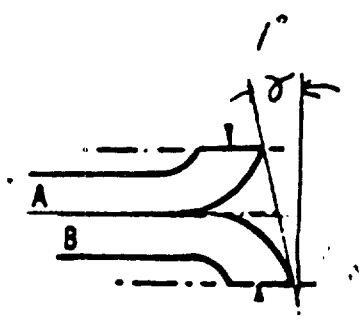
α1 = 1°
α2 = 3°
β1 = 2°
β2 = 1°
A = .877
μ = .015
V = .031
W = >0
X = .935
Y = >3"
Z = >2"
$D_t$ = .372




β1, β2 <5

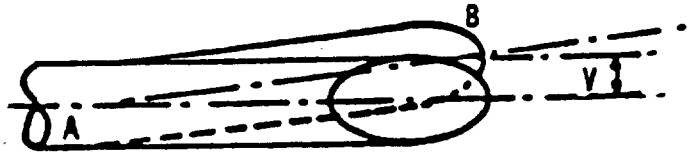


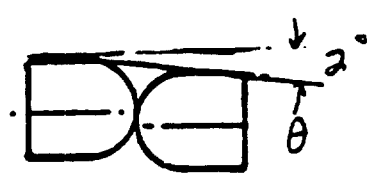

(f)



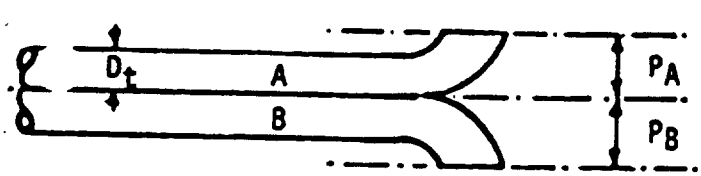

μ = A SIN γ

V = A SIN θ




A-SIDE PLANE




B-SIDE PLANE

.391 .559

$1.05\ D_t < P < 1.50\ D_t$

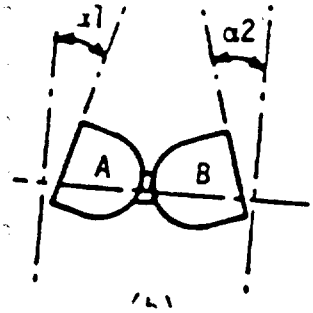
$P_A = P_B$

$2.10\ D_t < A < 3.00\ D_t$

.781 1.116

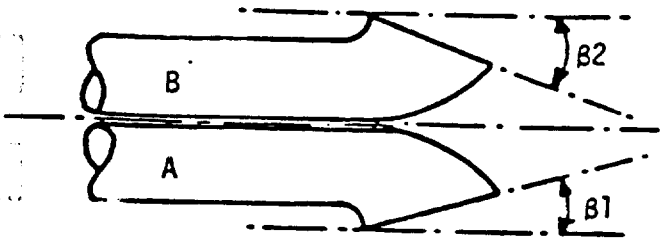
# GEOMETRIC PITOT CALIBRATION

Probe No. 5-5
Date 2-26-90
Initials DRK
Pre-Test

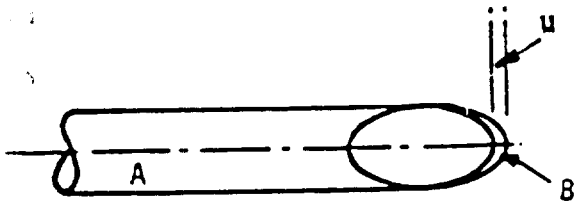



α1, α2 <10°

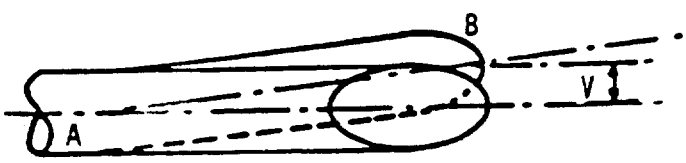
α1 = 1°
α2 = 1°
β1 = 2°
β2 = 1°
A = .865
μ = 1.075
V = .015
W = 70
X = 1.080
Y = 73"
Z = 72"
$D_t$ = .375

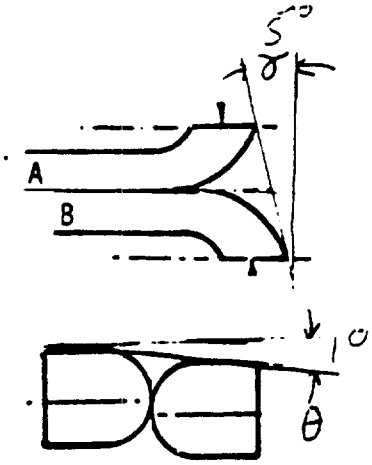



β1, β2 <5



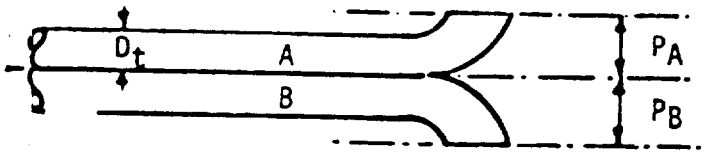

(f)




μ = A SIN ϑ

V = A SIN Θ




B-SIDE PLANE

.394 .563

1.05 $D_t$ <P <1.50 $D_t$

$P_A$ = $P_B$

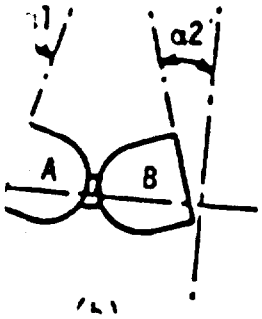
2.10 $D_t$ <A <3.00 $D_t$

.787 1.125

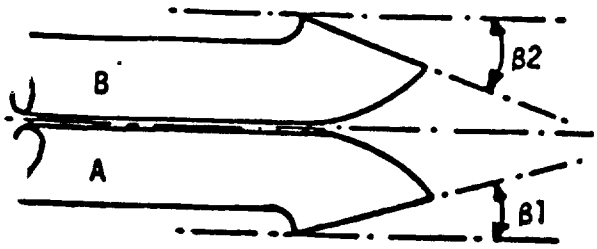
# GEOMETRIC PITOT CALIBRATION

Probe No. 5.5
Date 4.3.90
Initials [illegible]
post check

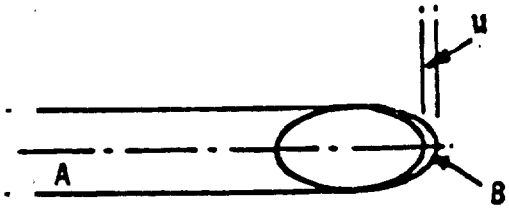
α1 = 1°
α2 = 1°
β1 = 1°
β2 = 1°
A = .874
μ = .061
V = .015
W = ≥0
X = 1.124
Y = .078
Z = .020
$D_t$ = .372



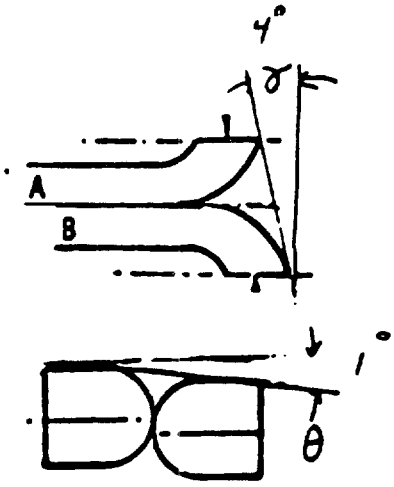

α1, α2 <10°




β1, β2 <5

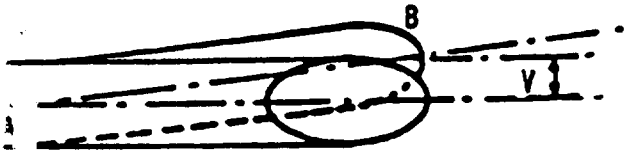



(f)

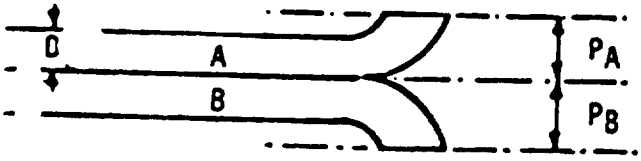



μ = A SIN γ

V = A SIN θ




A-SIDE PLANE




B-SIDE PLANE

$1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

$2.10\ D_t < A < 3.00\ D_t$

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX NO. 1
DATE 12-27-89
BP 29.02
OPERATOR DRK

| | TIME | WET TEST METER TEMP $T_W$ | VOLUME $V_M$ | PRESSURE $P_W$ | $T_I$ | $T_O$ | DRY TEST METER TEMP IN $T_A$ | TEMP OUT $P_D$ | $V_D$ | TEMP AVG Y | ORIFICE $H_@$ | VOLUME | METER CORRECT | ORIFICE COEIFFICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START | | | | 0.000 | | 29.02 | | | | | 0.50 | 7.300 | | |
| HALF | | | 74.0 | | | | 82.0 | | 74.0 | 78.0 | | | | |
| STOP | 12.78 | | | 5.000 | | | | | | | | 12.256 | | |
| CALCULATION | 12.78 | | 534.0 | 5.057 | | 29.02 | | | | 538.0 | 29.06 | 4.956 | 1.0266 | 1.849 |
| START | | | | 0.000 | | 29.02 | | | | | 1.00 | 12.700 | | |
| HALF | | | 74.0 | | | | 89.0 | | 77.0 | 83.0 | | | | |
| STOP | 8.90 | | | 5.000 | | | | | | | | 17.675 | | |
| CALCULATION | 8.90 | | 534.0 | 5.057 | | 29.02 | | | | 543.0 | 29.09 | 4.975 | 1.0309 | 1.777 |
| START | | | | 0.000 | | 29.02 | | | | | 2.00 | 18.100 | | |
| HALF | | | 74.0 | | | | 92.0 | | 79.0 | 85.5 | | | | |
| STOP | 6.18 | | | 5.000 | | | | | | | | 23.006 | | |
| CALCULATION | 6.18 | | 534.0 | 5.057 | | 29.02 | | | | 545.5 | 29.17 | 4.906 | 1.0476 | 1.706 |
| AVERAGE | | | | | | | | | | | | | 1.0350 | 1.777 |

POST TEST

BOX NO. 1
DATE 4-5-90
BP 28.55
OPERATOR DRK

| | TIME | WET TEST METER TEMP $T_W$ | VOLUME $V_M$ | $P_W$ | PRESSURE $T_I$ | $T_O$ | DRY TEST METER TEMP IN $T_A$ | TEMP OUT $P_D$ | $V_D$ | TEMP AVG Y | ORIFICE $H_@$ | VOLUME | METER CORRECT | ORIFICE COEIFFICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START | | | | 0.000 | | 28.55 | | | | | 1.00 | 261.800 | | |
| HALF | | | 75.0 | | | | 94.0 | | 87.0 | 90.5 | | | | |
| STOP | 8.60 | | | 5.000 | | | | | | | | 266.980 | | |
| CALCULATION | 8.60 | | 535.0 | 5.057 | | 28.55 | | | | 550.5 | 28.62 | 5.180 | 1.0019 | 1.670 |
| START | | | | 0.000 | | 28.55 | | | | | 1.00 | 267.000 | | |
| HALF | | | 75.0 | | | | 96.0 | | 88.0 | 92.0 | | | | |
| STOP | 8.65 | | | 5.015 | | | | | | | | 272.219 | | |
| CALCULATION | 8.65 | | 535.0 | 5.072 | | 28.55 | | | | 552.0 | 28.62 | 5.219 | 1.0001 | 1.675 |
| START | | | | 0.000 | | 28.55 | | | | | 1.00 | 272.300 | | |
| HALF | | | 75.0 | | | | 97.0 | | 89.0 | 93.0 | | | | |
| STOP | 8.63 | | | 5.000 | | | | | | | | 277.520 | | |
| CALCULATION | 8.63 | | 535.0 | 5.057 | | 28.55 | | | | 553.0 | 28.62 | 5.220 | 0.9987 | 1.674 |
| AVERAGE | | | | | | | | | | | | | 1.0002 | 1.673 |
| DIFFERENCE | | | | | | | | | | | | | 3.48% | 6.25% |

MAGNAHELIC CALIBRAATION

DATE 4-5-90

OPERATOR DRK

| P 0-10 | | P 0-.5 | | H | |
|---|---|---|---|---|---|
| MAGNEHILIC | MANOMETER | MAGNEHILIC | MANOMETER | MAGNEHILIC | MANOMETER |
| 0.50 | 0.50 | 0.50 | 0.50 | 4.00 | 4.00 |
| 1.00 | 1.00 | 0.40 | 0.40 | 3.00 | 3.00 |
| 2.00 | 2.00 | 0.30 | 0.30 | 2.00 | 2.00 |
| 4.00 | 4.00 | 0.20 | 0.20 | 1.00 | 1.00 |
| 6.00 | 6.00 | 0.10 | 0.10 | 0.50 | 0.50 |
| 8.00 | 8.00 | | | | |

LEAK CHECK

DATE 4-5-90

OPERATOR DRK

| | START CF | STOP CF | VOL | TIME | LEAK RATE |
|---|---|---|---|---|---|
| DRY | 730.915 | 731.115 | 0.200 | 10.000 | -0.001 |
| WET | 0.000 | 0.192 | 0.192 | | |

PYROMETER CALIBRATION

DATE 04-28-88

OPERATOR AGL

| mV input | temp °F | temp rdg °F |
|---|---|---|
| 0.18 | 40 | 40.0 |
| 0.40 | 50 | 50.0 |
| 0.84 | 70 | 70.0 |
| 1.29 | 90 | 90.0 |
| 1.74 | 110 | 110.0 |
| 2.66 | 150 | 150.0 |
| 3.82 | 200 | 200.0 |
| 6.09 | 300 | 301.0 |
| 8.31 | 400 | 400.0 |
| 10.57 | 500 | 500.0 |

PYROMETER CHECK

DATE 4-5-90

OPERATOR DRK

| mV input °F | temp °F | temp rdg |
|---|---|---|
| 0.18 | 40 | 40.0 |
| 0.40 | 50 | 50.0 |
| 0.84 | 70 | 70.0 |
| 1.29 | 90 | 90.0 |
| 1.74 | 110 | 110.0 |
| 2.66 | 150 | 150.0 |
| 3.82 | 200 | 200.0 |
| 6.09 | 301 | 300.0 |
| 8.31 | 400 | 400.0 |
| 10.57 | 500 | 500.0 |

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX NO. 2
DATE 12-27-89
BP 29.02
OPERATOR DRK

| | TIME | WET TEST METER TEMP $T_W$ | WET TEST METER VOLUME $V_M$ | WET TEST METER PRESSURE $P_W$ | $T_I$ | $T_O$ | DRY TEST METER TEMP IN $T_A$ | DRY TEST METER TEMP OUT $P_D$ | DRY TEST METER VOLUME $V_D$ | TEMP AVG Y | ORIFICE $H_a$ | VOLUME | METER CORRECT | ORIFICE COEIFFICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START | | | | 0.000 | | 29.02 | | | | | 0.50 | 372.800 | | |
| HALF | | | 74.0 | | | | 85.0 | | 78.0 | 81.5 | | | | |
| STOP | 11.16 | | | 5.000 | | | | | | | | 378.149 | | |
| CALCULATION | 11.16 | | 534.0 | 5.057 | | 29.02 | | | | 541.5 | 29.06 | 5.349 | 0.9574 | 1.401 |
| START | | | | 0.000 | | 29.02 | | | | | 1.00 | 378.700 | | |
| HALF | | | 74.0 | | | | 90.0 | | 80.0 | 85.0 | | | | |
| STOP | 8.33 | | | 5.000 | | | | | | | | 384.054 | | |
| CALCULATION | 8.33 | | 534.0 | 5.057 | | 29.02 | | | | 545.0 | 29.09 | 5.354 | 0.9615 | 1.551 |
| START | | | | 0.000 | | 29.02 | | | | | 2.00 | 384.500 | | |
| HALF | | | 74.0 | | | | 93.0 | | 81.0 | 87.0 | | | | |
| STOP | 6.00 | | | 5.000 | | | | | | | | 389.822 | | |
| CALCULATION | 6.00 | | 534.0 | 5.057 | | 29.02 | | | | 547.0 | 29.17 | 5.322 | 0.9683 | 1.604 |
| AVERAGE | | | | | | | | | | | | | 0.9624 | 1.519 |

POST TEST

BOX NO. 2
DATE 4-04-90
BP 28.75
OPERATOR DRK

| | TIME | WET TEST METER TEMP $T_W$ | VOLUME $V_M$ | $P_W$ | PRESSURE $T_I$ | $T_O$ | DRY TEST METER TEMP IN $T_A$ | TEMP OUT $P_D$ | $V_D$ | TEMP AVG Y | ORIFICE $H_@$ | VOLUME | METER CORRECT | ORIFICE COEIFFICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START | | | | 0.000 | | 28.75 | | | | | 1.00 | 160.900 | | |
| HALF | | | 76.0 | | | | 88.0 | | 79.0 | 83.5 | | | | |
| STOP | 8.25 | | | 5.000 | | | | | | | | 166.192 | | |
| CALCULATION | 8.25 | | 536.0 | 5.057 | | 28.75 | | | | 543.5 | 28.82 | 5.292 | 0.9664 | 1.552 |
| START | | | | 0.000 | | 28.75 | | | | | 1.00 | 166.300 | | |
| HALF | | | 76.0 | | | | 90.0 | | 80.0 | 85.0 | | | | |
| STOP | 8.28 | | | 5.000 | | | | | | | | 171.598 | | |
| CALCULATION | 8.28 | | 536.0 | 5.057 | | 28.75 | | | | 545.0 | 28.82 | 5.298 | 0.9680 | 1.559 |
| START | | | | 0.000 | | 28.75 | | | | | 1.00 | 171.700 | | |
| HALF | | | 76.0 | | | | 91.0 | | 82.0 | 86.5 | | | | |
| STOP | 8.28 | | | 5.000 | | | | | | | | 177.012 | | |
| CALCULATION | 8.28 | | 536.0 | 5.057 | | 28.75 | | | | 546.5 | 28.82 | 5.312 | 0.9681 | 1.554 |
| AVERAGE | | | | | | | | | | | | | 0.9675 | 1.555 |
| DIFFERENCE | | | | | | | | | | | | | -0.53% | -2.33% |

MAGNAHELIC CALIBRATION

DATE 4-04-90

OPERATOR DRK

| P 0-10 MAGNEHILIC | MANOMETER | P 0-.5 MAGNEHILIC | MANOMETER | H MAGNEHILIC | MANOMETER |
|---|---|---|---|---|---|
| 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 1 | 1 | 0.4 | 0.4 | 1 | 1 |
| 2 | 2 | 0.3 | 0.3 | 2 | 2 |
| 4 | 4 | 0.2 | 0.2 | 3 | 3 |
| 6 | 6 | 0.1 | 0.1 | 4 | 4 |
| 8 | 8 | | | | |

LEAK CHECK

DATE 4-04-90

OPERATOR DRK

| | START CF | STOP CF | VOL | TIME | LEAK RATE |
|---|---|---|---|---|---|
| DRY | 160.225 | 160.445 | 0.22 | 10.000 | -0.001 |
| WET | 0 | 0.21 | 0.21 | | |

PYROMETER CALIBRATION

DATE 7-19-89

OPERATOR PS/D

| mV input | temp °F | temp rdg °F |
|---|---|---|
| 0.18 | 40 | 40 |
| 0.40 | 50 | 50 |
| 0.84 | 70 | 70 |
| 1.29 | 90 | 90 |
| 1.74 | 110 | 110 |
| 2.66 | 150 | 150 |
| 3.82 | 200 | 200 |
| 6.09 | 300 | 300 |
| 8.31 | 400 | 400 |
| 10.57 | 500 | 500 |

PYROMETER CHECK

DATE 4-04-90

OPERATOR DRK

| mV input °F | temp °F | temp rdg |
|---|---|---|
| 0.18 | 40 | 40 |
| 0.40 | 50 | 50 |
| 0.84 | 70 | 70 |
| 1.29 | 90 | 90 |
| 1.74 | 110 | 110 |
| 2.66 | 150 | 150 |
| 3.82 | 200 | 200 |
| 6.09 | 300 | 300 |
| 8.31 | 400 | 400 |
| 10.57 | 500 | 500 |

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX NO. 3
DATE 12-28-89
BP 28.98
OPERATOR DRK

| | TIME | WET TEST METER TEMP $T_W$ | WET TEST METER VOLUME $V_M$ | WET TEST METER PRESSURE $P_W$ | DRY TEST METER PRESSURE $T_I$ | DRY TEST METER PRESSURE $T_O$ | DRY TEST METER TEMP IN $T_A$ | DRY TEST METER TEMP OUT $P_D$ | DRY TEST METER VOLUME $V_D$ | TEMP AVG $Y$ | ORIFICE $H_a$ | VOLUME | METER CORRECT | ORIFICE COEIFFICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START | | | | 0.000 | | 28.98 | | | | | 0.50 | 817.100 | | |
| HALF | | | 76.0 | | | | 90.0 | | 76.0 | 83.0 | | | | |
| STOP | 11.87 | | | 5.000 | | | | | | | | 822.370 | | |
| CALCULATION | 11.87 | | 536.0 | 5.057 | | 28.98 | | | | 543.0 | 29.02 | 5.270 | 0.9708 | 1.579 |
| START | | | | 0.000 | | 28.98 | | | | | 1.00 | 822.600 | | |
| HALF | | | 76.0 | | | | 96.0 | | 78.0 | 87.0 | | | | |
| STOP | 8.62 | | | 5.000 | | | | | | | | 827.874 | | |
| CALCULATION | 8.62 | | 536.0 | 5.057 | | 28.98 | | | | 547.0 | 29.05 | 5.274 | 0.9760 | 1.670 |
| START | | | | 0.000 | | 28.98 | | | | | 2.00 | 828.400 | | |
| HALF | | | 76.0 | | | | 101.0 | | 79.0 | 90.0 | | | | |
| STOP | 6.08 | | | 5.000 | | | | | | | | 833.633 | | |
| CALCULATION | 6.08 | | 536.0 | 5.057 | | 28.98 | | | | 550.0 | 29.13 | 5.233 | 0.9865 | 1.652 |
| AVERAGE | | | | | | | | | | | | | 0.9778 | 1.634 |

POST TEST

BOX NO. 3
DATE 4-5-90
BP 28.55
OPERATOR DRK

| | TIME | WET TEST METER TEMP $T_W$ | WET TEST METER VOLUME $V_M$ | PRESSURE $P_W$ | $T_I$ | $T_O$ | DRY TEST METER TEMP IN $T_A$ | TEMP OUT $P_D$ | TEMP AVG $V_D$ | ORIFICE Y | ORIFICE $H_@$ | VOLUME | METER CORRECT | ORIFICE COEIFFICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START | | | | 0.000 | | 28.55 | | | | | 1.00 | 634.400 | | |
| HALF | | | 75.0 | | | | 99.0 | 82.0 | 90.5 | | | | | |
| STOP | 8.73 | | | 5.000 | | | | | | | | 639.705 | | |
| CALCULATION | 8.73 | | 535.0 | 5.057 | | 28.55 | | | | 550.5 | 28.62 | 5.305 | 0.9783 | 1.721 |
| START | | | | 0.000 | | 28.55 | | | | | 1.00 | 639.800 | | |
| HALF | | | 75.0 | | | | 101.0 | 83.0 | 92.0 | | | | | |
| STOP | 8.75 | | | 5.000 | | | | | | | | 645.120 | | |
| CALCULATION | 8.75 | | 535.0 | 5.057 | | 28.55 | | | | 552.0 | 28.62 | 5.320 | 0.9782 | 1.724 |
| START | | | | 0.000 | | 28.55 | | | | | 1.00 | 645.200 | | |
| HALF | | | 75.0 | | | | 102.0 | 84.0 | 93.0 | | | | | |
| STOP | 8.75 | | | 5.000 | | | | | | | | 650.525 | | |
| CALCULATION | 8.75 | | 535.0 | 5.057 | | 28.55 | | | | 553.0 | 28.62 | 5.325 | 0.9790 | 1.721 |
| AVERAGE | | | | | | | | | | | | | 0.9785 | 1.722 |
| DIFFERENCE | | | | | | | | | | | | | -0.07% | -5.13% |

MAGNAHELIC CALIBRAATION

DATE 4-5-90

OPERATOR DRK

| P 0-10 | | P 0-.5 | | H | |
|---|---|---|---|---|---|
| MAGNEHILIC | MANOMETER | MAGNEHILIC | MANOMETER | MAGNEHILIC | MANOMETER |
| 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| 1.00 | 1.00 | 0.40 | 0.40 | 1.00 | 1.00 |
| 2.00 | 2.00 | 0.30 | 0.30 | 2.00 | 2.00 |
| 4.00 | 4.00 | 0.20 | 0.20 | 3.00 | 3.00 |
| 8.00 | 8.00 | 0.10 | 0.10 | 4.00 | 4.00 |

LEAK CHECK

DATE 4-5-90

OPERATOR DRK

| | START CF | STOP CF | VOL | TIME | LEAK RATE |
|---|---|---|---|---|---|
| DRY | 633.070 | 633.269 | 0.199 | 10.000 | 0.0001 |
| WET | 0.000 | 0.200 | 0.200 | | |

PYROMETER CALIBRATION

DATE 7-20-89

OPERATOR PS/D

| mV input | temp °F | temp rdg °F |
|---|---|---|
| 0.18 | 40 | 40 |
| 0.40 | 50 | 50 |
| 0.84 | 70 | 70 |
| 1.29 | 90 | 90 |
| 1.74 | 110 | 110 |
| 2.66 | 150 | 150 |
| 3.82 | 200 | 200 |
| 6.09 | 300 | 300 |
| 8.31 | 400 | 400 |
| 10.57 | 500 | 500 |

PYROMETER CHECK

DATE 4-5-90

OPERATOR DRK

| mV input °F | temp °F | temp rdg |
|---|---|---|
| 0.18 | 40 | 40 |
| 0.40 | 50 | 50 |
| 0.84 | 70 | 70 |
| 1.29 | 90 | 90 |
| 1.74 | 110 | 110 |
| 2.66 | 150 | 150 |
| 3.82 | 200 | 200 |
| 6.09 | 300 | 301 |
| 8.31 | 400 | 400 |
| 10.57 | 500 | 500 |

CONTROL BOX CALIBRATION

THREE POINT

BOX NO. 4
DATE 12-28-89
BP 28.98
OPERATOR DRK

| | TIME | WET TEST METER TEMP $T_W$ | WET TEST METER VOLUME $V_M$ | $P_W$ | PRESSURE $T_I$ | PRESSURE $T_O$ | DRY TEST METER TEMP IN $T_A$ | DRY TEST METER TEMP OUT $P_D$ | DRY TEST METER VOLUME $V_D$ | TEMP AVG Y | ORIFICE $H_a$ | VOLUME | METER CORRECT | ORIFICE COEIFFICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START | | | | 0.000 | | 28.98 | | | | | 0.50 | 280.100 | | |
| HALF | | | 76.0 | | | | 76.0 | | 75.0 | 75.5 | | | | |
| STOP | 11.87 | | | 5.000 | | | | | | | | 285.340 | | |
| CALCULATION | 11.87 | | 536.0 | 5.057 | | 28.98 | | | | 535.5 | 29.02 | 5.240 | 0.9629 | 1.617 |
| START | | | | 0.000 | | 28.98 | | | | | 1.00 | 285.900 | | |
| HALF | | | 89.0 | | | | 81.0 | | 78.0 | 79.5 | | | | |
| STOP | 8.63 | | | 5.000 | | | | | | | | 291.190 | | |
| CALCULATION | 8.63 | | 549.0 | 5.057 | | 28.98 | | | | 539.5 | 29.05 | 5.290 | 0.9369 | 1.780 |
| START | | | | 0.000 | | 28.98 | | | | | 2.00 | 296.600 | | |
| HALF | | | 76.0 | | | | 76.0 | | 76.0 | 76.0 | | | | |
| STOP | 6.23 | | | 5.000 | | | | | | | | 301.800 | | |
| CALCULATION | 6.23 | | 536.0 | 5.057 | | 28.98 | | | | 536.0 | 29.13 | 5.200 | 0.9675 | 1.780 |
| AVERAGE | | | | | | | | | | | | | 0.9558 | 1.726 |

POST TEST

BOX NO. 4
DATE 4-05-90
BP 28.55
OPERATOR TJM

| | TIME | WET TEST METER TEMP $T_W$ | VOLUME $V_M$ | PRESSURE $P_W$ | $T_I$ | $T_O$ | DRY TEST METER TEMP IN $T_A$ | TEMP OUT $P_D$ | $V_D$ | TEMP AVG Y | ORIFICE $H_@$ | VOLUME | METER CORRECT | ORIFICE COEIFFICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START | | | | 0.000 | | 28.55 | | | | | 1.20 | 121.495 | | |
| HALF | | | 74.0 | | | | 85.0 | | 85.0 | 85.0 | | | | |
| STOP | 8.25 | | | 5.000 | | | | | | | | 126.681 | | |
| CALCULATION | 8.25 | | 534.0 | 5.057 | | 28.55 | | | | 545.0 | 28.64 | 5.186 | 0.9920 | 1.856 |
| START | | | | 0.000 | | 28.55 | | | | | 1.20 | 127.370 | | |
| HALF | | | 74.0 | | | | 87.0 | | 86.0 | 86.5 | | | | |
| STOP | 8.30 | | | 5.000 | | | | | | | | 132.666 | | |
| CALCULATION | 8.30 | | 534.0 | 5.057 | | 28.55 | | | | 546.5 | 28.64 | 5.296 | 0.9741 | 1.873 |
| START | | | | 0.000 | | 28.55 | | | | | 1.20 | 133.710 | | |
| HALF | | | 74.0 | | | | 88.0 | | 87.0 | 87.5 | | | | |
| STOP | 8.30 | | | 5.000 | | | | | | | | 139.000 | | |
| CALCULATION | 8.30 | | 534.0 | 5.057 | | 28.55 | | | | 547.5 | 28.64 | 5.290 | 0.9770 | 1.870 |
| AVERAGE | | | | | | | | | | | | | 0.9811 | 1.866 |
| DIFFERENCE | | | | | | | | | | | | | -2.58% | -7.53% |

MAGNAHELIC CALIBRAATION

DATE ~~2-27-90~~ 4-5-90

OPERATOR DRK

| P 0-10 | | P 0-.5 | | H | |
|---|---|---|---|---|---|
| MAGNEHILIC | MANOMETER | MAGNEHILIC | MANOMETER | MAGNEHILIC | MANOMETER |
| 0.50 | 0.50 | 0.50 | 0.50 | 4.00 | 4.05 |
| 1.00 | 1.00 | 0.40 | 0.40 | 3.00 | 3.00 |
| 2.00 | 2.00 | 0.30 | 0.30 | 2.00 | 2.00 |
| 4.00 | 4.00 | 0.20 | 0.20 | 1.00 | 1.00 |
| 6.00 | 6.00 | 0.10 | 0.10 | 0.50 | 0.50 |
| 8.00 | 8.00 | | | | |

LEAK CHECK

DATE 4-05-90

OPERATOR TJM

| | START CF | STOP CF | VOL | TIME | LEAK RATE |
|---|---|---|---|---|---|
| DRY | 117.000 | 117.235 | 0.235 | 10.000 | -0.001 |
| WET | 0.000 | 0.225 | 0.225 | | |

PYROMETER CALIBRATION

DATE 7-20-89

OPERATOR PS/D

| mV input | temp °F | temp rdg °F |
|---|---|---|
| 0.18 | 40 | 40 |
| 0.40 | 50 | 50 |
| 0.84 | 70 | 70 |
| 1.29 | 90 | 90 |
| 1.74 | 110 | 110 |
| 2.66 | 150 | 150 |
| 3.82 | 200 | 200 |
| 6.09 | 300 | 300 |
| 8.31 | 400 | 400 |
| 10.57 | 500 | 500 |

PYROMETER CHECK

DATE 4-05-90

OPERATOR TJM

| mV input | temp °F | temp rdg |
|---|---|---|
| 0.18 | 40 | 40 |
| 0.40 | 50 | 50 |
| 0.84 | 70 | 70 |
| 1.29 | 90 | 90 |
| 1.74 | 110 | 110 |
| 2.66 | 150 | 150 |
| 3.82 | 200 | 200 |
| 6.09 | 300 | 301 |
| 8.31 | 400 | 400 |
| 10.57 | 500 | 501 |

Name: Keystone Env Res Phone: 825-9261

Date 4-3-90 Train ID Box 1 DGM Cal. Factor, Y 1.03TD Orifice No. BAPC-3

Type of Meter Box Napp 100 Type of Pump Diaphraghm

| | | Example | Run Number 1 | 2 | 3 |
|---|---|---|---|---|---|
| **DGM** | | | | | |
| Final reading | $ft^3$ | 966.461 | 233.780 | 240.981 | 248.28 |
| Initial reading | $ft^3$ | 946.602 | 236.600 | 233.800 | 241.100 |
| Difference, $V_m$ | $ft^3$ | 9.859 | 7.170 | 7.181 | 7.186 |
| Percent Accuracy, ZA | | | | | |
| Inlet/Outlet temperatures | | | | | |
| Initial | °F. | 108/88 | 79 / 79 | 81 / 82 | 82 / 8 |
| After 5 minutes | | 110/88 | 80 / 79 | 82 / 82 | 82 / 8 |
| After 10 minutes | | 111/88 | 81 / 80 | 82 / 83 | 82 / 8 |
| Final | | 112/89 | 81 / 80 | 82 / 83 | 82 / 8 |
| Avg. temperature, $t_d$ | °F/°R | 99.3/559.3 | 79.9/539.1 | 82.1/542.1 | 82.5/54 |
| Time, θ | min | 15.0 | 15.0 | 15.0 | 15.0 |
| Orifice man. rdg., delta H | | 1.35 | .65 | .65 | .65 |
| Bar. pressure, $P_{bar}$ | | 29.75 | 28.75 | 28.75 | 28.95 |
| Ambient temperature, $t_i$ | °F/°C | 74/23.3 | 75 / 23.9 | 75 / 23.9 | 75 / 23 |
| Pump vacuum | in. Hg | 18.8 | 20.0 | 20.0 | 20.0 |
| $V_{m(std)}$' | $ft^3$ | 9.2815 | | | |
| DGM cal. factor, $Y_c$ | | 1.0593 | | | |
| *Vm(std)(M) | $m^3$ | 0.2629 | | | |

*If you calculate dry gas volume in English Units, use the conversion factor of 0.02832 $m^3/ft^3$ to obtain the volume in metric units.

Data Sheet

## VOLUMETRIC FLOW DEVICE CALCULATION SHEET  Box 1

Eq. 8-1 $$Vm(std) = VmY \left(\frac{Tstd}{Tm}\right) \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{Pstd}\right)$$

Run #1 $$Vm(std)' = Vm \times Y \times \frac{528}{Tm} \times \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{29.92}\right)$$

Vm(std)' = (7.170) (1.035) (.9779) (.9625)

Vm(std)' = 6.985 $ft^3$ (round to 3 decimals)

Run #2 Vm(std)' = (7.181) (1.035) (.9740) (.9625)

Vm(std)' = 6.968 $ft^3$

Run #3 Vm(std)' = (7.186) (1.035) (.9733) (.9625)

Vm(std)' = 6.967 $ft^3$

$$Vstd(M) = \frac{Vm(std)'\ Run\ \#1 + Vm(std)'\ Run\ \#2 + Vm(std)'\ Run\ \#3}{3}$$

Vstd(M) = 6.973 $ft^3$

---

(To Be Completed By Auditor)

$$\%\ A = \frac{Vstd(M) - Vstd(A)}{Vstd(A)} \times 100 \leq \pm 3\%$$

% A = _____ x 100

% A = _____ %

Name: Keystone Env. Resources  Phone: 825-9761

Date 4-6-90 Train ID Box 2 DGM Cal. Factor, Y 0.9624 Orifice No. BAPC 3

Type of Meter Box Napp 100 Type of Pump Diaphragm

| | | Example | Run Number 1 | 2 | 3 |
|---|---|---|---|---|---|
| **DGM** | | | | | |
| Final reading | $ft^3$ | 966.461 | 231.155 | 238.752 | 246.25 |
| Initial reading | $ft^3$ | 946.602 | 224.000 | 231.500 | 239.00 |
| Difference, $V_m$ | $ft^3$ | 9.859 | 7.155 | 7.252 | 7.25 |
| Percent Accuracy, %A | | | | | |
| Inlet/Outlet temperatures | | | | | |
| Initial | °F. | 108/88 | 78/77 | 78/77 | 79/7 |
| After 5 minutes | | 110/88 | 78/77 | 78/77 | 79/7 |
| After 10 minutes | | 111/88 | 78/77 | 79/77 | 79/7 |
| Final | | 112/89 | 78/77 | 79/78 | 79/ |
| Avg. temperature, $t_d$ | °F/°R | 99.3/559.3 | 77.5/537.5 | 77.8/537.8 | 78.5/53 |
| Time, θ | min | 15.0 | 15.0 | 15.0 | 15.0 |
| Orifice man. rdg., delta H | | 1.35 | .65 | .65 | .65 |
| Bar. pressure, $P_{bar}$ | | 29.75 | 28.85 | 28.85 | 28.85 |
| Ambient temperature, $t_i$ | °F/°C | 74/23.3 | 74/23.3 | 74/23.3 | 74/2 |
| Pump vacuum | in. Hg | 18.8 | 18.0 | 18.0 | 18.0 |
| $V_{m(std)}$' | $ft^3$ | 9.2815 | | | |
| DGM cal. factor, $Y_c$ | | 1.0593 | | | |
| *Vm(std)(M) | $m^3$ | 0.2629 | | | |

*If you calculate dry gas volume in English Units, use the conversion factor of 0.02832 $m^3/ft^3$ to obtain the volume in metric units.

Data Sheet

## VOLUMETRIC FLOW DEVICE CALCULATION SHEET Box 2

Eq. 8-1 $$Vm(std) = VmY \left(\frac{Tstd}{Tm}\right) \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{Pstd}\right)$$

Run #1 $$Vm(std)' = Vm \times Y \times \frac{528}{Tm} \times \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{29.92}\right)$$

Vm(std)' = (7.155)(.9624)(.9823)(.9658)

Vm(std)' = 6.533 $ft^3$ (round to 3 decimals)

Run #2 Vm(std)' = (7.252)(.9624)(.9818)(.9658)

Vm(std)' = 6.618 $ft^3$

Run #3 Vm(std)' = (7.255)(.9624)(.9805)(.9658)

Vm(std)' = 6.612 $ft^3$

$$Vstd(M) = \frac{Vm(std)'\ Run\ \#1 + Vm(std)'\ Run\ \#2 + Vm(std)'\ Run\ \#3}{3}$$

Vstd(M) = 6.588 $ft^3$

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

(To Be Completed By Auditor)

$$\%\ A = \frac{Vstd(M) - Vstd(A)}{Vstd(A)} \times 100 \leq \pm 3\%$$

% A = _____ x 100

% A = _____ %

Name: Keystone Env. Resource Phone: 825-2261

Date 5-6-90 Train ID Box 3 DGM Cal. Factor, Y .9998 Orifice No Box 3

Type of Meter Box Napp 100 Type of Pump Diaphragm

| | | Example | Run Number 1 | 2 | 3 |
|---|---|---|---|---|---|
| **DGM** | | | | | |
| Final reading | $ft^3$ | 966.461 | 662.287 | 670.056 | 678.20 |
| Initial reading | $ft^3$ | 946.602 | 654.900 | 662.700 | 670.906 |
| Difference, $V_m$ | $ft^3$ | 9.859 | 7.387 | 7.356 | 7.308 |
| Percent Accuracy, %A | | | | | |
| Inlet/Outlet temperatures | | | | | |
| Initial | °F. | 108/88 | 79/77 | 82/77 | 83/77 |
| After 5 minutes | | 110/88 | 80/77 | 83/78 | 84/77 |
| After 10 minutes | | 111/88 | 81/77 | 83/78 | 84/79 |
| Final | | 112/89 | 82/77 | 83/78 | 84/77 |
| Avg. temperature, $t_d$ | °F/°R | 99.3/559.3 | 78.7/538.7 | 80.2/540.2 | 81.3/541 |
| Time, θ | min | 15.0 | 15.0 | 15.0 | 15.0 |
| Orifice man. rdg., delta H | | 1.35 | .65 | .65 | .65 |
| Bar. pressure, $P_{bar}$ | | 29.75 | 28.85 | 28.85 | 28.85 |
| Ambient temperature, $t_i$ | °F/°C | 74/23.3 | 74/23.3 | 74/23.3 | 74/23 |
| Pump vacuum | in. Hg | 18.8 | 19.0 | 19.0 | 19.0 |
| $V_{m(std)}'$ | $ft^3$ | 9.2815 | | | |
| DGM cal. factor, $Y_c$ | | 1.0593 | | | |
| *Vm(std)(M) | $m^3$ | 0.2629 | | | |

*If you calculate dry gas volume in English Units, use the conversion factor of 0.02832 $m^3/ft^3$ to obtain the volume in metric units.

Data Sheet

## VOLUMETRIC FLOW DEVICE CALCULATION SHEET Box 3

Eq. 8-1 $$Vm(std) = VmY \left(\frac{Tstd}{Tm}\right) \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{Pstd}\right)$$

Run #1 $$Vm(std)' = Vm \times Y \times \frac{528}{Tm} \times \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{29.92}\right)$$

Vm(std)' = (7.387) (.9778) (.9801) (.9658)

Vm(std)' = 6.837 $ft^3$ (round to 3 decimals)

Run #2 Vm(std)' = (7.356) (.9778) (.9774) (.9658)

Vm(std)' = 6.790 $ft^3$

Run #3 Vm(std)' = (7.308) (.9778) (.9754) (.9658)

Vm(std)' = 6.732 $ft^3$

$$Vstd(M) = \frac{Vm(std)'\ Run\ \#1 + Vm(std)'\ Run\ \#2 + Vm(std)'\ Run\ \#3}{3}$$

Vstd(M) = 6.786 $ft^3$

---

(To Be Completed By Auditor)

$$\%\ A = \frac{Vstd(M) - Vstd(A)}{Vstd(A)} \times 100 \leq \pm 3\%$$

% A = _____ x 100

% A = _____ %

## VOLUMETRIC FLOW DEVICE CALCULATION SHEET Box 4

Eq. 8-1 $$Vm(std) = VmY \left(\frac{Tstd}{Tm}\right) \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{Pstd}\right)$$

Run #1 $$Vm(std)' = Vm \times Y \times \frac{528}{Tm} \times \left(\frac{Pbar + \frac{Delta\ H}{13.6}}{29.92}\right)$$

Vm(std)' = (7.280)(.9558)(.9830)(.9658)

Vm(std)' = 6.606 $ft^3$ (round to 3 decimals)

Run #2 Vm(std)' = (7.335)(.9558)(.9735)(.9658)

Vm(std)' = 6.592 $ft^3$

Run #3 Vm(std)' = (7.385)(.9558)(.9685)(.9658)

Vm(std)' = 6.602 $ft^3$

$$Vstd(M) = \frac{Vm(std)'\ Run\ \#1 + Vm(std)'\ Run\ \#2 + Vm(std)'\ Run\ \#3}{3}$$

Vstd(M) = 6.600 $ft^3$

---

(To Be Completed By Auditor)

$$\%\ A = \frac{Vstd(M) - Vstd(A)}{Vstd(A)} \times 100 \leq \pm 3\%$$

% A = _____ x 100

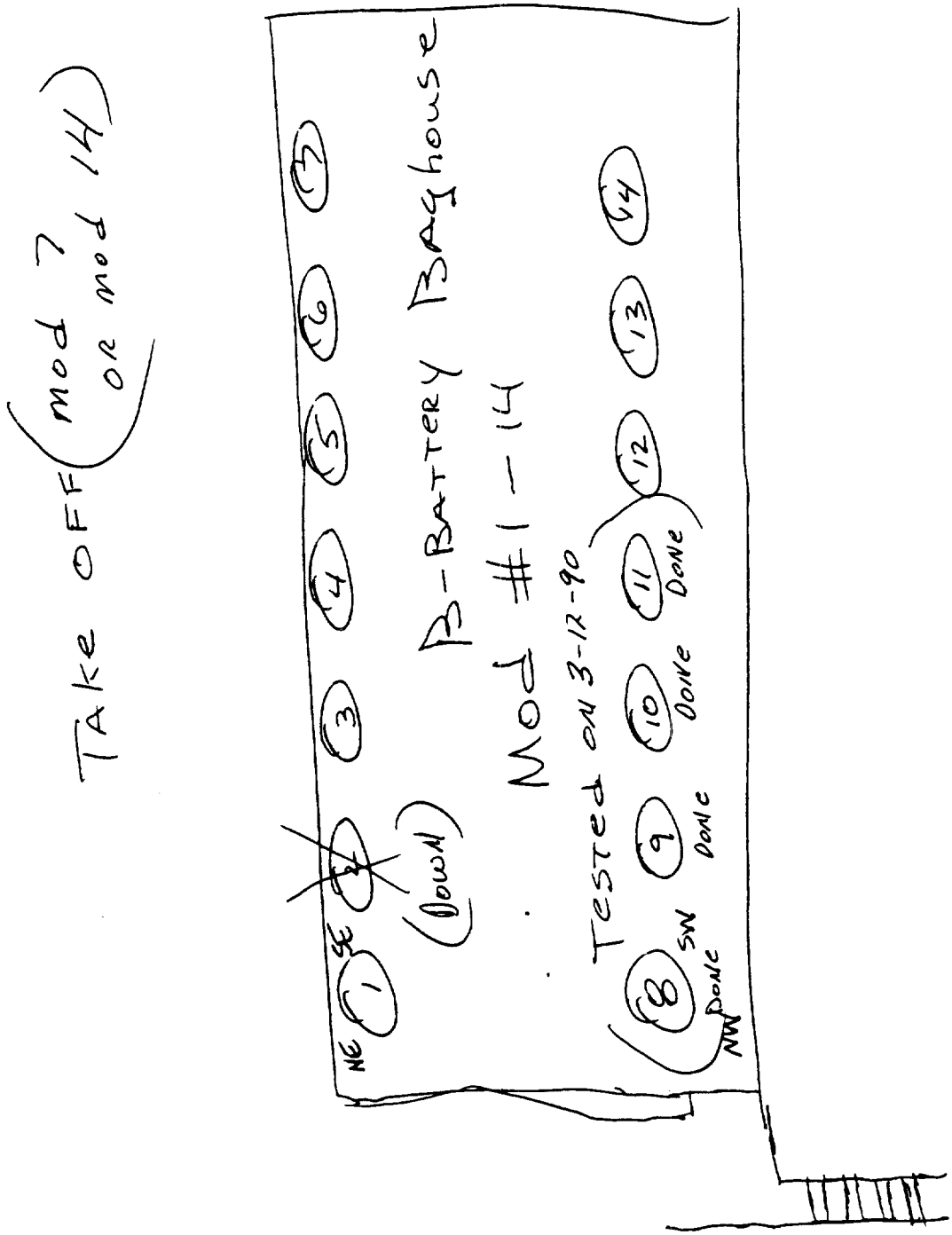
% A = _____ %

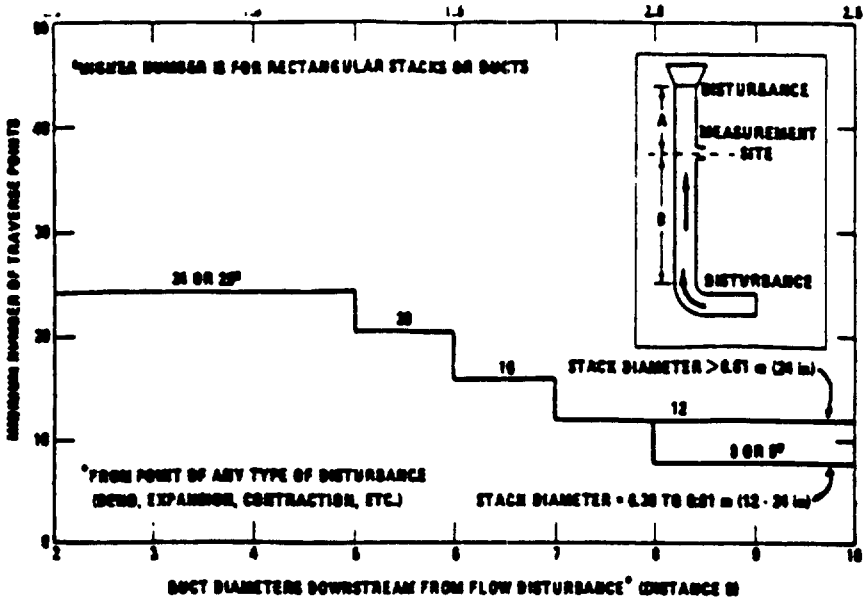
# APPENDIX D

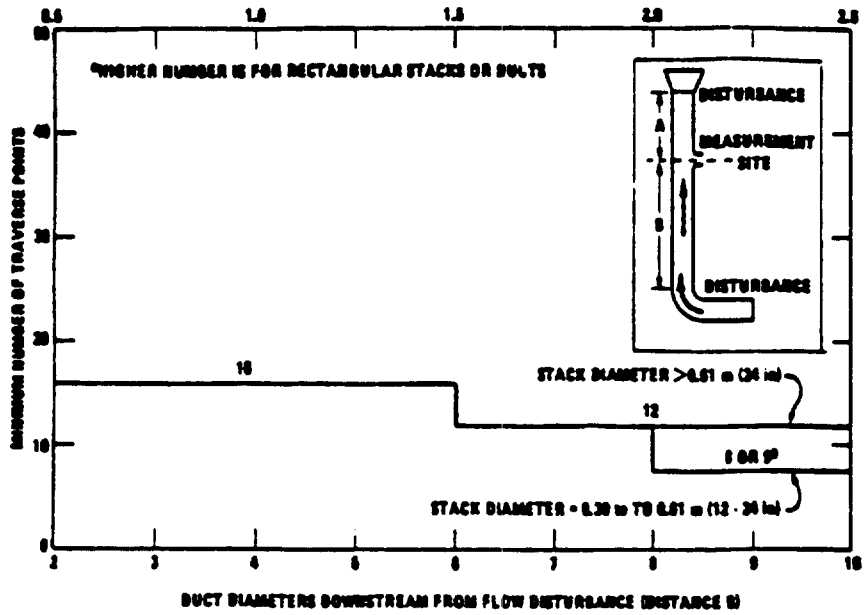
# FIELD DATA SHEETS FOR PARTICULATE MATTER EMISSIONS

US x Chairton
B-Battery Baghouse

3-12-90 & 3-13-90






## TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

(Percent of stack diameter from inside wall to traverse point)

| Traverse point number on a diameter | Number of traverse points on a diameter— | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| 1 | 14.6 | 6.7 | 4.4 | 3.2 | 2.6 | 2.1 | 1.8 | 1.6 | 1.4 | 1.3 | 1.1 | 1.1 |
| 2 | 85.4 | 25.0 | 14.6 | 10.5 | 8.2 | 6.7 | 5.7 | 4.9 | 4.4 | 3.9 | 3.5 | 3.2 |
| 3 | | 75.0 | 29.6 | 19.4 | 14.6 | 11.8 | 9.9 | 8.5 | 7.5 | 6.7 | 6.0 | 5.5 |
| 4 | | 93.3 | 70.4 | 32.3 | 22.6 | 17.7 | 14.6 | 12.5 | 10.9 | 9.7 | 8.7 | 7.9 |
| 5 | | | 85.4 | 67.7 | 34.2 | 25.0 | 20.1 | 16.9 | 14.6 | 12.9 | 11.6 | 10.5 |
| 6 | | | 95.6 | 80.6 | 65.8 | 35.6 | 26.9 | 22.0 | 18.8 | 16.5 | 14.6 | 13.2 |
| 7 | | | | 89.5 | 77.4 | 64.4 | 36.6 | 28.3 | 23.6 | 20.4 | 18.0 | 16.1 |
| 8 | | | | 96.8 | 85.4 | 75.0 | 63.4 | 37.5 | 29.6 | 25.0 | 21.8 | 19.4 |
| 9 | | | | | 91.8 | 82.3 | 73.1 | 62.5 | 38.2 | 30.6 | 26.2 | 23.0 |
| 10 | | | | | 97.4 | 88.2 | 79.9 | 71.7 | 61.8 | 36.8 | 31.5 | 27.2 |
| 11 | | | | | | 93.3 | 85.4 | 78.0 | 70.4 | 61.2 | 38.3 | 32.3 |
| 12 | | | | | | 97.9 | 90.1 | 83.1 | 76.4 | 69.4 | 60.7 | 38.8 |
| 13 | | | | | | | 94.3 | 87.5 | 81.2 | 75.0 | 68.5 | 60.2 |
| 14 | | | | | | | 98.2 | 91.5 | 85.4 | 79.6 | 73.8 | 67.7 |
| 15 | | | | | | | | 95.1 | 89.1 | 83.5 | 78.2 | 72.8 |
| 16 | | | | | | | | 98.4 | 92.5 | 87.1 | 82.0 | 77.0 |
| 17 | | | | | | | | | 95.6 | 90.3 | 85.4 | 80.6 |
| 18 | | | | | | | | | 98.6 | 93.3 | 88.4 | 83.9 |
| 19 | | | | | | | | | | 96.1 | 91.3 | 86.8 |
| 20 | | | | | | | | | | 98.7 | 94.0 | 89.5 |
| 21 | | | | | | | | | | | 96.5 | 92.1 |
| 22 | | | | | | | | | | | 98.9 | 94.5 |
| 23 | | | | | | | | | | | | 96.8 |
| 24 | | | | | | | | | | | | 98.9 |

### TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

| Number of traverse points | Matrix layout |
|---|---|
| 9 | 3 × 3 |
| 12 | 3 × 4 |
| 16 | 4 × 4 |
| 20 | 4 × 5 |
| 25 | 5 × 5 |
| 30 | 5 × 6 |
| 36 | 6 × 6 |
| 42 | 6 × 7 |
| 49 | 7 × 7 |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod #8

# STACK SAMPLING DATA SHEET

PLANT USX CLAIRTON DATE: 3-12-90 ΔH@: 1.781 (12-27-89) HOT BOX NO.: 5
LOCATION: B-Battery Baghouse TEST NO.: CLR-M8-1 METER CORRECTION: 1.0372 COLD BOX NO.: 5
ACTIVITY NO.: MOD. 8 NOZZLE: #44 0.209 PITOT CORRECTION: .84 PROBE NO.: 5-3
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: .40 CONTROL BOX NO.: 1 FILTER NO.: 351
PROBE HANDLER: PORT DIRECTION: (SW), NW NOMOGRAPH SET POINT: STACK DIA.: 48
CLEAN UP: BAROMETRIC PRESSURE: 29.37 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 11:25 | 854.664 | .35 | .56 | .56 | 87 | 84 | 2.9 | 130 | 260° | ≤68° | 245° | 5min/PT |
| 44.8 | 11:30 | | .40 | .74 | .74 | 91 | 86 | 3.2 | 124 | | | | |
| 42.3 | 11:35 | 859.868 | .45 | .80 | .80 | 91 | 87 | 3.5 | 121 | | | | |
| 39.5 | 11:40 | 859.868 | .50 | .92 | .92 | 92 | 87 | 3.6 | 124 | | 54° | | |
| 36.0 | 11:45 | | .45 | .80 | .80 | 94 | 88 | 3.2 | 124 | | | | |
| 30.9 | 11:50 | | .45 | .80 | .80 | 98 | 91 | 3.2 | 124 | | | | |
| 17.1 | 11:55 | | .40 | .74 | .74 | 101 | 93 | 3.1 | 124 | | 55° | | |
| 12.0 | 12:00 | | .35 | .56 | .56 | 102 | 99 | 2.8 | 119 | | | | |
| 8.5 | 12:47 | 874.258 | .35 | .56 | .56 | 103 | 97 | 2.8 | 126 | | | | |
| 5.7 | 12:10 | 874.258 | .35 | .56 | .56 | 105 | 99 | 2.8 | 125 | | | | |
| 3.2 | [illegible] | [illegible] | .35 | [illegible] | [illegible] | 101 | 99 | 2.2 | 123 | | 55° | | |
| 1.0 | [illegible] | | .20 | .38 | .38 | 104 | 100 | 2.0 | 123 | | | | |

882.179

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| Before | | |
| After | | |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | | | |
| 2 100ml | | | |
| 3 Dry | | | |
| 4 Silica | | | |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod # 8

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-12-90
ΔH@: 1.281 (12-27-89)
HOT BOX NO.: 5
LOCATION: B-Battery Baghouse
TEST NO.: CLR-MS-1
METER CORRECTION: 1.0372
COLD BOX NO.: 5
ACTIVITY NO.: MOD. #8
NOZZLE: #4 0.209
PITOT CORRECTION: .84
PROBE NO.: 5-3
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .40
CONTROL BOX NO.: 1
FILTER NO.: 351
PROBE HANDLER:
PORT DIRECTION: NW
NOMOGRAPH SET POINT:
STACK DIA.: 48
CLEAN UP:
BAROMETRIC PRESSURE: 29.37
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 14:45 | 882.179 | .10 | .20 | .20 | 98 | 96 | 2.1 | 126 | 260° | 68°F | 245° | Start/pt |
| 44.8 | | | .10 | .20 | .20 | 102 | 98 | 2.1 | 122 | | | | |
| 42.3 | | | .15 | .28 | .28 | 103 | 99 | 2.0 | 132 | | 53° | | |
| 39.5 | | | .15 | .28 | .28 | 103 | 98 | 1.9 | 131 | | | | |
| 36.0 | | | .25 | .44 | .44 | 104 | 99 | 2.3 | 125 | | | | |
| 30.9 | | | .30 | .56 | .56 | 104 | 100 | 2.9 | 128 | | | | |
| 27.1 | | | .50 | .92 | .92 | 106 | 100 | 3.8 | 124 | | 54° | | |
| 12.0 | | | .90 | 1.66 | 1.66 | 107 | 100 | 6.0 | 123 | | | | |
| 8.5 | | | .90 | 1.66 | 1.66 | 108 | 100 | 6.0 | 127 | | | | |
| 5.7 | | | .25 | .44 | .44 | 107 | 100 | 2.3 | 125 | | 54° | | |
| 3.2 | | | .90 | 1.66 | 1.66 | 109 | 101 | 6.0 | 125 | | | | |
| 1.0 | | | .50 | .92 | .92 | 108 | 101 | 4.0 | 121 | | | | |
| | 15:45 | 914.213 | | | | | | | | | | | |

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| Before | 5.0 | .006 CFM / 1.02 CFM |
| After | 7.0 | 1.02 CFM |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 | 586.8 | 581.6 | 5.2 |
| 2 | 562.5 | 558.6 | 3.9 |
| 3 | 412.8 | 411.8 | 1.0 |
| 4 | 664.9 | 655.0 | 9.9 |

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ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

Mod # 9

PLANT USX CLAIRTON DATE: 3-12-90 ΔH@: 1.519 (12-27-87) HOT BOX NO.: 1

LOCATION: B-BATTERY BAGHOUSE TEST NO.: CLR-M9-15W METER CORRECTION: 0.9624 COLD BOX NO.: 1

ACTIVITY NO.: MOD. 9 NOZZLE: #39 (.232) PITOT CORRECTION: .84 PROBE NO.: 5-5

CONTROL BOX OPERTOR: STATIC PRESSURE Ps: .40 CONTROL BOX NO.: 2 FILTER NO.: 355

PROBE HANDLER: PORT DIRECTION: SW NOMOGRAPH SET POINT: STACK DIA.: 48.0

CLEAN UP: BAROMETRIC PRESSURE: 29.37 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 11:25 | 781.116 | .30 | 0.72 | 0.72 | 88 | 83 | 2.0 | 124 | 260 | 68°F | 250 | 5 min/pt |
| 44.8 | 11:30 | | .30 | 0.72 | 0.72 | 91 | 84 | 2.0 | 121 | | | | |
| 42.3 | 11:35 | | .30 | 0.72 | 0.72 | 94 | 85 | 2.0 | 121 | | | | |
| 39.5 | 11:40 | | .20 | 0.49 | 0.49 | 95 | 89 | 2.0 | 119 | | | | |
| 36.0 | 12:52 ~~11:45~~ | | .20 | 0.49 | 0.49 | 98 | 91 | 2.0 | 125 | | | | |
| 30.9 | 12:57 ~~11:50~~ | | .23 | 0.56 | 0.56 | 99 | 91 | 2.0 | 122 | | | | |
| 17.1 | 13:02 ~~11:55~~ | | .25 | 0.62 | 0.62 | 101 | 91 | 2.0 | 119 | | | | |
| 12.0 | 13:07 ~~12:00~~ | | .35 | 0.86 | 0.86 | 102 | 92 | 2.0 | 121 | | | | |
| 8.5 | 13:12 ~~12:05~~ | | .40 | 0.99 | 0.99 | 101 | 96 | 3.0 | 126 | | | | |
| 5.7 | ~~12:10~~ | | .43 | 1.06 | 1.06 | 103 | 96 | 3.5 | 128 | | | | |
| 3.2 | ~~12:15~~ | TIME 14:04 | .40 | 0.99 | 0.99 | 104 | 96 | 3.0 | 123 | | | | |
| 1.0 | ~~12:20~~ | 14:09 | .25 | 0.62 | 0.62 | 104 | 96 | 2.0 | 122 | | | | |
| | ~~12:25~~ | 14:14 | | | | | | | | | | | |

Final Meter Reading 814.770

**LEAK CHECK**

| | in. Hg. | Rate |
|---|---|---|
| Before | 5.0 | L.02 CFM |
| After | 7.0 | .008 CFM L.02 CFM |

**ORSAT**

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

**PITOT LEAK CHECK**

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | | | |
| 2 100ml | | | |
| 3 DRY | | | |
| 4 Silicl | | | |
| 5 | | | |

D-5

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod # 9

# STACK SAMPLING DATA SHEET

PLANT: USX-Clairton
DATE: 3-12-90
ΔH@: 1.519 (12-27-89)
HOT BOX NO.: 1
LOCATION: B-Battery Baghouse
TEST NO.: CLR-M9-1 NW
METER CORRECTION: .9624
COLD BOX NO.: 1
ACTIVITY NO.: MOD. 9
NOZZLE: #39 .232
PITOT CORRECTION: .84
PROBE NO.: 5-5
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .40
CONTROL BOX NO.: 2
FILTER NO.: 355
PROBE HANDLER:
PORT DIRECTION: NW
NOMOGRAPH SET POINT:
STACK DIA.: 48.0"
CLEAN UP:
BAROMETRIC PRESSURE: 29.37
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 14:45 | 814.770 | .60 | 1.48 | 1.48 | 101 | 95 | 4.0 | 122 | 260 | Iced Down <68°F | 250 | 5 min/pt |
| 44.8 | 14:50 | | .80 | 1.98 | 1.98 | 102 | 95 | 6.0 | 121 | | | | |
| 42.3 | 14:55 | | .80 | 1.98 | 1.98 | 105 | 95 | 6.0 | 131 | | | | |
| 39.5 | 15:00 | | .70 | 1.74 | 1.74 | 106 | 95 | 6.0 | 128 | | | | |
| 36.0 | 15:05 | | .60 | 1.47 | 1.47 | 106 | 95 | 5.0 | 123 | | | | |
| 30.9 | 15:10 | | .40 | 0.98 | 0.98 | 106 | 96 | 3.0 | 126 | | | | |
| 17.1 | 15:15 | | .15 | 0.37 | 0.37 | 106 | 96 | 2.0 | 122 | | | | |
| 12.0 | 15:20 | | .15 | 0.37 | 0.37 | 104 | 96 | 2.0 | 121 | | | | |
| 8.5 | 15:25 | | .20 | 0.49 | 0.49 | 104 | 96 | 2.0 | 124 | | | | |
| 5.7 | 15:30 | | .20 | 0.49 | 0.49 | 104 | 96 | 2.0 | 123 | | | | |
| 3.2 | 15:35 | | .20 | 0.49 | 0.49 | 103 | 95 | 2.0 | 119 | | | | |
| 1.0 | 15:40 | | .21 | 0.52 | 0.52 | 103 | 95 | 2.0 | 121 | | | | |
| | 15:45 | 853.711 | | | | | | | | | | | |

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| Before | | |
| After | | |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | | |
| $O_2$ | | |
| CO | | |
| N | | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 | 555.1 | 549.3 | 5.8 |
| 2 | 560.7 | 558.0 | 2.7 |
| 3 | 455.0 | 453.9 | 1.1 |
| 4 | 683.2 | 668.2 | 15.0 |

Mod #10

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton DATE: 3-12-90 ΔH@: 1.634 (12-28-89) HOT BOX NO.: 4
LOCATION: B-Battery/Baghouse TEST NO.: CLR-M10-1 METER CORRECTION: 0.9778 COLD BOX NO.: 4
ACTIVITY NO.: MOD. 10 NOZZLE: 37 .237 PITOT CORRECTION: .84 PROBE NO.: 5-2 (SS)
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: .40 CONTROL BOX NO.: 3 FILTER NO.: 353
PROBE HANDLER: PORT DIRECTION: ~~[illegible]~~, SW NOMOGRAPH SET POINT: STACK DIA.: 48.0
CLEAN UP: BAROMETRIC PRESSURE: 29.37 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1125 | 299.019 | .55 | 1.58 | 1.58 | 90 | 82 | 6.5 | 123 | 255 | 55 | 250 | 5m/PT |
| 44.8 | 1134.0 | 305.843 | .32 | .90 | .90 | 92 | 83 | 5.0 | 122 | | | | |
| 42.3 | 1240 | 305.843 | .60 | 1.68 | 1.68 | 100 | 88 | 7.0 | 126 | | 58 | | 12:40 New Start Time |
| 39.5 | | | .20 | .56 | .56 | 104 | 91 | 3.0 | 118 | | | | |
| 36.0 | | | .40 | 1.12 | 1.12 | 107 | 91 | 5.0 | 122 | | 58 | | |
| 30.9 | | | .37 | 1.04 | 1.04 | 110 | 92 | 4.5 | 120 | | | | |
| 17.1 | | | .20 | 0.56 | 0.56 | 111 | 94 | 3.0 | 122 | | 58 | | |
| 12.0 | | | .20 | .56 | .56 | 111 | 95 | 3.0 | 124 | | | | |
| 8.5 | | | .20 | .56 | .56 | 104 | 95 | 3.0 | 129 | | 57 | | |
| 5.7 | | | .20 | .56 | .56 | 107 | 94 | 3.0 | 123 | | | | |
| 3.2 | | | .16 | .46 | .46 | 108 | 95 | 2.5 | 119 | | 57 | | |
| 1.0 | ~~1334~~ | 331.467 | .16 | .46 | .46 | 109 | 95 | 2.5 | 115 | | | | |

D-7

**LEAK CHECK**

| | in. Hg. | Rate |
|---|---|---|
| Before | 7.0 | <.02 CFM |
| After | 7.0 | .013 CFM 1.02 |

**ORSAT**

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

**PITOT LEAK CHECK**

| POS. | NEG. |
|---|---|
| OK 15 sec | OK 15 sec |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | 535.4 | 528.9 | 6.5 |
| 2 100ml | 547.0 | 543.5 | 3.5 |
| 3 Dry | 446.9 | 445.6 | 1.3 |
| 4 Silgel | 642.4 | 630.8 | 11.6 |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod #10

# STACK SAMPLING DATA SHEET

PLANT USX CLAIRTON DATE: 3-12-90 ΔH@: 1.634 (12-28-89) HOT BOX NO.: 4
LOCATION: B-Battery Baghouse TEST NO.: CLR-M10-1 METER CORRECTION: 0.9778 COLD BOX NO.: 4
ACTIVITY NO.: MOD. 10 NOZZLE: #37 0.237 PITOT CORRECTION: 0.84 PROBE NO.: 5-2
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: 0.40 CONTROL BOX NO.: 3 FILTER NO.: 353
PROBE HANDLER: PORT DIRECTION: NW NOMOGRAPH SET POINT: STACK DIA.: 48.0"
CLEAN UP: BAROMETRIC PRESSURE: 29.37 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1445 | 331.467 | .27 | .78 | .78 | 104 | 96 | 4.0 | 118 | 260 | 60 | 255 | 5 min/pt |
| 44.8 | | | .36 | 1.04 | 1.04 | 110 | 96 | 5.0 | 126 | | | | |
| 42.3 | | | .36 | 1.04 | 1.04 | 116 | 96 | 5.0 | 127 | | 55 | | |
| 39.5 | | | .31 | .89 | .89 | 117 | 97 | 4.0 | 123 | | | | |
| 36.0 | | | .27 | .78 | .78 | 117 | 98 | 4.0 | 123 | | 56 | | |
| 30.9 | | | .26 | .75 | .75 | 118 | 99 | 4.0 | 123 | | | | |
| 17.1 | | | .34 | .98 | .98 | 120 | 99 | 4.5 ~~4.5~~ | 123 | | | | |
| 12.0 | | | .40 | 1.15 | 1.15 | 122 | 100 | 5.5 5.0 | 123 | | 54 | | |
| 8.5 | | | .43 | 1.24 | 1.24 | 121 | 101 | 5.5 | 121 | | | | |
| 5.7 | | | .38 | 1.10 | 1.10 | 120 | 101 | 5.0 | 125 | | 54 | | |
| 3.2 | | | .30 | .87 | .87 | 119 | 101 | 4.0 | 121 | | | | |
| 1.0 | 1545 | 367.104 | .42 | 1.21 | 1.21 | 121 | 101 | 5.5 | 118 | | 56 | | |

D-8

**LEAK CHECK**

| | in. Hg. | Rate |
|---|---|---|
| Before | | |
| After | 11" | |

**ORSAT**

| | 1 | 2 |
|---|---|---|
| $CO_2$ | | |
| $O_2$ | | |
| CO | | |
| N | | |

**PITOT LEAK CHECK**

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod #11

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-12-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 6
LOCATION: B-Battery/Baghouse
TEST NO.: CLR-M11-1
METER CORRECTION: 0.9558
COLD BOX NO.: 6
ACTIVITY NO.: MOD. 11
NOZZLE: 45 .201
PITOT CORRECTION: .84
PROBE NO.: 5-4
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .12
CONTROL BOX NO.: 4
FILTER NO.: 346
PROBE HANDLER:
PORT DIRECTION: SW
NOMOGRAPH SET POINT:
STACK DIA.: 48.0
CLEAN UP:
BAROMETRIC PRESSURE: 29.37
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1125 | 655.561 | .40 | .63 | .63 | 91 | 89 | 5.0 | 130 | 260 | Ice Down < 68°F | 250 | 5m/PT |
| 44.8 | 1135 | 660.607 | .45 | .71 | .71 | 91 | 88 | 5.5 | 131 | | | | |
| 42.3 | 1240 | 660.607 | .60 | .95 | .95 | 92 | 91 | 6.5 | 136 | | | | |
| 39.5 | 1245 | | .50 | .79 | .79 | 93 | 92 | 6.0 | 131 | | | | |
| 36.0 | 1250 | | .45 | .71 | .71 | 94 | 93 | 5.5 | 136 | | 58°F | | |
| 30.9 | 1255 | | .45 | .71 | .71 | 96 | 94 | 5.5 | 136 | | | | |
| 17.1 | 1300 | | .45 | .71 | .71 | 98 | 96 | 5.5 | 133 | | | | |
| 12.0 | 1305 | 675.644 | .50 | .79 | .79 | 99 | 96 | 6.0 | 133 | | 59°F | | |
| 8.5 | 1350 | 675.644 | .50 | .79 | .79 | 101 | 102 | 6.0 | 133 | | | | |
| 5.7 | 1355 | | .45 | .71 | .71 | 102 | 102 | 5.5 | 132 | | | | |
| 3.2 | 1400 | | .40 | .63 | .63 | 102 | 102 | 5.0 | 132 | | 58°F | | |
| 1.0 | 1405 | | .30 | .47 | .47 | 103 | 103 | 4.5 | 130 | | | | |
| | 1410 | 685.913 | | | | | | | | | | | |

D-9

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| Before | 5.0 | <.02 CFM |
| After | 8.0 | <.02 CFM |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | | |
| $O_2$ | | |
| CO | | |
| N | | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| OK 15 sec | OK 15 sec |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100 | | | |
| 2 100 | | | |
| 3 Dry | | | |
| 4 Silica | | | |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

Mod #11

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-12-90
ΔH@: 1.762 (12-20-89)
HOT BOX NO.: 6
LOCATION: B-Battery Baghouse
TEST NO.: CLR-M11-1
METER CORRECTION: .9558
COLD BOX NO.: 6
ACTIVITY NO.: MOD. 11
NOZZLE: #45 .201
PITOT CORRECTION: .84
PROBE NO.: 5-4
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .2
CONTROL BOX NO.: 4
FILTER NO.: 346
PROBE HANDLER:
PORT DIRECTION: ~~SE~~ NW
NOMOGRAPH SET POINT:
STACK DIA.: 48.0
CLEAN UP:
BAROMETRIC PRESSURE:
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp. °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1445 | 685.914 | .40 | .63 | .63 | 100 | 102 | 5.0 | 132 | 260 | Ice down <68°F | 250 | |
| 44.8 | 1450 | | .20 | .32 | .32 | 100 | 101 | 4.0 | 127 | | | | |
| 42.3 | 1455 | | .25 | .39 | .39 | 100 | 101 | 4.0 | 134 | | | | |
| 39.5 | 1500 | | .25 | .39 | .39 | 100 | 101 | 4.0 | 137 | | 58° | | |
| 36.0 | 1505 | | .30 | .47 | .47 | 103 | 102 | 4.5 | 133 | | | | |
| 30.9 | 1510 | | .30 | .47 | .47 | 103 | 102 | 4.5 | 133 | | | | |
| 17.1 | 1515 | | .60 | .95 | .95 | 105 | 104 | 6.0 | 128 | | 57° | | |
| 12.0 | 1520 | | .80 | 1.26 | 1.26 | 106 | 106 | 8.0 | 127 | | | | |
| 8.5 | 1525 | | .80 | 1.26 | 1.26 | 106 | 107 | 8.0 | 135 | | | | |
| 5.7 | 1530 | | .80 | 1.26 | 1.26 | 107 | 108 | 8.0 | 134 | | 59° | | |
| 3.2 | 1535 | | .80 | 1.26 | 1.26 | 107 | 108 | 8.0 | 138 | | | | |
| 1.0 | 1540 | 715.645 | .60 | .95 | .95 | 108 | 108 | 6.0 | 135 | | | | |
| | 1545 | | | | | | | | | | | | |

D-10

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| Before | | |
| After | | |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | | |
| $O_2$ | | |
| CO | | |
| N | | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 | 563.9 | 559.7 | 4.2 |
| 2 | 545.1 | 543.1 | 2.0 |
| 3 | 440.5 | 440.0 | .50 |
| 4 | 683.6 | 670.2 | 13.4 |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 2
LOCATION: B-Battery Baghouse
TEST NO.: CLR-M1-1
METER CORRECTION: 0.9558
COLD BOX NO.: 2
ACTIVITY NO.: MOD. 1
NOZZLE: #44 0.209
PITOT CORRECTION: 0.84
PROBE NO.: 5-3
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 0.40
CONTROL BOX NO.: 4
FILTER NO.: 354
PROBE HANDLER:
PORT DIRECTION: NE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 955 | 715.650 | .40 | .72 | .72 | 79 | 78 | 4.5 | 130 | 260 | Feed Down <68°F | 250 | 5min/PT |
| 44.8 | | | .50 | .90 | .90 | 80 | 79 | 5.0 | 125 | | | | |
| 42.3 | | | .60 | 1.08 | 1.08 | 82 | 80 | 6.0 | 122 | | 58° | | |
| 39.5 | | | .60 | 1.08 | 1.08 | 83 | 81 | 6.0 | 131 | | | | |
| 36.0 | | | .50 | .90 | .90 | 85 | 83 | 5.0 | 134 | | | | |
| 30.9 | | | .50 | .90 | .90 | 87 | 86 | 5.0 | 136 | | 57° | | |
| 17.1 | | | .50 | .90 | .90 | 89 | 87 | 5.0 | 136 | | | | |
| 12.0 | | | .60 | 1.08 | 1.08 | 90 | 89 | 6.0 | 134 | | | | |
| 8.5 | | | .40 | .72 | .72 | 93 | 91 | 4.5 | 137 | | 59° | | |
| 5.7 | | | .60 | 1.09 | 1.09 | 94 | 93 | 6.0 | 136 | | | | |
| 3.2 | | | .60 | 1.09 | 1.09 | 95 | 94 | 6.0 | 136 | | | | |
| 1.0 | 1055 | 748.490 | .40 | .72 | .72 | 96 | 95 | 6.0 | 136 | | 59° | | |

D-11

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| efore | 5.0 | <0.02 cfm |
| ter | 8.0 | .010 cfm |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| OK 15sec | OK 15sec |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | 550.7 | 541.8 | 9.9 |
| 2 100ml | 581.6 | 577.2 | 4.4 |
| 3 DRY | 373.5 | 372.0 | 1.5 |
| 4 200gm SILICA | 601.9 | 590.3 | 11.6 |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 2
LOCATION: B-Battery Baghouse
TEST NO.: CLR-M1-1
METER CORRECTION: 0.9558
COLD BOX NO.: 2
ACTIVITY NO.: MOD. 1
NOZZLE: #44 0.209
PITOT CORRECTION: 0.84
PROBE NO.: 5-3
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 0.40
CONTROL BOX NO.: 4
FILTER NO.: 354
PROBE HANDLER:
PORT DIRECTION: SE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1125 | 748.490 | .40 | .72 | .72 | 93 | 94 | 4.5 | 140 | 260 | Iced down <68°F | 250 | 5min/PT |
| 44.8 | | | .40 | .72 | .72 | 94 | 95 | 4.5 | 140 | | | | |
| 42.3 | | | .40 | .72 | .72 | 95 | 95 | 4.5 | 138 | | 59° | | |
| 39.5 | | | .40 | .72 | .72 | 95 | 95 | 4.5 | 138 | | | | |
| 36.0 | | | .40 | .72 | .72 | 96 | 96 | 4.5 | 140 | | | | |
| 30.9 | | | .40 | .72 | .72 | 97 | 97 | 4.5 | 140 | | 59° | | |
| 17.1 | | | .60 | 1.08 | 1.08 | 98 | 97 | 6.0 | 140 | | | | |
| 12.0 | | | .60 | 1.08 | 1.08 | 98 | 98 | 6.0 | 142 | | | | |
| 8.5 | | | .80 | 1.45 | 1.45 | 100 | 99 | 7.5 | 142 | | 59° | | |
| 5.7 | | | .80 | 1.45 | 1.45 | 100 | 100 | 7.5 | 138 | | | | |
| 3.2 | | | .80 | 1.45 | 1.45 | 101 | 100 | 7.5 | 138 | | | | |
| 1.0 | 1225 | 753.470 | .80 | 1.45 | 1.45 | 101 | 100 | 7.5 | 138 | | 59° | | |

D-12

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| :fore | | |
| ter | | |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | | | |
| 2 100ml | | | |
| 3 DRY | | | |
| 4 200gm <1ml | | | |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton | DATE: 3-13-90 | ΔH@: 1.579 (12-27-89) | HOT BOX NO.: 7
LOCATION: B-Battery Exhaust | TEST NO.: CLR-M3-1 | METER CORRECTION: 0.9624 | COLD BOX NO.: 7
ACTIVITY NO.: MOD. 3 | NOZZLE: #39 0.232 | PITOT CORRECTION: 0.84 | PROBE NO.: 5-5
CONTROL BOX OPERTOR: | STATIC PRESSURE Ps: 0.30 | CONTROL BOX NO.: 2 | FILTER NO.: 352
PROBE HANDLER: | PORT DIRECTION: NE | NOMOGRAPH SET POINT: | STACK DIA.: 48"
CLEAN UP: | BAROMETRIC PRESSURE: 29.55 | LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 0955 | 855.392 | 0.6 | 1.46 | 1.46 | 84 | 79 | 10.0 | 122 | 260 | Ice Down 68°F | 250 | 5min/PT |
| 44.8 | | | 0.6 | 1.46 | 1.46 | 89 | 81 | 10.0 | 117 | | | | |
| 42.3 | | | 0.7 | 1.70 | 1.70 | 91 | 82 | 13.0 | 115 | | | | |
| 39.5 | | | 0.6 | 1.46 | 1.46 | 92 | 84 | 11.0 | 125 | | 63°F | | |
| 36.0 | | | 0.6 | 1.46 | 1.46 | 93 | 85 | 11.0 | 120 | | | | |
| 30.9 | | | 0.5 | 1.22 | 1.22 | 95 | 86 | 8.2 | 126 | | | | |
| 17.1 | | | 0.5 | 1.22 | 1.22 | 96 | 87 | 8.8 | 123 | | | | |
| 12.0 | | | 0.6 | 1.46 | 1.46 | 97 | 87 | 10.4 | 119 | | | | |
| 8.5 | | | 0.7 | 1.70 | 1.70 | 98 | 88 | 12.3 | 129 | | 59°F | | |
| 5.7 | | | 0.7 | 1.70 | 1.70 | 97 | 89 | 12.3 | 124 | | | | |
| 3.2 | | | 0.7 | 1.70 | 1.70 | 97 | 89 | 12.3 | 123 | | | | |
| 1.0 | | | 0.6 | 1.46 | 1.46 | 98 | 90 | 10.8 | 121 | | | | |
| | 1055 | 901.468 | | | | | | | | | | | |

D-13

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| efore | 5.0 | 0.007 cfm |
| ilter | 17.0 | 0.019 cfm |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| 15 sec OK | 15 sec OK |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | 552.3 | 545.3 | 7.0 |
| 2 100ml | 547.9 | 539.8 | 8.1 |
| 3 DRY | 456.6 | 453.9 | 2.7 |
| 4 200gm 5.16ml | 670.4 | 654.6 | 15.8 |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
LOCATION: B-Battery/Baghouse
ACTIVITY NO.: MOD. 3
CONTROL BOX OPERTOR:
PROBE HANDLER:
CLEAN UP:

DATE: 3-13-90
TEST NO.: CLR-M3 - 1
NOZZLE: #39 0.232
STATIC PRESSURE Ps: 0.30
PORT DIRECTION: SE
BAROMETRIC PRESSURE: 29.55

ΔH@: 1.519 (12-27-89)
METER CORRECTION: 0.9624
PITOT CORRECTION: 0.84
CONTROL BOX NO.: 2
NOMOGRAPH SET POINT:
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

HOT BOX NO.: 7
COLD BOX NO.: 7
PROBE NO.: 5-5
FILTER NO.: 352
STACK DIA.: 48"

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1125 | 901.468 | 0.4 | 0.97 | 0.97 | 94 | 91 | 7.0 | 133 | 260 | Iced Down <68°F | 250 | 5min/pt |
| 44.8 | | | 0.4 | 0.97 | 0.97 | 98 | 92 | 7.0 | 126 | | | | |
| 42.3 | | | 0.4 | 0.97 | 0.97 | 100 | 92 | 7.0 | 139 | | | | |
| 39.5 | | | 0.2 | 0.49 | 0.49 | 100 | 92 | 4.0 | 127 | | | | |
| 36.0 | | | 0.3 | 0.73 | 0.73 | 101 | 92 | 5.3 | 133 | | 65°F | | |
| 30.9 | | | 0.4 | 0.97 | 0.97 | 101 | 93 | 7.0 | 138 | | | | |
| 17.1 | | | 0.6 | 1.46 | 1.46 | 102 | 93 | 10.3 | 126 | | | | |
| 12.0 | | | 0.8 | 1.95 | 1.95 | 101 | 93 | 14.0 | 134 | | | | |
| 8.5 | | | 1.0 | 2.44 | 2.44 | 104 | 93 | 15.0 | 130 | | | | |
| 5.7 | | | 1.2 | 2.92 | 2.92 | 106 | 94 | 16.0 | 127 | | | | |
| 3.2 | | | 0.9 | 2.19 | 2.19 | 106 | 95 | 14.5 | 132 | | 63°F | | |
| 1.0 | | | 0.7 | 1.70 | 1.70 | 105 | 94 | 12.0 | 129 | | | | |
| | 1225 | 946.832 | | | | | | | | | | | |

D-14

**LEAK CHECK**

| | in. Hg. | Rate |
|---|---|---|
| fore | | |
| er | | |

**ORSAT**

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | | |

**PITOT LEAK CHECK**

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100 ml | | | |
| 2 100 ml | | | |
| 3 DRY | | | |
| 4 Silica | | | |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton | DATE: 3-13-90 | ΔH@: 1.519 (12-27-89) | HOT BOX NO.: 6
LOCATION: B-Battery/Baghouse | TEST NO. CLR-M4-1 | METER CORRECTION: 0.9624 | COLD BOX NO.: 6
ACTIVITY NO.: MOD. 4 | NOZZLE: #39 0.232 | PITOT CORRECTION: 0.84 | PROBE NO.: 5-5
CONTROL BOX OPERTOR: | STATIC PRESSURE Ps: 0.3 | CONTROL BOX NO.: 2 | FILTER NO.: 377
PROBE HANDLER: | PORT DIRECTION: NE | NOMOGRAPH SET POINT: | STACK DIA.: 48"
CLEAN UP: | BAROMETRIC PRESSURE: 29.55 | LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1425 | 947.127 | 0.3 | 0.71 | 0.71 | 96 | 93 | 4.1 | 148 | 260 | Dud Down <68°F | 250 | 5 min/pt |
| 44.8 | | | 0.3 | 0.71 | 0.71 | 101 | 94 | 4.1 | 146 | | | | |
| 42.3 | | | 0.3 | 0.71 | 0.71 | 102 | 95 | 4.1 | 149 | | | | |
| 39.5 | | | 0.4 | 0.95 | 0.95 | 102 | 94 | 5.3 | 156 | | 65°F | | |
| 36.0 | | | 0.4 | 0.95 | 0.95 | 103 | 95 | 5.3 | 147 | | | | |
| 30.9 | | | 0.5 | 1.19 | 1.19 | 104 | 96 | 7.0 | 151 | | 62°F | | |
| 17.1 | | | 0.6 | 1.43 | 1.43 | 104 | 96 | 8.2 | 147 | | | | |
| 12.0 | | | 0.8 | 1.90 | 1.90 | 103 | 96 | 11.9 | 146 | | 58°F | | |
| 8.5 | | | 0.9 | 2.14 | 2.14 | 101 | 95 | 14.7 | 158 | | | | |
| 5.7 | | | 1.0 | 2.34 | 2.34 | 99 | 94 | 15.6 | 151 | | 57°F | | |
| 3.2 | | | 1.0 | 2.34 | 2.34 | 97 | 93 | 15.6 | 148 | | | | |
| 1.0 | | | 0.2 | 0.47 | 0.47 | 97 | 92 | 3.0 | 143 | | | | |
| | 1525 | 990.405 | | | | | | | | | | | |

D-15

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| Before | 5.0 | <0.02 cfm |
| After | [illegible] | 0.00 |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | [illegible] | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| 15 sec OK | 15 sec OK |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | 556.5 | 554.4 | 2.1 |
| 2 100ml | 554.8 | 544.6 | 0.2 |
| 3 Dry | 464.0 | 462.0 | 2.0 |
| 4 Silica | 698.7 | 683.9 | 14.8 |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
LOCATION: B-Battery Baghouse
ACTIVITY NO.: MOD. 4
CONTROL BOX OPERTOR:
PROBE HANDLER:
CLEAN UP:

DATE: 3-13-90
TEST NO.: CLR-M4-1
NOZZLE: #39 0.232
STATIC PRESSURE Ps: 0.3
PORT DIRECTION: SE
BAROMETRIC PRESSURE: 29.55

ΔH@: 1.519 (12-27-89)
METER CORRECTION: 0.9624
PITOT CORRECTION: 0.84
CONTROL BOX NO.: 2
NOMOGRAPH SET POINT:
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

HOT BOX NO.: #6
COLD BOX NO.: #6
PROBE NO.: 5-5
FILTER NO.: 377
STACK DIA.: 48"

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1545 | 990.405 | 0.8 | 1.87 | 187 | 99 | 95 | 11.3 | 147 | 260 | Ice/Dry <68°F | 250 | 5 min/pt |
| 44.8 | | | 0.8 | 1.87 | 1.87 | 102 | 96 | 11.3 | 144 | | | | |
| 42.3 | | | 0.7 | 1.64 | 1.64 | 103 | 96 | 10.0 | 142 | | 61°F | | |
| 39.5 | | | 0.7 | 1.64 | 1.64 | 105 | 96 | 10.0 | 140 | | | | |
| 36.0 | | | 0.5 | 1.17 | 1.17 | 106 | 97 | 7.0 | 140 | | 63°F | | |
| 30.9 | | | 0.5 | 1.17 | 1.17 | 107 | 98 | 7.0 | 138 | | | | |
| 17.1 | | | 0.6 | 1.40 | 1.40 | 108 | 99 | 7.8 | 150 | | 60°F | | |
| 12.0 | | | 0.8 | 1.87 | 1.87 | 107 | 98 | 11.2 | 145 | | | | |
| 8.5 | | | 0.2 | 0.47 | 0.47 | 106 | 99 | 2.9 | 152 | | 61°F | | |
| 5.7 | | | 1.0 | 2.34 | 2.34 | 108 | 99 | 15.3 | 146 | | | | |
| 3.2 | | | 1.0 | 2.34 | 2.34 | 105 | 99 | 15.3 | 150 | | 58°F | | |
| 1.0 | | | 0.5 | 1.17 | 1.17 | 104 | 99 | 7.0 | 133 | | | | |
| | 1645 | 038.179 | | | | | | | | | | | |

D-16

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| efore | | |
| fter | | |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | [illegible] | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | | | |
| 2 100ml | | | |
| 3 Dry | | | |
| 4 Silica | | | |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT USX Clairton DATE: 3-13-90 ΔH@: 1.762 (12-28-89) HOT BOX NO.: 5
LOCATION: B-Battery Baghouse TEST NO.: CLP-M5-1 METER CORRECTION: 0.9558 COLD BOX NO.: 5
ACTIVITY NO.: MOD 5 NOZZLE: #44 0.209 PITOT CORRECTION: 0.84 PROBE NO.: 5-3
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: 0.3 CONTROL BOX NO.: 4 FILTER NO.: 347
PROBE HANDLER: PORT DIRECTION: NE CONTROL BOX NO.: NOMOGRAPH SET POINT: STACK DIA.: 48"
CLEAN UP: BAROMETRIC PRESSURE: 29.55 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1425 | 783.600 | .30 | .54 | .54 | 95 | 96 | 5.0 | 146 | 260 | Iced Down <68°F | 250 | 5 min/pt |
| 44.8 | | | .30 | .54 | .54 | 97 | 96 | 5.0 | 149 | | | | |
| 42.3 | | | .30 | .54 | .54 | 98 | 97 | 5.0 | 148 | | 59° | | |
| 39.5 | | | .30 | .54 | .54 | 98 | 97 | 5.0 | 142 | | | | |
| 36.0 | | | .35 | .64 | .64 | 101 | 99 | 5.0 | 139 | | | | |
| 30.9 | | | .40 | .73 | .73 | 102 | 101 | 5.0 | 149 | | 58° | | |
| 17.1 | | | .50 | .91 | .91 | 104 | 103 | 6.0 | 147 | | | | |
| 12.0 | | | .50 | .91 | .91 | 104 | 104 | 6.0 | 145 | | | | |
| 8.5 | | | .50 | .91 | .91 | 104 | 104 | 6.0 | 150 | | 59° | | |
| 5.7 | | | .40 | .73 | .73 | 104 | 104 | 6.0 | 149 | | | | |
| 3.2 | | | .40 | .73 | .73 | 104 | 104 | 6.0 | 144 | | | | |
| 1.0 | 1525 | 812.564 | .40 | .73 | .73 | 104 | 104 | 6.0 | 144 | | 59° | | |

D-17

**LEAK CHECK**

| | in. Hg. | Rate |
|---|---|---|
| Before | 5.0 | <0.02 cfm |
| After | | |

**ORSAT**

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |

**PITOT LEAK CHECK**

| POS. | NEG. |
|---|---|
| 15 sec OK | 15 sec OK |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | | | |
| 2 100ml | | | |
| 3 0ml | | | |
| 4 ½ml | | | |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.762 (12-28-89)
HOT BOX NO.: 5
LOCATION: B Battery/Baghouse
TEST NO.: CLR-M5-1
METER CORRECTION: 0.9558
COLD BOX NO.: 5
ACTIVITY NO.: MOD 5
NOZZLE: #44 0.209
PITOT CORRECTION: 0.84
PROBE NO.: 5-3
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: 0.3
CONTROL BOX NO.: 4
FILTER NO.: 347
PROBE HANDLER:
PORT DIRECTION: SE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 1545 | 812.564 | .30 | .54 | .54 | 105 | 107 | 5.0 | 145 | 260 | Ice Down <68°F | 250 | 5 min/pt |
| 44.8 | | | .30 | .54 | .54 | 105 | 107 | 5.0 | 146 | | | | |
| 42.3 | | | .40 | .73 | .73 | 107 | 107 | 5.0 | 143 | | 59° | | |
| 39.5 | | | .40 | .73 | .73 | 107 | 107 | 5.0 | 145 | | | | |
| 36.0 | | | .40 | .73 | .73 | 107 | 107 | 5.0 | 146 | | | | |
| 30.9 | | | .40 | .73 | .73 | 107 | 108 | 5.0 | 141 | | 58° | | |
| 17.1 | | | .40 | .73 | .73 | 107 | 108 | 5.0 | 140 | | | | |
| 12.0 | | | .40 | .73 | .73 | 108 | 108 | 5.0 | 144 | | | | |
| 8.5 | | | .40 | .73 | .73 | 108 | 108 | 5.0 | 148 | | 59° | | |
| 5.7 | | | .40 | .73 | .73 | 108 | 108 | 5.0 | 146 | | | | |
| 3.2 | | | .40 | .73 | .73 | 108 | 108 | 5.0 | 145 | | | | |
| 1.0 | 1645 | 842.990 | .30 | .54 | .54 | 108 | 109 | 5.0 | 148 | | 58° | | |

D-18

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| Before | | |
| After | | |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial 513.7 | Difference |
|---|---|---|---|
| 1 100ml | 518.7 | ~~516~~ | 5.0 |
| 2 100ml | 559.7 | 556.4 | 3.3 |
| 3 DRY | 483.6 | 481.9 | 1.7 |
| 4 Silica | [illegible] | 148.9 | 15.7 |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT USX Clairton DATE: 3-13-90 ΔH@: 1.634 (12-28-89) HOT BOX NO.: 1
LOCATION: B-Battery Baghouse TEST NO.: CL-M6-1 METER CORRECTION: 0.9778 COLD BOX NO.: 1
ACTIVITY NO.: MOD. 6 NOZZLE: #45 0.201 PITOT CORRECTION: 0.84 PROBE NO.: 5-4
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: 0.3 CONTROL BOX NO.: 3 FILTER NO.: 338
PROBE HANDLER: PORT DIRECTION: NE NOMOGRAPH SET POINT: STACK DIA.: 48"
CLEAN UP: BAROMETRIC PRESSURE: 29.55 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 14:25 | 426.372 | 0.25 | 0.35 | 0.35 | 98 | 91 | 2.0 | 150 | 260 | Tied Down <68°F | 250 | 5 min/pt |
| 44.8 | 14:30 | | 0.25 | 0.35 | 0.35 | 103 | 93 | 2.0 | 150 | | | | |
| 42.3 | 14:35 | | 0.27 | 0.38 | 0.38 | 106 | 94 | 2.0 | 147 | | | | |
| 39.5 | 14:40 | | 0.27 | 0.38 | 0.38 | 107 | 94 | 2.0 | 145 | | | | |
| 36.0 | 14:45 | | 0.27 | 0.38 | 0.38 | 109 | 94 | 2.0 | 147 | | | | |
| 30.9 | 14:50 | | 0.30 | 0.43 | 0.43 | 109 | 95 | 2.5 | 150 | | | | |
| 17.1 | 14:55 | | 0.50 | 0.72 | 0.72 | 110 | 95 | 3.0 | 147 | | | | |
| 12.0 | 15:00 | | 0.60 | 0.86 | 0.86 | 110 | 94 | 3.5 | 146 | | | | |
| 8.5 | 15:05 | | 0.60 | 0.86 | 0.86 | 110 | 94 | 3.5 | 152 | | | | |
| 5.7 | 15:10 | | 0.70 | 1.00 | 1.00 | 110 | 93 | 4.0 | 147 | | | | |
| 3.2 | 15:15 | | 0.60 | 0.86 | 0.86 | 110 | 93 | 3.5 | 143 | | | | |
| 1.0 | 15:20 | | 0.40 | 0.57 | 0.57 | 110 | 93 | 2.5 | 139 | | | | |
| | 15:25 | 456.480 | | | | | | | | | | | |

D-19

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| efore | 5.0 | <0.02 cfm |
| | 1.0 | 0.005 |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| 15 sec OK | 15 sec OK |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | 561.0 | 554.2 | 6.8 |
| 2 100ml | 562.0 | 560.4 | 1.6 |
| 3 0ml | 453.0 | 451.1 | 1.9 |
| 4 silica | 690.0 | 675.8 | 14.2 |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT USX Clairton DATE: 3-13-90 ΔH@: 1.634 (12-28-89) HOT BOX NO.: 1
LOCATION: B-Battery Daghase TEST NO.: CLF-M6-1 METER CORRECTION: 0.9778 COLD BOX NO.: 1
ACTIVITY NO.: MOD. 6 NOZZLE: #45 0.201 PITOT CORRECTION: 0.84 PROBE NO.: 5-4
CONTROL BOX OPERTOR: STATIC PRESSURE Ps: 0.3 CONTROL BOX NO.: 3 FILTER NO.: 338
PROBE HANDLER: PORT DIRECTION: SE NOMOGRAPH SET POINT: STACK DIA.: 48"
CLEAN UP: BAROMETRIC PRESSURE: 29.55 LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 15:44 | 456.480 | .40 | 0.57 | 0.57 | 101 | 92 | 2.0 | 145 | 260 | Feed Down <68°F | 250 | 5 min/pt |
| 44.8 | 15:49 | | .40 | 0.57 | 0.57 | 107 | 93 | 2.5 | 143 | | | | |
| 42.3 | 15:54 | | .50 | 0.71 | 0.71 | 109 | 95 | 3.0 | 141 | | | | |
| 39.5 | 15:59 | | .50 | 0.71 | 0.71 | 111 | 95 | 3.0 | 140 | | | | |
| 36.0 | 16:04 | | .50 | 0.72 | 0.72 | 112 | 96 | 3.0 | 138 | | | | |
| 30.9 | 16:09 | | .50 | 0.72 | 0.72 | 113 | 96 | 3.0 | 136 | | | | |
| 17.1 | 16:14 | | .40 | 0.58 | 0.58 | 113 | 97 | 2.5 | 146 | | | | |
| 12.0 | 16:19 | | .50 | 0.72 | 0.72 | 114 | 97 | 3.0 | 143 | | | | |
| 8.5 | 16:24 | | .50 | 0.72 | 0.72 | 114 | 97 | 3.0 | 148 | | | | |
| 5.7 | 16:29 | | .60 | 0.87 | 0.87 | 115 | 98 | 3.5 | 142 | | | | |
| 3.2 | 16:34 | | .50 | 0.72 | 0.72 | 115 | 98 | 3.0 | 141 | | | | |
| 1.0 | 16:39 | | .40 | 0.58 | 0.58 | 115 | 99 | 2.5 | 140 | | | | |
| | 16:44 | 486.838 | | | | | | | | | | | |

D-20

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| efore | | |
| fter | | |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | | | |
| 2 100ml | | | |
| 3 0ml | | | |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT USX Clairton | DATE: 3-13-90 | ΔH@: 1.781 (12-27-89) | HOT BOX NO.: 1
LOCATION: B-Battery/Baghouse | TEST NO.: CLR-M7-1 | METER CORRECTION: 1.0372 | COLD BOX NO.: 1
ACTIVITY NO.: MOD. 7 | NOZZLE: [illegible] 0.237 | PITOT CORRECTION: 0.84 | PROBE NO.: 5-2 5-2
CONTROL BOX OPERTOR: | STATIC PRESSURE Ps: .40 | CONTROL BOX NO.: 1 | FILTER NO.: 371 371
PROBE HANDLER: | PORT DIRECTION: NE | NOMOGRAPH SET POINT: | STACK DIA.: 48"
CLEAN UP: | BAROMETRIC PRESSURE: 29.55 | LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | [illegible] | [illegible] | [illegible] | .63 | .63 | 98 | 97 | 3.0 | 138 | 260 | Iced Down <68°F | 250 | 5 min/pt |
| 44.8 | [illegible] | | [illegible] | 1.39 | 1.39 | 104 | [illegible] | 5.5 | 140 | | | | |
| 42.3 | [illegible] | | [illegible] | 2.02 | 2.02 | 107 | 100 | 8.1 | 137 | | 60° | | |
| 39.5 | [illegible] | | [illegible] | 1.89 | 1.89 | 109 | 100 | 7.5 | 131 | | | | |
| 36.0 | [illegible]:45 | | .80 | 2.02 | 2.02 | 111 | 103 | 8.0 | 134 | | | | |
| 30.9 | [illegible]:50 | | .60 | 1.51 | 1.51 | 111 | 104 | 6.6 | 135 | | | | |
| 17.1 | [illegible]:55 | | .45 | 1.14 | 1.14 | 111 | 105 | 5.0 | 135 | | 59° | | |
| 12.0 | 15:00 | | .45 | 1.14 | 1.14 | 110 | 105 | 5.0 | 135 | | | | |
| 8.5 | 15:05 | | .35 | .88 | .88 | 108 | 105 | 4.0 | 134 | | | | |
| 5.7 | 15:10 | | .30 | .76 | .76 | 108 | 105 | 3.5 | 130 | | | | |
| 3.2 | 15:15 | | .30 | .76 | .76 | 108 | 105 | 3.5 | 130 | | 60° | | |
| 1.0 | 15:20 | | .25 | .63 | .63 | 110 | 104 | 3.2 | 120 | | | | |
| | 15:25 | 034.071 | | | | | | | | | | | |

D-21

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| fore | 5.0 | <0.02 cfm |
| [illegible] | [illegible] | 0.01 |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | [illegible] | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| OK 15 sec | OK 15 sec |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100 ml | 544.8 | 538.7 | 6.1 |
| 2 100 ml | 552.8 | 544.1 | 8.7 |
| 3 DRY | 432.3 | 431.1 | 1.2 |
| 4 Silica | 656.0 | 642.3 | 13.7 |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.781 (12-27-89)
HOT BOX NO.: 4
LOCATION: B-Battery/Baghouse
TEST NO.: CLR-M7 - 1
METER CORRECTION: 1.0372
COLD BOX NO.: 4
ACTIVITY NO.: MOD. 7
NOZZLE: #37 0.237
PITOT CORRECTION: 0.84
PROBE NO.: 5-2
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .40
CONTROL BOX NO.: 1
FILTER NO.: 371
PROBE HANDLER:
PORT DIRECTION: SE
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 15:45 | 034.071 | .25 | .63 | .63 | 104 | 104 | 3.0 | 135 | 260 | Tied Down <68°F | 250 | 5min/pt |
| 44.8 | 15:50 | | .25 | .63 | .63 | 109 | 105 | 3.0 | 132 | | | | |
| 42.3 | 15:55 | | .25 | .63 | .63 | 110 | 105 | 3.0 | 131 | | 59° | | |
| 39.5 | 16:00 | | .25 | .63 | .63 | 109 | 104 | 3.0 | 130 | | | | |
| 36.0 | 16:05 | | .30 | .76 | .76 | 110 | 104 | 3.2 | 127 | | | | |
| 30.9 | 16:10 | | .30 | .76 | .76 | 110 | 104 | 3.2 | 125 | | | | |
| 17.1 | 16:15 | | .80 | 2.02 | 2.02 | 112 | 105 | 7.5 | 132 | | 60° | | |
| 12.0 | 16:20 | | .95 | 2.40 | 2.40 | 113 | 105 | 9.0 | 130 | | | | |
| 8.5 | 16:25 | | 1.00 | 2.52 | 2.52 | 113 | 104 | 9.5 | 136 | | | | |
| 5.7 | 16:30 | | 1.00 | 2.52 | 2.52 | 113 | 104 | 9.6 | 134 | | | | |
| 3.2 | 16:35 | | 1.00 | 2.52 | 2.52 | 113 | 104 | 9.8 | 119 | | 58° | | |
| 1.0 | 16:40 | | .95 | 2.40 | 2.40 | 113 | 104 | 8.9 | 90 | | | | |
| | 16:45 | 076.200 | | | | | | | | | | | |

D-22

**LEAK CHECK**

| | in. Hg. | Rate |
|---|---|---|
| fore | | |
| er | | |

**ORSAT**

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | | |

**PITOT LEAK CHECK**

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100 ml | | | |
| 2 100 ml | | | |
| 3 DRY | | | |
| 4 Silica | | | |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.781 (12-27-89)
HOT BOX NO.: 1
LOCATION: B-Battery Exhaust
TEST NO.: CLR-M12-1
METER CORRECTION: 1.0372
COLD BOX NO.: 1
ACTIVITY NO.: Mod #12
NOZZLE: #37 0.237
PITOT CORRECTION: 0.84
PROBE NO.: 5-2
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .30
CONTROL BOX NO.: 1
FILTER NO.: 361
PROBE HANDLER:
PORT DIRECTION: SW
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 9.55 | 914.921 | .25 | .74 | .74 | 78 | 75 | 5.0 | 119 | 260 | Cool Down <68°F | 250 | 5min/PT |
| 44.8 | 10:00 | | .25 | .74 | .74 | 84 | 78 | 6.0 | 119 | | | | |
| 42.3 | 10:05 | | .30 | .89 | .89 | 87 | 80 | 6.1 | 117 | | | | |
| 39.5 | 10:10 | | .30 | .89 | .89 | 90 | 82 | 6.5 | 124 | | 59° | | |
| 36.0 | 10:15 | | .30 | .89 | .89 | 92 | 84 | 6.5 | 123 | | | | |
| 30.9 | 10:20 | | .30 | .89 | .89 | 93 | 85 | 6.5 | 124 | | | | |
| 17.1 | 10:25 | | .45 | 1.35 | 1.35 | 95 | 87 | 9.4 | 120 | | 57° | | |
| 12.0 | 10:30 | | .60 | 1.79 | 1.79 | 97 | 87 | [redacted] 120 | 118 | | | | |
| 8.5 | 10:35 | | .65 | 1.94 | 1.94 | 97 | 87 | 14.0 | 126 | | | | |
| 5.7 | 10:40 | | .60 | 1.79 | 1.79 | 96 | 89 | 13.8 | 124 | | 56° | | |
| 3.2 | 10:45 | | .60 | 1.79 | 1.79 | 97 | 90 | 13.6 | 119 | | | | |
| 1.0 | 10:50 | | .40 | 1.19 | 1.19 | 97 | 90 | 9.0 | 110 | | | | |
| | 10:55 | 953.249 | | | | | | | | | | | |

D-23

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| efore | 5.0 | <0.02 cfm |
| fter | 16.0 | .01 CFM |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| ok 15sec | ok 15sec |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | 562.4 | 553.2 | 9.2 |
| 2 100ml | 567.5 | 559.7 | 7.8 |
| 3 DRY | 452.9 | 450.0 | 2.9 |
| 4 200gms 5.16ml | 702.1 | 685.5 | 16.6 |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT: USX Clairton
DATE: 3-13-90
ΔH@: 1.781 (12-27-89)
HOT BOX NO.: 1
LOCATION: B-Battery Baghouse
TEST NO.: CLR-M12-1
METER CORRECTION: 1.0372
COLD BOX NO.: 1
ACTIVITY NO.: MOD #12
NOZZLE: #37 0.237
PITOT CORRECTION: 0.84
PROBE NO.: 5-2
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .30
CONTROL BOX NO.: 1
FILTER NO.: 361
PROBE HANDLER:
PORT DIRECTION: NW
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 11:27 | 953.249 | .25 | .74 | .74 | 91 | 88 | 6.0 | 127 | 260 | Tred down 468°F | 250 | 5 min/pt |
| 44.8 | 11:32 | | .25 | .74 | .74 | 95 | 90 | 6.0 | 124 | | | | |
| 42.3 | 11:37 | | .25 | .74 | .74 | 97 | 91 | 6.1 | 133 | | 57° | | |
| 39.5 | 11:42 | | .25 | .74 | .74 | 98 | 91 | 6.0 | 127 | | | | |
| 36.0 | 11:47 | | .25 | .74 | .74 | 99 | 92 | 6.0 | 129 | | | | |
| 30.9 | 11:52 | | .25 | .74 | .74 | 100 | 93 | 6.0 | 131 | | | | |
| 17.1 | 11:57 | | .45 | 1.34 | 1.34 | 102 | 94 | 9.0 | 125 | | 55° | | |
| 12.0 | 12:02 | | .50 | 1.49 | 1.49 | 102 | 95 | 10.0 | 131 | | | | |
| 8.5 | 12:07 | | .55 | 1.64 | 1.64 | 103 | 96 | 11.0 | 128 | | | | |
| 5.7 | 12:12 | | .70 | 2.09 | 2.09 | 103 | 96 | 14.5 | 100 | | | | |
| 3.2 | 12:17 | | .80 | 2.38 | 2.38 | 106 | 99 | 5.5 | 121 | | 56° | | |
| 1.0 | 12:22 | | .50 | 1.49 | 1.49 | 105 | 95 | 4.0 | 93 | | | | |
| | 12:27 | 953.800 | | | | | | | | | | | |

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| fore | | |
| er | | |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100 ml | | | |
| 2 100 ml | | | |
| 3 DRY | | | |
| 4 Silica | | | |

**KEYSTONE**
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT USX Clairton
DATE: 3-13-90
ΔH@: 1.634 (12-28-89)
HOT BOX NO.: 5
LOCATION: B-Battery/Baghouse
TEST NO.: CLF-M14-1
METER CORRECTION: 0.9778
COLD BOX NO.: 5
ACTIVITY NO.: MOD. 14
NOZZLE: #45 0.201
PITOT CORRECTION: 0.84
PROBE NO.: 5-4
CONTROL BOX OPERTOR:
STATIC PRESSURE Ps: .40
CONTROL BOX NO.: 3
FILTER NO.: 378
PROBE HANDLER:
PORT DIRECTION: SW
NOMOGRAPH SET POINT:
STACK DIA.: 48"
CLEAN UP:
BAROMETRIC PRESSURE: 29.55
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 09:55 | 367.470 | 0.25 | 0.36 | 0.36 | 77 | 72 | 2.0 | 120 | 260 | Ice Drum <68°F | 250 | 5 min/pt |
| 44.8 | 10:00 | | 0.25 | 0.36 | 0.36 | 83 | 73 | 2.0 | 119 | | | | |
| 42.3 | 10:05 | | 0.25 | 0.36 | 0.36 | 88 | 76 | 2.0 | 119 | | | | |
| 39.5 | 10:10 | | 0.28 | 0.40 | 0.40 | 91 | 77 | 2.0 | 123 | | | | |
| 36.0 | 10:15 | | 0.30 | 0.43 | 0.43 | 94 | 80 | 2.0 | 121 | | | | |
| 30.9 | 10:20 | | 0.35 | 0.50 | 0.50 | 96 | 80 | 3.0 | 122 | | | | |
| 17.1 | 10:25 | | 0.60 | 0.86 | 0.86 | 99 | 81 | 4.0 | 123 | | | | |
| 12.0 | 10:30 | | 0.60 | 0.88 | 0.88 | 102 | 82 | 4.0 | 121 | | | | |
| 8.5 | 10:35 | | 0.70 | 1.03 | 1.03 | 102 | 84 | 4.0 | 121 | | | | |
| 5.7 | 10:40 | | 0.70 | 1.03 | 1.03 | 102 | 84 | 4.0 | 122 | | | | |
| 3.2 | 10:45 | | 0.60 | 0.88 | 0.88 | 102 | 84 | 3.5 | 123 | | | | |
| 1.0 | 10:50 | | 0.50 | 0.73 | 0.73 | 102 | 85 | 3.0 | 122 | | | | |
| | 10:55 | 398.662 | | | | | | | | | | | |

D-25

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| efore | 5.0 | <0.02 cfm |
| fter | 6.0 | 0.005 CFM |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| red OK 15sec | OK 15sec |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | 520.5 | 510.6 | 9.9 |
| 2 100ml | 564.6 | 559.0 | 5.6 |
| 3 DRY | 485.0 | 483.4 | 1.6 |
| 4 silica | 675.9 | 664.9 | 11.0 |

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

# STACK SAMPLING DATA SHEET

PLANT USX Clairton
LOCATION: B-Battery/Baghouse
ACTIVITY NO.: MOD. 14
CONTROL BOX OPERTOR:
PROBE HANDLER:
CLEAN UP:

DATE: 3-13-90
TEST NO. CLR-M14-1
NOZZLE: #45 0.201
STATIC PRESSURE Ps: 0.40
PORT DIRECTION: NW
BAROMETRIC PRESSURE: 29.55

ΔH@: 1.634 (12-28-89)
METER CORRECTION: 0.9778
PITOT CORRECTION: 0.84
CONTROL BOX NO.: 3
NOMOGRAPH SET POINT:
LENGTHS OF UMBILICAL ____ x 25' ____ x 50'

HOT BOX NO.: 5
COLD BOX NO.: 5
PROBE NO.: 5-4
FILTER NO.: 378
STACK DIA.: 48"

| Point | Time | Meter Reading (dry) CF | Velocity HD in. $H_2O$ | Orifice ΔH in. $H_2O$ Reg. | Orifice ΔH in. $H_2O$ Act. | Meter Temp °F In | Meter Temp °F Out | Vacuum in. Hg | Stack Temp °F | Probe Temp °F | Imp. Temp. °C/°F | Hot Box °F | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.0 | 11:27 | 398.662 | .30 | 0.43 | 0.43 | 82 | 83 | 2.0 | 121 | 260 | Tied Down <68°F | 250 | 5min/pt |
| 44.8 | 11:32 | | .25 | 0.36 | 0.36 | 96 | 83 | 2.0 | 124 | | | | |
| 42.3 | 11:37 | | .38 | 0.55 | 0.55 | 98 | 84 | 2.0 | 131 | | | | |
| 39.5 | 11:42 | | .35 | 0.51 | 0.51 | 100 | 85 | 2.0 | 127 | | | | |
| 36.0 | 11:47 | | .42 | 0.61 | 0.61 | 102 | 86 | 2.5 | 129 | | | | |
| 30.9 | 11:52 | | .42 | 0.61 | 0.61 | 103 | 87 | 2.5 | 131 | | | | |
| 17.1 | 11:57 | | .40 | 0.58 | 0.58 | 104 | 88 | 2.5 | 125 | | | | |
| 12.0 | 12:02 | | .40 | 0.58 | 0.58 | 104 | 89 | 2.5 | 127 | | | | |
| 8.5 | 12:07 | | .40 | 0.58 | 0.58 | 104 | 89 | 2.5 | 127 | | | | |
| 5.7 | 12:12 | | .43 | 0.63 | 0.63 | 104 | 89 | 2.5 | 126 | | | | |
| 3.2 | 12:17 | | .25 | 0.37 | 0.37 | 105 | 90 | 2.0 | 124 | | | | |
| 1.0 | 12:22 | | .25 | 0.37 | 0.37 | 105 | 90 | 2.0 | 121 | | | | |
| | 12:27 | 426.220 | | | | | | | | | | | |

D-26

## LEAK CHECK

| | in. Hg. | Rate |
|---|---|---|
| efore | | |
| fter | | |

## ORSAT

| | 1 | 2 |
|---|---|---|
| $CO_2$ | 0.0 | |
| $O_2$ | 20.5 | |
| CO | 0.0 | |
| N | 79.5 | |

## PITOT LEAK CHECK

| POS. | NEG. |
|---|---|
| | |

| Impinger No. | Final | Initial | Difference |
|---|---|---|---|
| 1 100ml | | | |
| 2 100ml | | | |
| 3 DRY | | | |
| 4 SILICA | | | |

# APPENDIX E

# PARTICULATE MATTER EMISSIONS CALCULATIONS

**Plant:** Clairton Coke Works (U.S. Steel) **Date:** 3/20/90

**Activity No.** 601000-15

# PARTICULATE REPORTING FORM

| Test Number | Component | Molecular Weight | Cyclone Weight | Filter Weight (Particulate) | Insol. Part. in Front Half | Insol. Part. in Back Half (Millipore Filter) | Soluble Part. in Back Half (Impingers 1 & 2 (Acetone & $H_2O$) Total rinses) | Soluble Part. in Front Half (Probe 1 & 2 Acetone & $H_2O$) |
|---|---|---|---|---|---|---|---|---|
| CLR-M1-1 | Particulate | | | 0.0015 | | 0.0027 | 0.0105 | 0.0013 |
| CLR-M3-1 | Particulate | | | 0.0001 | | 0.0029 | 0.0050 | 0.0033 |
| CLR-M4-1 | Particulate | | | 0.0022 | | 0.0020 | 0.0201 | 0.0028 |
| CLR-M5-1 | Particulate | | | 0.0020 | | 0.0036 | 0.0173 | 0.0029 |
| CLR-M6-1 | Particulate | | | 0.0009 | | 0.0029 | 0.0085 | 0.0007 |
| CLR-M7-1 | Particulate | | | 0.0014 | | 0.0054 | 0.0049 | 0.0004 |
| CLR-M8-1 | Particulate | | | 0.0012 | | 0.0030 | 0.0041 | 0.0004 |
| CLR-M9-1 | Particulate | | | 0.0009 | | 0.0029 | 0.0037 | 0.0005 |
| CLR-M10-1 | Particulate | | | 0.0001 | | 0.0028 | 0.0032 | 0.0018 |
| CLR-M11-1 | Particulate | | | 0.0017 | | 0.0020 | 0.0082 | ~~0.0078~~ ~~0.0135~~ 0.002 |
| CLR-M12-1 | Particulate | | | 0.0003 | | 0.0034 | 0.0044 | 0.0015 |
| CLR-M14-1 | Particulate | | | 0.0016 | | 0.0032 | 0.0073 | 0.0016 |
| | | | | | | | | |
| BLK-ACETONE | | Total Weight (g) 0.0000 | | | | | | |
| BLK-$H_2O$ | | 0.0000 | | | | | | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 8

DATE: .....3-12-90
CHARGE #: ...150-601000
TEST #: .....CLR-M8-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00123 | .25092 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 27203. |
| (SCFM) | 24132. |
| MOISTURE CONTENT (%) | 1.61 |
| STACK TEMPERATURE (F) | 124.8 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 57.454 |
| PERCENT ISOKINETIC | 106.37 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 8
CLR-M8-1 3-12-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0SW | 1125.0 | 854.664 | .350 | .56 | .56 | 87. | 84. | 2.9 | 130. | 35.5 |
| 44.8SW | | | .400 | .74 | .74 | 91. | 86. | 3.2 | 124. | 37.7 |
| 42.3SW | | | .450 | .80 | .80 | 91. | 87. | 3.5 | 121. | 39.9 |
| 39.5SW | | | .500 | .92 | .92 | 92. | 87. | 3.6 | 124. | 42.2 |
| 36.0SW | | | .450 | .80 | .80 | 94. | 88. | 3.2 | 124. | 40.0 |
| 30.9SW | | | .450 | .80 | .80 | 98. | 91. | 3.2 | 124. | 40.0 |
| 17.1SW | | | .400 | .74 | .74 | 101. | 93. | 3.1 | 124. | 37.7 |
| 12.0SW | | | .350 | .56 | .56 | 102. | 99. | 2.8 | 119. | 35.1 |
| 8.5SW | | | .350 | .56 | .56 | 103. | 97. | 2.8 | 126. | 35.3 |
| 5.7SW | | | .350 | .56 | .56 | 105. | 99. | 2.8 | 125. | 35.3 |
| 3.2SW | | | .250 | .44 | .44 | 101. | 99. | 2.2 | 123. | 29.8 |
| 1.0SW | 1225.0 | 882.179 | .200 | .38 | .38 | 104. | 100. | 2.0 | 123. | 26.6 |
| 47.0NW | 1445.0 | 882.179 | .100 | .20 | .20 | 98. | 96. | 2.1 | 126. | 18.9 |
| 44.8NW | | | .100 | .20 | .20 | 102. | 98. | 2.1 | 122. | 18.8 |
| 42.3NW | | | .150 | .28 | .28 | 103. | 99. | 2.0 | 132. | 23.3 |
| 39.5NW | | | .150 | .28 | .28 | 103. | 98. | 1.9 | 131. | 23.2 |
| 36.0NW | | | .250 | .44 | .44 | 104. | 99. | 2.3 | 125. | 29.8 |
| 30.9NW | | | .300 | .56 | .56 | 104. | 100. | 2.9 | 128. | 32.8 |
| 17.1NW | | | .500 | .92 | .92 | 106. | 100. | 3.8 | 124. | 42.2 |
| 12.0NW | | | .900 | 1.66 | 1.66 | 107. | 100. | 6.0 | 123. | 56.5 |
| 8.5NW | | | .900 | 1.66 | 1.66 | 108. | 100. | 6.0 | 127. | 56.7 |
| 5.7NW | | | .250 | .44 | .44 | 107. | 100. | 2.3 | 125. | 29.8 |
| 3.2NW | | | .900 | 1.66 | 1.66 | 109. | 101. | 6.0 | 125. | 56.6 |
| 1.0NW | 1545.0 | 914.213 | .500 | .92 | .92 | 108. | 101. | 4.0 | 121. | 42.1 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 5.2 |
| | 2 | 3.9 |
| | 3 | 1.0 |
| | 4 | .0 |
| ABSORBED H2O | | 9.9 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.781 | 12-27-89 |
| METER | 1.0372 | 12-27-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | LT 0.02CFM | 7.0 |

CONTROL BOX NO. 1 PROBE NO. 5-3 NOZZLE NO. 44

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 8
CLR-M8-1 3-12-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.37 |
| B. | AVG. DELTA H (IN H2O)..... | .71 |
| C. | METER PRESSURE (IN. HG.)..... | 29.42 |
| D. | STATIC PRESSURE (IN. H2O)..... | .40 |
| E. | STATIC PRESSURE (IN. HG.)..... | .029 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.40 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2090 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000238 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 584.8 |
| K. | AVG. METER TEMP (DEG. R.)..... | 558.5 |
| L. | CONDENSATE VOL. (ML)..... | 10.1 |
| M. | ABSORBED H2O (ML)..... | 9.9 |
| N. | TOTAL H2O (ML)..... | 20.0 |
| O. | METERED GAS (CF)..... | 59.549 |
| P. | GAS METER CORRECTION..... | 1.0372 |
| Q. | CORRECTED METERED GAS (CF)..... | 61.764 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.014 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 62.778 |
| T. | PERCENT H2O (100R/S)..... | 1.61 |
| | THEORETICAL MAXIMUM..... | 13.46 |
| | PERCENT WATER USED..... | 1.61 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 57.454 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9839 | X | 44.0 | = | .00 |
| CO | .000 | X | .9839 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9839 | X | 32.0 | = | 6.45 |
| N2 | .795 | X | .9839 | X | 28.2 | = | 22.06 |
| H2O | | X | T/100= .0161 | X | 18.0 | = | .29 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.80 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... [85.49*W*SQRT{(J*DELTA P)/(V*F)}] | 36.08 |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 27203. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 24132. |
| | STACK FLOW RATE (DRY)..... | 23742. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | 106.37 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 8
CLR-M8-1 3-12-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00120 | .00000 | .00040 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00300 | .00410 |
| PARTICULATE | .00870 | |
| ALL MATLS. | .00870 | |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00123 | .25092 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 9

DATE: .....3-12-90
CHARGE #: ...150-601000
TEST #: .....CLR-M9-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00102 | .19839 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 26054. |
| (SCFM) | 23185. |
| MOISTURE CONTENT (%) | 1.75 |
| STACK TEMPERATURE (F) | 123.0 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 65.176 |
| PERCENT ISOKINETIC | 102.06 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 9
CLR-M9-1 3-12-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0SW | 1125.0 | 781.116 | .300 | .72 | .72 | 88. | 83. | 2.0 | 124. | 32.7 |
| 44.8SW | | | .300 | .72 | .72 | 91. | 84. | 2.0 | 121. | 32.6 |
| 42.3SW | | | .300 | .72 | .72 | 94. | 85. | 2.0 | 121. | 32.6 |
| 39.5SW | | | .200 | .49 | .49 | 95. | 89. | 2.0 | 119. | 26.6 |
| 36.0SW | | | .200 | .49 | .49 | 98. | 91. | 2.0 | 125. | 26.7 |
| 30.9SW | | | .230 | .56 | .56 | 99. | 91. | 2.0 | 122. | 28.6 |
| 17.1SW | | | .250 | .62 | .62 | 101. | 91. | 2.0 | 119. | 29.7 |
| 12.0SW | | | .350 | .86 | .86 | 102. | 92. | 2.0 | 121. | 35.2 |
| 8.5SW | | | .400 | .99 | .99 | 101. | 96. | 3.0 | 126. | 37.8 |
| 5.7SW | | | .430 | 1.06 | 1.06 | 103. | 96. | 3.5 | 128. | 39.2 |
| 3.2SW | | | .400 | .99 | .99 | 104. | 96. | 3.0 | 123. | 37.7 |
| 1.0SW | 1225.0 | 814.770 | .250 | .62 | .62 | 104. | 96. | 2.0 | 122. | 29.8 |
| 47.0NW | 1445.0 | 814.770 | .600 | 1.48 | 1.48 | 101. | 95. | 4.0 | 122. | 46.1 |
| 44.8NW | | | .800 | 1.98 | 1.98 | 102. | 95. | 6.0 | 121. | 53.2 |
| 42.3NW | | | .800 | 1.98 | 1.98 | 105. | 95. | 6.0 | 131. | 53.7 |
| 39.5NW | | | .700 | 1.74 | 1.74 | 106. | 95. | 6.0 | 128. | 50.1 |
| 36.0NW | | | .600 | 1.47 | 1.47 | 106. | 95. | 5.0 | 123. | 46.2 |
| 30.9NW | | | .400 | .98 | .98 | 106. | 96. | 3.0 | 126. | 37.8 |
| 17.1NW | | | .150 | .37 | .37 | 106. | 96. | 2.0 | 122. | 23.1 |
| 12.0NW | | | .150 | .37 | .37 | 104. | 96. | 2.0 | 121. | 23.0 |
| 8.5NW | | | .200 | .49 | .49 | 104. | 96. | 2.0 | 124. | 26.7 |
| 5.7NW | | | .200 | .49 | .49 | 104. | 96. | 2.0 | 123. | 26.7 |
| 3.2NW | | | .200 | .49 | .49 | 103. | 95. | 2.0 | 119. | 26.6 |
| 1.0NW | 1545.0 | 853.711 | .210 | .52 | .52 | 103. | 95. | 2.0 | 121. | 27.3 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 5.8 |
| | 2 | 2.7 |
| | 3 | 1.1 |
| | 4 | .0 |
| ABSORBED H2O | | 15.0 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.519 | 12-27-89 |
| METER | 0.9624 | 12-27-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | 0.008 CFM | 7.0 |

CONTROL BOX NO. 2 PROBE NO. 5-5 NOZZLE NO. 39

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
CLR-M9-1

MODULE 9
3-12-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG. | 29.37 |
| B. | AVG. DELTA H (IN H2O) | .88 |
| C. | METER PRESSURE (IN. HG.) | 29.43 |
| D. | STATIC PRESSURE (IN. H2O) | .40 |
| E. | STATIC PRESSURE (IN. HG.) | .029 |
| F. | STACK PRESSURE (IN. HG.) (A+E) | 29.40 |
| G. | STACK DIAMETER (IN.) | 48.00 |
| H. | STACK AREA (SQ. FT.) | 12.57 |
| | NOZZLE DIAMETER | .2320 |
| I. | NOZZLE AREA (SQ. FT.) | .000294 |
| J. | AVG. STACK TEMP (DEG. R.) | 583.0 |
| K. | AVG. METER TEMP (DEG. R.) | 557.2 |
| L. | CONDENSATE VOL. (ML) | 9.6 |
| M. | ABSORBED H2O (ML) | 15.0 |
| N. | TOTAL H2O (ML) | 24.6 |
| O. | METERED GAS (CF) | 72.595 |
| P. | GAS METER CORRECTION | .9624 |
| Q. | CORRECTED METERED GAS (CF) | 69.865 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C) | 1.243 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R) | 71.109 |
| T. | PERCENT H2O (100R/S) | 1.75 |
| | THEORETICAL MAXIMUM | 12.75 |
| | PERCENT WATER USED | 1.75 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K)) | 65.176 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9825 | X | 44.0 | = | .00 |
| CO | .000 | X | .9825 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9825 | X | 32.0 | = | 6.45 |
| N2 | .795 | X | .9825 | X | 28.2 | = | 22.03 |
| H2O | | X | T/100= .0175 | X | 18.0 | = | .31 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.79 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS) [85.49*W*SQRT{(J*DELTA P)/(V*F)}] | 34.56 |
| Y. | AVG. FLOW RATE (CFM) (X*H*60) | 26054. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92) | 23185. |
| | STACK FLOW RATE (DRY) | 22780. |
| AA. | SAMPLE TIME (SEC) | 7200. |
| BB. | PERCENT ISOKINETIC (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | 102.06 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 9
CLR-M9-1 3-12-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00090 | .00000 | .00050 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00290 | .00370 |

| | |
|---|---|
| PARTICULATE | .00800 |
| ALL MATLS. | .00800 |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00102 | .19839 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 10

DATE: .....3-12-90
CHARGE #: ...150-601000
TEST #: .....CLR-M10-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00118 | .22070 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 24977. |
| (SCFM) | 22256. |
| MOISTURE CONTENT (%) | 1.73 |
| STACK TEMPERATURE (F) | 122.3 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 61.482 |
| PERCENT ISOKINETIC | 96.09 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
CLR-M10-1

MODULE 10
3-12-90

## FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0SW | 1125.0 | 299.019 | .550 | 1.58 | 1.58 | 90. | 82. | 6.5 | 123. | 44.2 |
| 44.8SW | | | .320 | .90 | .90 | 92. | 83. | 5.0 | 122. | 33.7 |
| 42.3SW | | | .600 | 1.68 | 1.68 | 100. | 88. | 7.0 | 126. | 46.3 |
| 39.5SW | | | .200 | .56 | .56 | 104. | 91. | 3.0 | 118. | 26.5 |
| 36.0SW | | | .400 | 1.12 | 1.12 | 107. | 91. | 5.0 | 122. | 37.7 |
| 30.9SW | | | .370 | 1.04 | 1.04 | 110. | 92. | 4.5 | 120. | 36.2 |
| 17.1SW | | | .200 | .56 | .56 | 111. | 94. | 3.0 | 122. | 26.6 |
| 12.0SW | | | .200 | .56 | .56 | 111. | 95. | 3.0 | 124. | 26.7 |
| 8.5SW | | | .200 | .56 | .56 | 104. | 95. | 3.0 | 129. | 26.8 |
| 5.7SW | | | .200 | .56 | .56 | 107. | 94. | 3.0 | 123. | 26.7 |
| 3.2SW | | | .160 | .46 | .46 | 108. | 95. | 2.5 | 119. | 23.8 |
| 1.0SW | 1225.0 | 331.467 | .160 | .46 | .46 | 109. | 95. | 2.5 | 115. | 23.7 |
| 47.0NW | 1445.0 | 331.467 | .270 | .78 | .78 | 104. | 96. | 4.0 | 118. | 30.8 |
| 44.8NW | | | .360 | 1.04 | 1.04 | 110. | 96. | 5.0 | 126. | 35.8 |
| 42.3NW | | | .360 | 1.04 | 1.04 | 116. | 96. | 5.0 | 127. | 35.9 |
| 39.5NW | | | .310 | .89 | .89 | 117. | 97. | 4.0 | 123. | 33.2 |
| 36.0NW | | | .270 | .78 | .78 | 117. | 98. | 4.0 | 123. | 31.0 |
| 30.9NW | | | .260 | .75 | .75 | 118. | 99. | 4.0 | 123. | 30.4 |
| 17.1NW | | | .340 | .98 | .98 | 120. | 99. | 4.5 | 123. | 34.7 |
| 12.0NW | | | .400 | 1.15 | 1.15 | 122. | 100. | 5.5 | 123. | 37.7 |
| 8.5NW | | | .430 | 1.24 | 1.24 | 121. | 101. | 5.5 | 121. | 39.0 |
| 5.7NW | | | .380 | 1.10 | 1.10 | 120. | 101. | 5.0 | 125. | 36.8 |
| 3.2NW | | | .300 | .87 | .87 | 119. | 101. | 4.0 | 121. | 32.6 |
| 1.0NW | 1545.0 | 367.104 | .420 | 1.21 | 1.21 | 121. | 101. | 5.5 | 118. | 38.5 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 6.5 |
| | 2 | 3.5 |
| | 3 | 1.3 |
| | 4 | .0 |
| ABSORBED H2O | | 11.6 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.634 | 12-28-89 |
| METER | 0.9778 | 12-28-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 7.0 |
| FINAL | 0.013 CFM | 7.0 |

CONTROL BOX NO. 3 PROBE NO. 5-2 NOZZLE NO. 37

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 10
CLR-M10-1 3-12-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.37 |
| B. | AVG. DELTA H (IN H2O)..... | .91 |
| C. | METER PRESSURE (IN. HG.)..... | 29.44 |
| D. | STATIC PRESSURE (IN. H2O)..... | .40 |
| E. | STATIC PRESSURE (IN. HG.)..... | .029 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.40 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2370 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000306 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 582.3 |
| K. | AVG. METER TEMP (DEG. R.)..... | 562.9 |
| L. | CONDENSATE VOL. (ML)..... | 11.3 |
| M. | ABSORBED H2O (ML)..... | 11.6 |
| N. | TOTAL H2O (ML)..... | 22.9 |
| O. | METERED GAS (CF)..... | 68.085 |
| P. | GAS METER CORRECTION..... | .9778 |
| Q. | CORRECTED METERED GAS (CF)..... | 66.574 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.169 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 67.743 |
| T. | PERCENT H2O (100R/S)..... | 1.73 |
| | THEORETICAL MAXIMUM..... | 12.40 |
| | PERCENT WATER USED..... | 1.73 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 61.482 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9827 | X | 44.0 | = | .00 |
| CO | .000 | X | .9827 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9827 | X | 32.0 | = | 6.45 |
| N2 | .795 | X | .9827 | X | 28.2 | = | 22.03 |
| H2O | | X | T/100= .0173 | X | 18.0 | = | .31 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.79 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 33.13 |
| | [85.49*W*SQRT((J*DELTA P)/(V*F))] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 24977. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 22256. |
| | STACK FLOW RATE (DRY)..... | 21872. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 96.09 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
CLR-M10-1

MODULE 10
3-12-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00010 | .00000 | .00180 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00280 | .00320 |

| | |
|---|---|
| PARTICULATE | .00790 |
| ALL MATLS. | .00790 |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00118 | .22070 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 11

DATE: .....3-12-90
CHARGE #: ...150-601000
TEST #: .....CLR-M11-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00188 | .42779 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 30901. |
| (SCFM) | 27037. |
| MOISTURE CONTENT (%) | 1.75 |
| STACK TEMPERATURE (F) | 132.7 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 53.278 |
| PERCENT ISOKINETIC | 95.32 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 11
CLR-M11-1 3-12-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0SW | 1125.0 | 655.561 | .400 | .63 | .63 | 91. | 89. | 5.0 | 130. | 37.9 |
| 44.8SW | | | .450 | .71 | .71 | 91. | 88. | 5.5 | 131. | 40.3 |
| 42.3SW | | | .600 | .95 | .95 | 92. | 91. | 6.5 | 136. | 46.7 |
| 39.5SW | | | .500 | .79 | .79 | 93. | 92. | 6.0 | 131. | 42.4 |
| 36.0SW | | | .450 | .71 | .71 | 94. | 93. | 5.5 | 136. | 40.4 |
| 30.9SW | | | .450 | .71 | .71 | 96. | 94. | 5.5 | 136. | 40.4 |
| 17.1SW | | | .450 | .71 | .71 | 98. | 96. | 5.5 | 133. | 40.3 |
| 12.0SW | | | .500 | .79 | .79 | 99. | 96. | 6.0 | 133. | 42.5 |
| 8.5SW | | | .500 | .79 | .79 | 101. | 102. | 6.0 | 133. | 42.5 |
| 5.7SW | | | .450 | .71 | .71 | 102. | 102. | 5.5 | 132. | 40.3 |
| 3.2SW | | | .400 | .63 | .63 | 102. | 102. | 5.0 | 132. | 38.0 |
| 1.0SW | 1225.0 | 685.913 | .300 | .47 | .47 | 103. | 103. | 4.5 | 130. | 32.8 |
| 47.0NW | 1445.0 | 685.913 | .400 | .63 | .63 | 100. | 102. | 5.0 | 132. | 38.0 |
| 44.8NW | | | .200 | .32 | .32 | 100. | 101. | 4.0 | 127. | 26.7 |
| 42.3NW | | | .250 | .39 | .39 | 100. | 101. | 4.0 | 134. | 30.1 |
| 39.5NW | | | .250 | .39 | .39 | 100. | 101. | 4.0 | 137. | 30.2 |
| 36.0NW | | | .300 | .47 | .47 | 103. | 102. | 4.5 | 133. | 32.9 |
| 30.9NW | | | .300 | .47 | .47 | 103. | 102. | 4.5 | 133. | 32.9 |
| 17.1NW | | | .600 | .95 | .95 | 105. | 104. | 6.0 | 128. | 46.4 |
| 12.0NW | | | .800 | 1.26 | 1.26 | 106. | 106. | 8.0 | 127. | 53.5 |
| 8.5NW | | | .800 | 1.26 | 1.26 | 106. | 107. | 8.0 | 133. | 53.8 |
| 5.7NW | | | .800 | 1.26 | 1.26 | 107. | 108. | 8.0 | 134. | 53.8 |
| 3.2NW | | | .800 | 1.26 | 1.26 | 107. | 108. | 8.0 | 138. | 54.0 |
| 1.0NW | 1545.0 | 715.645 | .600 | .95 | .95 | 108. | 108. | 6.0 | 135. | 46.6 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 4.2 |
| | 2 | 2.0 |
| | 3 | .5 |
| | 4 | .0 |
| ABSORBED H2O | | 13.4 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.762 | 12-28-89 |
| METER | 0.9558 | 12-28-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL LT | 0.02CFM | 5.0 |
| FINAL LT | 0.02CFM | 8.0 |

CONTROL BOX NO. 4 PROBE NO. 5-4 NOZZLE NO. 45

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 11
CLR-M11-1 3-12-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.37 |
| B. | AVG. DELTA H (IN H2O)..... | .76 |
| C. | METER PRESSURE (IN. HG.)..... | 29.43 |
| D. | STATIC PRESSURE (IN. H2O)..... | .20 |
| E. | STATIC PRESSURE (IN. HG.)..... | .015 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.38 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2010 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000220 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 592.7 |
| K. | AVG. METER TEMP (DEG. R.)..... | 560.1 |
| L. | CONDENSATE VOL. (ML)..... | 6.7 |
| M. | ABSORBED H2O (ML)..... | 13.4 |
| N. | TOTAL H2O (ML)..... | 20.1 |
| O. | METERED GAS (CF)..... | 60.084 |
| P. | GAS METER CORRECTION..... | .9558 |
| Q. | CORRECTED METERED GAS (CF)..... | 57.428 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.022 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 58.450 |
| T. | PERCENT H2O (100R/S)..... | 1.75 |
| | THEORETICAL MAXIMUM..... | 16.70 |
| | PERCENT WATER USED..... | 1.75 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 53.278 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9825 | X | 44.0 | = | .00 |
| CO | .000 | X | .9825 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9825 | X | 32.0 | = | 6.45 |
| N2 | .795 | X | .9825 | X | 28.2 | = | 22.03 |
| H2O | | X | T/100= .0175 | X | 18.0 | = | .31 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.79 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 40.98 |
| | [85.49*W*SQRT{(J*DELTA P)/(V*F)}] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 30901. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 27037. |
| | STACK FLOW RATE (DRY)..... | 26564. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 95.32 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 11
CLR-M11-1 3-12-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00170 | .00000 | .00280 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00200 | .00820 |
| PARTICULATE | .01470 | |
| ALL MATLS. | .01470 | |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00188 | .42779 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 1

DATE: .....3-13-90
CHARGE #: ...150-601000
TEST #: .....CLR-M1-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00138 | .33642 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 33091. |
| (SCFM) | 28972. |
| MOISTURE CONTENT (%) | 2.07 |
| STACK TEMPERATURE (F) | 136.2 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 61.230 |
| PERCENT ISOKINETIC | 94.86 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 1
CLR-M1-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0NE | 955.0 | 715.850 | .400 | .72 | .72 | 79. | 78. | 4.5 | 130. | 37.8 |
| 44.8NE | | | .500 | .90 | .90 | 80. | 79. | 5.0 | 125. | 42.1 |
| 42.3NE | | | .600 | 1.08 | 1.08 | 82. | 80. | 6.0 | 122. | 46.0 |
| 39.5NE | | | .600 | 1.08 | 1.08 | 83. | 81. | 6.0 | 131. | 46.4 |
| 36.0NE | | | .500 | .90 | .90 | 85. | 83. | 5.0 | 134. | 42.4 |
| 30.9NE | | | .500 | .90 | .90 | 87. | 86. | 5.0 | 136. | 42.5 |
| 17.1NE | | | .500 | .90 | .90 | 89. | 87. | 5.0 | 136. | 42.5 |
| 12.0NE | | | .600 | 1.08 | 1.08 | 90. | 89. | 6.0 | 134. | 46.5 |
| 8.5NE | | | .400 | .72 | .72 | 93. | 91. | 4.5 | 137. | 38.0 |
| 5.7NE | | | .600 | 1.09 | 1.09 | 94. | 93. | 6.0 | 136. | 46.6 |
| 3.2NE | | | .600 | 1.09 | 1.09 | 95. | 94. | 6.0 | 138. | 46.6 |
| 1.0NE | 1055.0 | 748.490 | .400 | .72 | .72 | 96. | 95. | 6.0 | 136. | 38.0 |
| 47.0SE | 1125.0 | 748.490 | .400 | .72 | .72 | 93. | 94. | 4.5 | 140. | 38.1 |
| 44.8SE | | | .400 | .72 | .72 | 94. | 95. | 4.5 | 140. | 38.1 |
| 42.3SE | | | .400 | .72 | .72 | 95. | 95. | 4.5 | 138. | 38.1 |
| 39.5SE | | | .400 | .72 | .72 | 95. | 95. | 4.5 | 138. | 38.1 |
| 36.0SE | | | .400 | .72 | .72 | 96. | 96. | 4.5 | 140. | 38.1 |
| 30.9SE | | | .400 | .72 | .72 | 97. | 97. | 4.5 | 140. | 38.1 |
| 17.1SE | | | .600 | 1.08 | 1.08 | 98. | 97. | 6.0 | 140. | 46.7 |
| 12.0SE | | | .600 | 1.08 | 1.08 | 98. | 98. | 6.0 | 142. | 46.8 |
| 8.5SE | | | .800 | 1.45 | 1.45 | 100. | 99. | 7.5 | 142. | 54.0 |
| 5.7SE | | | .800 | 1.45 | 1.45 | 100. | 100. | 7.5 | 138. | 53.9 |
| 3.2SE | | | .800 | 1.45 | 1.45 | 101. | 100. | 7.5 | 138. | 53.9 |
| 1.0SE | 1225.0 | 783.470 | .800 | 1.45 | 1.45 | 101. | 100. | 7.5 | 138. | 53.9 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 9.9 |
| | 2 | 4.4 |
| | 3 | 1.5 |
| | 4 | .0 |
| ABSORBED H2O | | 11.6 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.762 | 12-28-89 |
| METER | 0.9558 | 12-28-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | 0.010 CFM | 8.0 |

CONTROL BOX NO. 4 PROBE NO. 5-3 NOZZLE NO. 44

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 1
CLR-M1-1 3-13-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.55 |
| B. | AVG. DELTA H (IN H2O)..... | .98 |
| C. | METER PRESSURE (IN. HG.)..... | 29.62 |
| D. | STATIC PRESSURE (IN. H2O)..... | .40 |
| E. | STATIC PRESSURE (IN. HG.)..... | .029 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.58 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2090 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000238 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 596.2 |
| K. | AVG. METER TEMP (DEG. R.)..... | 552.1 |
| L. | CONDENSATE VOL. (ML)..... | 15.8 |
| M. | ABSORBED H2O (ML)..... | 11.6 |
| N. | TOTAL H2O (ML)..... | 27.4 |
| O. | METERED GAS (CF)..... | 67.620 |
| P. | GAS METER CORRECTION..... | .9558 |
| Q. | CORRECTED METERED GAS (CF)..... | 64.631 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.364 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 65.995 |
| T. | PERCENT H2O (100R/S)..... | 2.07 |
| | THEORETICAL MAXIMUM..... | 17.94 |
| | PERCENT WATER USED..... | 2.07 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 61.230 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9793 | X | 44.0 | = | .00 |
| CO | .000 | X | .9793 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9793 | X | 32.0 | = | 6.42 |
| N2 | .795 | X | .9793 | X | 28.2 | = | 21.96 |
| H2O | | X | T/100= .0207 | X | 18.0 | = | .37 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.75 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 43.89 |
| | [85.49*W*SQRT{(J*DELTA P)/(V*F)}] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 33091. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 28972. |
| | STACK FLOW RATE (DRY)..... | 28373. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 94.86 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 1
CLR-M1-1 3-13-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00150 | .00000 | .00130 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00270 | .01050 |
| PARTICULATE | .01600 | |
| ALL MATLS. | .01600 | |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00138 | .33642 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 3

DATE: .....3-13-90
CHARGE #: ...150-601000
TEST #: .....CLR-M3-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00117 | .30174 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 34611. |
| (SCFM) | 30792. |
| MOISTURE CONTENT (%) | 1.87 |
| STACK TEMPERATURE (F) | 126.6 |

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3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 83.279 |
| PERCENT ISOKINETIC | 98.31 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 3
CLR-M3-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0NE | 955.0 | 855.392 | .600 | 1.46 | 1.46 | 84. | 79. | 10.0 | 122. | 46.0 |
| 44.8NE | | | .600 | 1.46 | 1.46 | 89. | 81. | 10.0 | 117. | 45.8 |
| 42.3NE | | | .700 | 1.70 | 1.70 | 91. | 82. | 13.0 | 115. | 49.4 |
| 39.5NE | | | .600 | 1.46 | 1.46 | 92. | 84. | 11.0 | 125. | 46.1 |
| 36.0NE | | | .600 | 1.46 | 1.46 | 93. | 85. | 11.0 | 120. | 45.9 |
| 30.9NE | | | .500 | 1.22 | 1.22 | 95. | 86. | 8.2 | 126. | 42.1 |
| 17.1NE | | | .500 | 1.22 | 1.22 | 96. | 87. | 8.8 | 123. | 42.0 |
| 12.0NE | | | .600 | 1.46 | 1.46 | 97. | 87. | 10.4 | 119. | 45.9 |
| 8.5NE | | | .700 | 1.70 | 1.70 | 98. | 88. | 12.3 | 129. | 50.0 |
| 5.7NE | | | .700 | 1.70 | 1.70 | 97. | 89. | 12.3 | 124. | 49.8 |
| 3.2NE | | | .700 | 1.70 | 1.70 | 97. | 89. | 12.3 | 123. | 49.7 |
| 1.0NE | 1055.0 | 901.468 | .600 | 1.46 | 1.46 | 98. | 90. | 10.8 | 121. | 46.0 |
| 47.0SE | 1125.0 | 901.468 | .400 | .97 | .97 | 94. | 91. | 7.0 | 133. | 37.9 |
| 44.8SE | | | .400 | .97 | .97 | 98. | 92. | 7.0 | 126. | 37.7 |
| 42.3SE | | | .400 | .97 | .97 | 100. | 92. | 7.0 | 139. | 38.1 |
| 39.5SE | | | .200 | .49 | .49 | 100. | 92. | 4.0 | 127. | 26.7 |
| 36.0SE | | | .300 | .73 | .73 | 101. | 92. | 5.3 | 133. | 32.8 |
| 30.9SE | | | .400 | .97 | .97 | 101. | 93. | 7.0 | 138. | 38.1 |
| 17.1SE | | | .600 | 1.46 | 1.46 | 102. | 93. | 10.3 | 126. | 46.2 |
| 12.0SE | | | .800 | 1.95 | 1.95 | 101. | 93. | 14.0 | 134. | 53.7 |
| 8.5SE | | | 1.000 | 2.44 | 2.44 | 104. | 93. | 15.0 | 130. | 59.8 |
| 5.7SE | | | 1.200 | 2.92 | 2.92 | 106. | 94. | 16.0 | 127. | 65.3 |
| 3.2SE | | | .900 | 2.19 | 2.19 | 106. | 95. | 14.5 | 132. | 56.8 |
| 1.0SE | 1225.0 | 946.832 | .700 | 1.70 | 1.70 | 105. | 94. | 12.0 | 129. | 50.0 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 7.0 |
| | 2 | 8.1 |
| | 3 | 2.7 |
| | 4 | .0 |
| ABSORBED H2O | | 15.8 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.519 | 12-27-89 |
| METER | 0.9624 | 12-27-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | 0.010 CFM | 15.0 |

CONTROL BOX NO. 2 PROBE NO. 5-5 NOZZLE NO. 39

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 3
CLR-M3-1 3-13-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.55 |
| B. | AVG. DELTA H (IN H2O)..... | 1.49 |
| C. | METER PRESSURE (IN. HG.)..... | 29.66 |
| D. | STATIC PRESSURE (IN. H2O)..... | .30 |
| E. | STATIC PRESSURE (IN. HG.)..... | .022 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.57 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2320 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000294 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 586.6 |
| K. | AVG. METER TEMP (DEG. R.)..... | 553.5 |
| L. | CONDENSATE VOL. (ML)..... | 17.8 |
| M. | ABSORBED H2O (ML)..... | 15.8 |
| N. | TOTAL H2O (ML)..... | 33.6 |
| O. | METERED GAS (CF)..... | 91.440 |
| P. | GAS METER CORRECTION..... | .9624 |
| Q. | CORRECTED METERED GAS (CF)..... | 88.002 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.674 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 89.676 |
| T. | PERCENT H2O (100R/S)..... | 1.87 |
| | THEORETICAL MAXIMUM..... | 14.13 |
| | PERCENT WATER USED..... | 1.87 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 83.279 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9813 | X | 44.0 | = | .00 |
| CO | .000 | X | .9813 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9813 | X | 32.0 | = | 6.44 |
| N2 | .795 | X | .9813 | X | 28.2 | = | 22.00 |
| H2O | | X | T/100= .0187 | X | 18.0 | = | .34 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.77 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 45.90 |
| | [85.49*W*SQRT{(J*DELTA P)/(V*F)}] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 34611. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 30792. |
| | STACK FLOW RATE (DRY)..... | 30217. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 98.31 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 3
CLR-M3-1 3-13-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00010 | .00000 | .00330 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00290 | .00500 |

| | |
|---|---|
| PARTICULATE | .01130 |
| ALL MATLS. | .01130 |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00117 | .30174 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 4

DATE: .....3-13-90
CHARGE #: ...150-601000
TEST #: .....CLR-M4-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00131 | .33508 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 34955. |
| (SCFM) | 30075. |
| MOISTURE CONTENT (%) | 1.09 |
| STACK TEMPERATURE (F) | 146.5 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 82.031 |
| PERCENT ISOKINETIC | 98.37 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 4
CLR-M4-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0NE | 1425.0 | 947.127 | .300 | .71 | .71 | 96. | 93. | 4.1 | 148. | 33.2 |
| 44.8NE | | | .300 | .71 | .71 | 101. | 94. | 4.1 | 146. | 33.1 |
| 42.3NE | | | .300 | .71 | .71 | 102. | 95. | 4.1 | 149. | 33.2 |
| 39.5NE | | | .400 | .95 | .95 | 102. | 94. | 5.3 | 156. | 38.6 |
| 36.0NE | | | .400 | .95 | .95 | 103. | 95. | 5.3 | 147. | 38.3 |
| 30.9NE | | | .500 | 1.19 | 1.19 | 104. | 96. | 7.0 | 151. | 43.0 |
| 17.1NE | | | .600 | 1.43 | 1.43 | 104. | 96. | 8.2 | 147. | 46.9 |
| 12.0NE | | | .800 | 1.90 | 1.90 | 103. | 96. | 11.9 | 146. | 54.1 |
| 8.5NE | | | .900 | 2.14 | 2.14 | 101. | 95. | 14.7 | 158. | 58.0 |
| 5.7NE | | | 1.000 | 2.34 | 2.34 | 99. | 94. | 15.6 | 151. | 60.8 |
| 3.2NE | | | 1.000 | 2.34 | 2.34 | 97. | 93. | 15.6 | 148. | 60.6 |
| 1.0NE | 1525.0 | 990.405 | .200 | .47 | .47 | 97. | 92. | 3.0 | 143. | 27.0 |
| 47.0SE | 1545.0 | 990.405 | .800 | 1.87 | 1.87 | 99. | 95. | 11.3 | 147. | 54.2 |
| 44.8SE | | | .800 | 1.87 | 1.87 | 102. | 96. | 11.3 | 144. | 54.0 |
| 42.3SE | | | .700 | 1.64 | 1.64 | 103. | 96. | 10.0 | 142. | 50.5 |
| 39.5SE | | | .700 | 1.64 | 1.64 | 105. | 96. | 10.0 | 140. | 50.4 |
| 36.0SE | | | .500 | 1.17 | 1.17 | 106. | 97. | 7.0 | 140. | 42.6 |
| 30.9SE | | | .500 | 1.17 | 1.17 | 107. | 98. | 7.0 | 138. | 42.5 |
| 17.1SE | | | .600 | 1.40 | 1.40 | 108. | 99. | 7.8 | 150. | 47.0 |
| 12.0SE | | | .800 | 1.87 | 1.87 | 107. | 98. | 11.2 | 145. | 54.1 |
| 8.5SE | | | .200 | .47 | .47 | 106. | 99. | 2.9 | 152. | 27.2 |
| 5.7SE | | | 1.000 | 2.34 | 2.34 | 108. | 99. | 15.3 | 146. | 60.5 |
| 3.2SE | | | 1.000 | 2.34 | 2.34 | 105. | 99. | 15.3 | 150. | 60.7 |
| 1.0SE | 1645.0 | 1038.179 | .500 | 1.17 | 1.17 | 104. | 99. | 7.0 | 133. | 42.3 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 2.1 |
| | 2 | .2 |
| | 3 | 2.0 |
| | 4 | .0 |
| ABSORBED H2O | | 14.8 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.519 | 12-27-89 |
| METER | 0.9624 | 12-27-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | 0.010 CFM | 15.0 |

CONTROL BOX NO. 2 PROBE NO. 5-5 NOZZLE NO. 39

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 4
CLR-M4-1 3-13-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.55 |
| B. | AVG. DELTA H (IN H2O)..... | 1.45 |
| C. | METER PRESSURE (IN. HG.)..... | 29.66 |
| D. | STATIC PRESSURE (IN. H2O)..... | .30 |
| E. | STATIC PRESSURE (IN. HG.)..... | .022 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.57 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2320 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000294 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 606.5 |
| K. | AVG. METER TEMP (DEG. R.)..... | 559.4 |
| L. | CONDENSATE VOL. (ML)..... | 4.3 |
| M. | ABSORBED H2O (ML)..... | 14.8 |
| N. | TOTAL H2O (ML)..... | 19.1 |
| O. | METERED GAS (CF)..... | 91.052 |
| P. | GAS METER CORRECTION..... | .9624 |
| Q. | CORRECTED METERED GAS (CF)..... | 87.628 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | .962 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 88.590 |
| T. | PERCENT H2O (100R/S)..... | 1.09 |
| | THEORETICAL MAXIMUM..... | 23.78 |
| | PERCENT WATER USED..... | 1.09 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 82.031 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9891 | X | 44.0 | = | .00 |
| CO | .000 | X | .9891 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9891 | X | 32.0 | = | 6.49 |
| N2 | .795 | X | .9891 | X | 28.2 | = | 22.18 |
| H2O | | X | T/100= .0109 | X | 18.0 | = | .20 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.86 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 46.36 |
| | [85.49*W*SQRT((J*DELTA P)/(V*F))] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 34955. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 30075. |
| | STACK FLOW RATE (DRY)..... | 29748. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 98.37 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 4
CLR-M4-1 3-13-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00220 | .00000 | .00280 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00200 | .02010 |
| PARTICULATE | .02710 | |
| ALL MATLS. | .02710 | |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00131 | .33508 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 5

DATE: .....3-13-90
CHARGE #: ...150-601000
TEST #: .....CLR-M5-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00253 | .51420 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 28121. |
| (SCFM) | 24242. |
| MOISTURE CONTENT (%) | 2.25 |
| STACK TEMPERATURE (F) | 145.4 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 51.707 |
| PERCENT ISOKINETIC | 95.91 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 5
CLR-M5-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FFT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0NE | 1425.0 | 783.600 | .300 | .54 | .54 | 95. | 96. | 5.0 | 146. | 33.2 |
| 44.8NE | | | .300 | .54 | .54 | 97. | 96. | 5.0 | 149. | 33.3 |
| 42.3NE | | | .300 | .54 | .54 | 98. | 97. | 5.0 | 148. | 33.3 |
| 39.5NE | | | .300 | .54 | .54 | 98. | 97. | 5.0 | 142. | 33.1 |
| 36.0NE | | | .350 | .64 | .64 | 101. | 99. | 5.0 | 139. | 35.7 |
| 30.9NE | | | .400 | .73 | .73 | 102. | 101. | 5.0 | 149. | 38.4 |
| 17.1NE | | | .500 | .91 | .91 | 104. | 103. | 6.0 | 147. | 42.9 |
| 12.0NE | | | .500 | .91 | .91 | 104. | 104. | 6.0 | 145. | 42.8 |
| 8.5NE | | | .500 | .91 | .91 | 104. | 104. | 6.0 | 150. | 43.0 |
| 5.7NE | | | .400 | .73 | .73 | 104. | 104. | 6.0 | 149. | 38.4 |
| 3.2NE | | | .400 | .73 | .73 | 104. | 104. | 6.0 | 144. | 38.3 |
| 1.0NE | 1525.0 | 812.564 | .400 | .73 | .73 | 104. | 104. | 6.0 | 144. | 38.3 |
| 47.0SE | 1545.0 | 812.564 | .300 | .54 | .54 | 105. | 107. | 5.0 | 145. | 33.2 |
| 44.8SE | | | .300 | .54 | .54 | 105. | 107. | 5.0 | 146. | 33.2 |
| 42.3SE | | | .400 | .73 | .73 | 107. | 107. | 5.0 | 143. | 38.3 |
| 39.5SE | | | .400 | .73 | .73 | 107. | 107. | 5.0 | 145. | 38.3 |
| 36.0SE | | | .400 | .73 | .73 | 107. | 107. | 5.0 | 146. | 38.4 |
| 30.9SE | | | .400 | .73 | .73 | 107. | 108. | 5.0 | 141. | 38.2 |
| 17.1SE | | | .400 | .73 | .73 | 107. | 108. | 5.0 | 140. | 38.2 |
| 12.0SE | | | .400 | .73 | .73 | 108. | 108. | 5.0 | 144. | 38.3 |
| 8.5SE | | | .400 | .73 | .73 | 108. | 108. | 5.0 | 148. | 38.4 |
| 5.7SE | | | .400 | .73 | .73 | 108. | 108. | 5.0 | 146. | 38.4 |
| 3.2SE | | | .400 | .73 | .73 | 108. | 108. | 5.0 | 145. | 38.3 |
| 1.0SE | 1645.0 | 841.990 | .300 | .54 | .54 | 108. | 109. | 5.0 | 148. | 33.3 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 5.0 |
| | 2 | 3.3 |
| | 3 | 1.7 |
| | 4 | .0 |
| ABSORBED H2O | | 15.2 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.762 | 12-28-89 |
| METER | 0.9558 | 12-28-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | 0.010 CFM | 6.0 |

CONTROL BOX NO. 4 PROBE NO. 5-3 NOZZLE NO. 44

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 5
CLR-M5-1 3-13-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.55 |
| B. | AVG. DELTA H (IN H2O)..... | .69 |
| C. | METER PRESSURE (IN. HG.)..... | 29.60 |
| D. | STATIC PRESSURE (IN. H2O)..... | .30 |
| E. | STATIC PRESSURE (IN. HG.)..... | .022 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.57 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2090 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000238 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 605.4 |
| K. | AVG. METER TEMP (DEG. R.)..... | 564.2 |
| L. | CONDENSATE VOL. (ML)..... | 10.0 |
| M. | ABSORBED H2O (ML)..... | 15.2 |
| N. | TOTAL H2O (ML)..... | 25.2 |
| O. | METERED GAS (CF)..... | 58.390 |
| P. | GAS METER CORRECTION..... | .9558 |
| Q. | CORRECTED METERED GAS (CF)..... | 55.809 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.282 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 57.092 |
| T. | PERCENT H2O (100R/S)..... | 2.25 |
| | THEORETICAL MAXIMUM..... | 22.61 |
| | PERCENT WATER USED..... | 2.25 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 51.707 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9775 | X | 44.0 | = | .00 |
| CO | .000 | X | .9775 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9775 | X | 32.0 | = | 6.41 |
| N2 | .795 | X | .9775 | X | 28.2 | = | 21.92 |
| H2O | | X | T/100= .0225 | X | 18.0 | = | .40 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.73 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 37.30 |
| | [85.49*W*SQRT{(J*DELTA P)/(V*F)}] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 28121. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 24242. |
| | STACK FLOW RATE (DRY)..... | 23697. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 95.91 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
CLR-M5-1

MODULE 5
3-13-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00200 | .00000 | .00290 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00360 | .01730 |

| | |
|---|---|
| PARTICULATE | .02580 |
| ALL MATLS. | .02580 |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00253 | .51420 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 6

DATE: .....3-13-90
CHARGE #: ...150-601000
TEST #: .....CLR-M6-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00126 | .27564 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 30160. |
| (SCFM) | 26041. |
| MOISTURE CONTENT (%) | 2.06 |
| STACK TEMPERATURE (F) | 144.4 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 54.961 |
| PERCENT ISOKINETIC | 102.41 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 6
CLR-M6-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0NE | 1425.0 | 426.372 | .250 | .35 | .35 | 98. | 91. | 2.0 | 150. | 30.4 |
| 44.8NE | | | .250 | .35 | .35 | 103. | 93. | 2.0 | 150. | 30.4 |
| 42.3NE | | | .270 | .38 | .38 | 106. | 94. | 2.0 | 147. | 31.5 |
| 39.5NE | | | .270 | .38 | .38 | 107. | 94. | 2.0 | 145. | 31.5 |
| 36.0NE | | | .270 | .39 | .39 | 109. | 94. | 2.0 | 147. | 31.5 |
| 30.9NE | | | .300 | .43 | .43 | 109. | 95. | 2.5 | 150. | 33.3 |
| 17.1NE | | | .500 | .72 | .72 | 110. | 95. | 3.0 | 147. | 42.9 |
| 12.0NE | | | .600 | .86 | .86 | 110. | 94. | 3.5 | 146. | 47.0 |
| 8.5NE | | | .600 | .86 | .86 | 110. | 94. | 3.5 | 152. | 47.2 |
| 5.7NE | | | .700 | 1.00 | 1.00 | 110. | 93. | 4.0 | 147. | 50.8 |
| 3.2NE | | | .600 | .86 | .86 | 110. | 93. | 3.5 | 143. | 46.8 |
| 1.0NE | 1525.0 | 456.480 | .400 | .57 | .57 | 110. | 93. | 2.5 | 139. | 38.1 |
| 47.0SE | 1545.0 | 456.480 | .400 | .57 | .57 | 101. | 92. | 2.0 | 145. | 38.3 |
| 44.8SE | | | .400 | .57 | .57 | 107. | 93. | 2.5 | 143. | 38.2 |
| 42.3SE | | | .500 | .71 | .71 | 109. | 95. | 3.0 | 141. | 42.7 |
| 39.5SE | | | .500 | .71 | .71 | 111. | 95. | 3.0 | 140. | 42.7 |
| 36.0SE | | | .500 | .72 | .72 | 112. | 96. | 3.0 | 138. | 42.6 |
| 30.9SE | | | .500 | .72 | .72 | 113. | 96. | 3.0 | 136. | 42.5 |
| 17.1SE | | | .400 | .58 | .58 | 113. | 97. | 2.5 | 146. | 38.3 |
| 12.0SE | | | .500 | .72 | .72 | 114. | 97. | 3.0 | 143. | 42.8 |
| 8.5SE | | | .500 | .72 | .72 | 114. | 97. | 3.0 | 148. | 42.9 |
| 5.7SE | | | .600 | .87 | .87 | 115. | 98. | 3.5 | 142. | 46.8 |
| 3.2SE | | | .500 | .72 | .72 | 115. | 98. | 3.0 | 141. | 42.7 |
| 1.0SE | 1645.0 | 486.838 | .400 | .58 | .58 | 115. | 99. | 2.5 | 140. | 38.1 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 6.8 |
| | 2 | 1.6 |
| | 3 | 1.9 |
| | 4 | .0 |
| ABSORBED H2O | | 14.2 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.634 | 12-28-89 |
| METER | 0.9778 | 12-28-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | 0.005 CFM | 6.0 |

CONTROL BOX NO. 3 PROBE NO. 5-4 NOZZLE NO. 45

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 6
CLR-M6-1 3-13-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.55 |
| B. | AVG. DELTA H (IN H2O)..... | .64 |
| C. | METER PRESSURE (IN. HG.)..... | 29.60 |
| D. | STATIC PRESSURE (IN. H2O)..... | .30 |
| E. | STATIC PRESSURE (IN. HG.)..... | .022 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.57 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2010 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000220 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 604.4 |
| K. | AVG. METER TEMP (DEG. R.)..... | 562.2 |
| L. | CONDENSATE VOL. (ML)..... | 10.3 |
| M. | ABSORBED H2O (ML)..... | 14.2 |
| N. | TOTAL H2O (ML)..... | 24.5 |
| O. | METERED GAS (CF)..... | 60.466 |
| P. | GAS METER CORRECTION..... | .9778 |
| Q. | CORRECTED METERED GAS (CF)..... | 59.124 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.243 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 60.366 |
| T. | PERCENT H2O (100R/S)..... | 2.06 |
| | THEORETICAL MAXIMUM..... | 22.05 |
| | PERCENT WATER USED..... | 2.06 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 54.961 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9794 | X | 44.0 | = | .00 |
| CO | .000 | X | .9794 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9794 | X | 32.0 | = | 6.42 |
| N2 | .795 | X | .9794 | X | 28.2 | = | 21.96 |
| H2O | | X | T/100= .0206 | X | 18.0 | = | .37 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.75 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 40.00 |
| | [85.49*W*SQRT{(J*DELTA P)/(V*F)}] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 30160. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 26041. |
| | STACK FLOW RATE (DRY)..... | 25505. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 102.41 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
CLR-M6-1

MODULE 6
3-13-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00090 | .00000 | .00070 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00290 | .00850 |

| | |
|---|---|
| PARTICULATE | .01300 |
| ALL MATLS. | .01300 |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00126 | .27564 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 7

DATE: .....3-13-90
CHARGE #: ...150-601000
TEST #: .....CLR-M7-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00142 | .33928 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 32167. |
| (SCFM) | 28459. |
| MOISTURE CONTENT (%) | 1.76 |
| STACK TEMPERATURE (F) | 130.0 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 78.321 |
| PERCENT ISOKINETIC | 95.75 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 7
CLR-M7-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FFT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0NE | 1425.0 | 994.528 | .250 | .63 | .63 | 98. | 93. | 3.0 | 138. | 30.1 |
| 44.8NE | | | .550 | 1.39 | 1.39 | 104. | 99. | 5.5 | 140. | 44.7 |
| 42.3NE | | | .800 | 2.02 | 2.02 | 107. | 100. | 8.1 | 137. | 53.8 |
| 39.5NE | | | .750 | 1.89 | 1.89 | 109. | 100. | 7.5 | 131. | 51.8 |
| 36.0NE | | | .800 | 2.02 | 2.02 | 111. | 103. | 8.0 | 134. | 53.6 |
| 30.9NE | | | .600 | 1.51 | 1.51 | 111. | 104. | 6.6 | 135. | 46.5 |
| 17.1NE | | | .450 | 1.14 | 1.14 | 111. | 105. | 5.0 | 135. | 40.3 |
| 12.0NE | | | .450 | 1.14 | 1.14 | 110. | 105. | 5.0 | 135. | 40.3 |
| 8.5NE | | | .350 | .88 | .88 | 108. | 105. | 4.0 | 134. | 35.5 |
| 5.7NE | | | .300 | .76 | .76 | 108. | 105. | 3.5 | 130. | 32.7 |
| 3.2NE | | | .300 | .76 | .76 | 108. | 105. | 3.5 | 130. | 32.7 |
| 1.0NE | 1525.0 | 1034.071 | .250 | .63 | .63 | 110. | 104. | 3.2 | 120. | 29.6 |
| 47.0SE | 1545.0 | 34.071 | .250 | .63 | .63 | 104. | 104. | 3.0 | 135. | 30.0 |
| 44.8SE | | | .250 | .63 | .63 | 109. | 105. | 3.0 | 132. | 29.9 |
| 42.3SE | | | .250 | .63 | .63 | 110. | 105. | 3.0 | 131. | 29.9 |
| 39.5SE | | | .250 | .63 | .63 | 109. | 104. | 3.0 | 130. | 29.9 |
| 36.0SE | | | .300 | .76 | .76 | 110. | 104. | 3.2 | 127. | 32.7 |
| 30.9SE | | | .300 | .76 | .76 | 110. | 104. | 3.2 | 125. | 32.6 |
| 17.1SE | | | .800 | 2.02 | 2.02 | 112. | 105. | 7.5 | 132. | 53.6 |
| 12.0SE | | | .950 | 2.40 | 2.40 | 113. | 105. | 9.0 | 130. | 58.3 |
| 8.5SE | | | 1.000 | 2.52 | 2.52 | 113. | 104. | 9.5 | 136. | 60.1 |
| 5.7SE | | | 1.000 | 2.52 | 2.52 | 113. | 104. | 9.6 | 134. | 60.0 |
| 3.2SE | | | 1.000 | 2.52 | 2.52 | 113. | 104. | 9.8 | 119. | 59.2 |
| 1.0SE | 1645.0 | 76.200 | .950 | 2.40 | 2.40 | 113. | 104. | 8.9 | 90. | 56.2 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 6.1 |
| | 2 | 8.7 |
| | 3 | 1.2 |
| | 4 | .0 |
| ABSORBED H2O | | 13.7 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.781 | 12-27-89 |
| METER | 1.0372 | 12-27-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | 0.010 CFM | 11.0 |

CONTROL BOX NO. 1 PROBE NO. 5-2 NOZZLE NO. 37

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 7
CLR-M7-1 3-13-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.55 |
| B. | AVG. DELTA H (IN H2O)..... | 1.38 |
| C. | METER PRESSURE (IN. HG.)..... | 29.65 |
| D. | STATIC PRESSURE (IN. H2O)..... | .40 |
| E. | STATIC PRESSURE (IN. HG.)..... | .029 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.58 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2370 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000306 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 590.0 |
| K. | AVG. METER TEMP (DEG. R.)..... | 566.3 |
| L. | CONDENSATE VOL. (ML)..... | 16.0 |
| M. | ABSORBED H2O (ML)..... | 13.7 |
| N. | TOTAL H2O (ML)..... | 29.7 |
| O. | METERED GAS (CF)..... | 81.672 |
| P. | GAS METER CORRECTION..... | 1.0372 |
| Q. | CORRECTED METERED GAS (CF)..... | 84.710 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.515 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 86.225 |
| T. | PERCENT H2O (100R/S)..... | 1.76 |
| | THEORETICAL MAXIMUM..... | 15.31 |
| | PERCENT WATER USED..... | 1.76 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 78.321 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9824 | X | 44.0 | = | .00 |
| CO | .000 | X | .9824 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9824 | X | 32.0 | = | 6.44 |
| N2 | .795 | X | .9824 | X | 28.2 | = | 22.03 |
| H2O | | X | T/100= .0176 | X | 18.0 | = | .32 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.79 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 42.66 |
| | [85.49*W*SQRT((J*DELTA P)/(V*F))] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 32167. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 28459. |
| | STACK FLOW RATE (DRY)..... | 27960. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 95.75 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 7
CLR-M7-1 3-13-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00140 | .00000 | .00040 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00540 | .00490 |
| PARTICULATE | .01210 | |
| ALL MATLS. | .01210 | |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00142 | .33928 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 12
CLR-M12-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0SW | 955.0 | 914.921 | .250 | .74 | .74 | 78. | 75. | 5.0 | 119. | 29.6 |
| 44.8SW | | | .250 | .74 | .74 | 84. | 78. | 6.0 | 119. | 29.6 |
| 42.3SW | | | .300 | .89 | .89 | 87. | 80. | 6.1 | 117. | 32.4 |
| 39.5SW | | | .300 | .89 | .89 | 90. | 82. | 6.5 | 124. | 32.6 |
| 36.0SW | | | .300 | .89 | .89 | 92. | 84. | 6.5 | 123. | 32.6 |
| 30.9SW | | | .300 | .89 | .89 | 93. | 85. | 6.5 | 124. | 32.6 |
| 17.1SW | | | .450 | 1.35 | 1.35 | 95. | 87. | 9.4 | 120. | 39.8 |
| 12.0SW | | | .600 | 1.79 | 1.79 | 97. | 87. | 12.0 | 118. | 45.9 |
| 8.5SW | | | .650 | 1.94 | 1.94 | 97. | 87. | 14.0 | 126. | 48.1 |
| 5.7SW | | | .600 | 1.79 | 1.79 | 96. | 89. | 13.8 | 124. | 46.1 |
| 3.2SW | | | .600 | 1.79 | 1.79 | 97. | 90. | 13.6 | 119. | 45.9 |
| 1.0SW | 1055.0 | 953.249 | .400 | 1.19 | 1.19 | 97. | 90. | 9.0 | 110. | 37.2 |
| 47.0NW | 1125.0 | 953.249 | .250 | .74 | .74 | 91. | 88. | 6.0 | 127. | 29.8 |
| 44.8NW | | | .250 | .74 | .74 | 95. | 90. | 6.0 | 124. | 29.8 |
| 42.3NW | | | .250 | .74 | .74 | 97. | 91. | 6.1 | 133. | 30.0 |
| 39.5NW | | | .250 | .74 | .74 | 98. | 91. | 6.0 | 127. | 29.8 |
| 36.0NW | | | .250 | .74 | .74 | 99. | 92. | 6.0 | 129. | 29.9 |
| 30.9NW | | | .250 | .74 | .74 | 100. | 93. | 6.0 | 131. | 29.9 |
| 17.1NW | | | .450 | 1.34 | 1.34 | 102. | 94. | 9.0 | 125. | 40.0 |
| 12.0NW | | | .500 | 1.49 | 1.49 | 102. | 95. | 10.0 | 131. | 42.3 |
| 8.5NW | | | .550 | 1.64 | 1.64 | 103. | 96. | 11.0 | 128. | 44.3 |
| 5.7NW | | | .700 | 2.09 | 2.09 | 103. | 96. | 14.8 | 100. | 48.8 |
| 3.2NW | | | .800 | 2.38 | 2.38 | 106. | 99. | 5.5 | 121. | 53.1 |
| 1.0NW | 1225.0 | 993.800 | .500 | 1.49 | 1.49 | 105. | 95. | 4.0 | 93. | 41.0 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 9.2 |
| | 2 | 7.8 |
| | 3 | 2.9 |
| | 4 | .0 |
| ABSORBED H2O | | 16.6 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.781 | 12-27-89 |
| METER | 1.0372 | 12-27-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | 0.010 CFM | 15.0 |

CONTROL BOX NO. 1 PROBE NO. 5-2 NOZZLE NO. 37

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 12
CLR-M12-1 3-13-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.55 |
| B. | AVG. DELTA H (IN H2O)..... | 1.24 |
| C. | METER PRESSURE (IN. HG.)..... | 29.64 |
| D. | STATIC PRESSURE (IN. H2O)..... | .30 |
| E. | STATIC PRESSURE (IN. HG.)..... | .022 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.57 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2370 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000306 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 581.3 |
| K. | AVG. METER TEMP (DEG. R.)..... | 552.5 |
| L. | CONDENSATE VOL. (ML)..... | 19.9 |
| M. | ABSORBED H2O (ML)..... | 16.6 |
| N. | TOTAL H2O (ML)..... | 36.5 |
| O. | METERED GAS (CF)..... | 78.879 |
| P. | GAS METER CORRECTION..... | 1.0372 |
| Q. | CORRECTED METERED GAS (CF)..... | 81.813 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.816 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 83.630 |
| T. | PERCENT H2O (100R/S)..... | 2.17 |
| | THEORETICAL MAXIMUM..... | 11.99 |
| | PERCENT WATER USED..... | 2.17 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 77.514 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9783 | X | 44.0 | = | .00 |
| CO | .000 | X | .9783 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9783 | X | 32.0 | = | 6.42 |
| N2 | .795 | X | .9783 | X | 28.2 | = | 21.93 |
| H2O | | X | T/100= .0217 | X | 18.0 | = | .39 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.74 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 37.54 |
| | [85.49*W*SQRT{(J*DELTA P)/(V*F)}] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 28306. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 25411. |
| | STACK FLOW RATE (DRY)..... | 24859. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 106.59 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 12
CLR-M12-1 3-13-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00030 | .00000 | .00150 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00340 | .00440 |
| PARTICULATE | .00960 | |
| ALL MATLS. | .00960 | |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00103 | .22013 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE
MODULE 14

DATE: .....3-13-90
CHARGE #: ...150-601000
TEST #: .....CLR-M14-1

1. EMISSION RESULTS

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00181 | .37884 |

---

2. STACK CONDITIONS

| | |
|---|---|
| FLOW (ACFM) | 28008. |
| (SCFM) | 25047. |
| MOISTURE CONTENT (%) | 2.37 |
| STACK TEMPERATURE (F) | 123.7 |

---

3. SAMPLING CONDITIONS

| | |
|---|---|
| SAMPLE TIME (MIN.) | 120.0 |
| SCFD GAS SAMPLED | 54.528 |
| PERCENT ISOKINETIC | 105.97 |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 14
CLR-M14-1 3-13-90

FIELD DATA AND VELOCITY CALCULATIONS

| POINT | TIME | METER READING (DRY) CF | DELTA P IN.H2O | ORIFICE DELTA H REQ | ORIFICE DELTA H ACT | METER TEMP DEG F IN | METER TEMP DEG F OUT | VACUUM IN.HG. | STACK TEMP DEG F | CORRECTED VELOCITY FT/SEC |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.0SW | 955.0 | 367.470 | .250 | .36 | .36 | 77. | 72. | 2.0 | 120. | 29.7 |
| 44.8SW | | | .250 | .36 | .36 | 83. | 73. | 2.0 | 119. | 29.6 |
| 42.3SW | | | .250 | .36 | .36 | 88. | 76. | 2.0 | 119. | 29.6 |
| 39.5SW | | | .280 | .40 | .40 | 91. | 77. | 2.0 | 123. | 31.5 |
| 36.0SW | | | .300 | .43 | .43 | 94. | 80. | 2.0 | 121. | 32.5 |
| 30.9SW | | | .350 | .50 | .50 | 96. | 80. | 3.0 | 122. | 35.2 |
| 17.1SW | | | .600 | .86 | .86 | 99. | 81. | 4.0 | 123. | 46.1 |
| 12.0SW | | | .600 | .88 | .88 | 102. | 82. | 4.0 | 121. | 46.0 |
| 8.5SW | | | .700 | 1.03 | 1.03 | 102. | 84. | 4.0 | 121. | 49.7 |
| 5.7SW | | | .700 | 1.03 | 1.03 | 102. | 84. | 4.0 | 122. | 49.7 |
| 3.2SW | | | .600 | .88 | .88 | 102. | 84. | 3.5 | 123. | 46.1 |
| 1.0SW | 1055.0 | 398.662 | .500 | .73 | .73 | 102. | 85. | 3.0 | 122. | 42.0 |
| 47.0NW | 1125.0 | 398.662 | .300 | .43 | .43 | 82. | 83. | 2.0 | 121. | 32.5 |
| 44.8NW | | | .250 | .36 | .36 | 96. | 83. | 2.0 | 124. | 29.8 |
| 42.3NW | | | .380 | .55 | .55 | 98. | 84. | 2.0 | 131. | 36.9 |
| 39.5NW | | | .350 | .51 | .51 | 100. | 85. | 2.0 | 127. | 35.3 |
| 36.0NW | | | .420 | .61 | .61 | 102. | 86. | 2.5 | 129. | 38.7 |
| 30.9NW | | | .420 | .61 | .61 | 103. | 87. | 2.5 | 131. | 38.8 |
| 17.1NW | | | .400 | .58 | .58 | 104. | 88. | 2.5 | 125. | 37.7 |
| 12.0NW | | | .400 | .58 | .58 | 104. | 89. | 2.5 | 127. | 37.7 |
| 8.5NW | | | .400 | .58 | .58 | 104. | 89. | 2.5 | 127. | 37.7 |
| 5.7NW | | | .430 | .63 | .63 | 104. | 89. | 2.5 | 126. | 39.1 |
| 3.2NW | | | .250 | .37 | .37 | 105. | 90. | 2.0 | 124. | 29.8 |
| 1.0NW | 1225.0 | 426.220 | .250 | .37 | .37 | 105. | 90. | 2.0 | 121. | 29.7 |

O R S A T

| | |
|---|---|
| CO2 | .0 |
| O2 | 20.5 |
| CO | .0 |
| N | 79.5 |

| | | |
|---|---|---|
| IMPINGER NO. | 1 | 9.9 |
| | 2 | 5.6 |
| | 3 | 1.6 |
| | 4 | .0 |
| ABSORBED H2O | | 11.0 |

CONTROL BOX CALIBRATIONS

| | FACTOR | DATE |
|---|---|---|
| ORIFICE | 1.634 | 12-28-89 |
| METER | 0.9778 | 12-28-89 |
| PITOT | 0.84 | 2-26-90 |

LEAK CHECK

| | RATE | IN.HG |
|---|---|---|
| INITIAL | LT 0.02CFM | 5.0 |
| FINAL | 0.005 CFM | 6.0 |

CONTROL BOX NO. 3 PROBE NO. 5-4 NOZZLE NO. 45

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 14
CLR-M14-1 3-13-90

STACK SAMPLING CALCULATIONS

| | | |
|---|---|---|
| A. | BAROMETRIC PRESSURE IN. HG..... | 29.55 |
| B. | AVG. DELTA H (IN H2O)..... | .58 |
| C. | METER PRESSURE (IN. HG.)..... | 29.59 |
| D. | STATIC PRESSURE (IN. H2O)..... | .40 |
| E. | STATIC PRESSURE (IN. HG.)..... | .029 |
| F. | STACK PRESSURE (IN. HG.) (A+E)..... | 29.58 |
| G. | STACK DIAMETER (IN.)..... | 48.00 |
| H. | STACK AREA (SQ. FT.)..... | 12.57 |
| | NOZZLE DIAMETER..... | .2010 |
| I. | NOZZLE AREA (SQ. FT.)..... | .000220 |
| J. | AVG. STACK TEMP (DEG. R.)..... | 583.7 |
| K. | AVG. METER TEMP (DEG. R.)..... | 550.5 |
| L. | CONDENSATE VOL. (ML)..... | 17.1 |
| M. | ABSORBED H2O (ML)..... | 11.0 |
| N. | TOTAL H2O (ML)..... | 28.1 |
| O. | METERED GAS (CF)..... | 58.750 |
| P. | GAS METER CORRECTION..... | .9778 |
| Q. | CORRECTED METERED GAS (CF)..... | 57.446 |
| R. | H2O GAS VOLUME (CF) (0.00267N(K/C)..... | 1.396 |
| S. | TOTAL SAMPLED VOLUME (CF) (Q+R)..... | 58.842 |
| T. | PERCENT H2O (100R/S)..... | 2.37 |
| | THEORETICAL MAXIMUM..... | 13.02 |
| | PERCENT WATER USED..... | 2.37 |
| U. | SCFD GAS SAMPLED (528*Q*C/(29.9*K))..... | 54.528 |

V. MOLECULAR WEIGHT OF STACK GAS

| COMPONENT | ORSAT-DRY VOL.PCT./100 | X | MOISTURE CORRECTION (1-T/100) | X | MOLECULAR WEIGHT | = | WEIGHT PER MOLE |
|---|---|---|---|---|---|---|---|
| CO2 | .000 | X | .9763 | X | 44.0 | = | .00 |
| CO | .000 | X | .9763 | X | 28.0 | = | .00 |
| O2 | .205 | X | .9763 | X | 32.0 | = | 6.40 |
| N2 | .795 | X | .9763 | X | 28.2 | = | 21.89 |
| H2O | | X | T/100= .0237 | X | 18.0 | = | .43 |
| | | | | | MOLECULAR WEIGHT OF STACK GAS | = | 28.72 |

| | | |
|---|---|---|
| W. | PITOT CORRECTION..... | .840 |
| X. | AVERAGE CORRECTED VELOCITY (FPS)..... | 37.15 |
| | [85.49*W*SQRT{(J*DELTA P)/(V*F)}] | |
| Y. | AVG. FLOW RATE (CFM) (X*H*60)..... | 28008. |
| Z. | STACK FLOW RATE (SCFM) (528*Y/J*F/29.92)..... | 25047. |
| | STACK FLOW RATE (DRY)..... | 24453. |
| AA. | SAMPLE TIME (SEC)..... | 7200. |
| BB. | PERCENT ISOKINETIC..... | 105.97 |
| | (J*100*U*29.92)/(528*X*AA*I*F*(1-T/100)) | |

AIR QUALITY ENGINEERING

U.S. STEEL
B BAT. BAGHOUSE MODULE 14
CLR-M14-1 3-13-90

| PARAMETER | CYCLONE WT. (G) | MATL.ON FILTER(G) | INSOL.MATL. IN PROBE(G) | SOL.MATL. IN PROBE(G) |
|---|---|---|---|---|
| PARTICULATE | .00000 | .00160 | .00000 | .00160 |

| PARAMETER | INSOL.MATL. IN IMP.(G) | SOLUBLE MATL. IN IMP.(G) |
|---|---|---|
| PARTICULATE | .00320 | .00730 |
| PARTICULATE | .01370 | |
| ALL MATLS. | .01370 | |

| PARAMETER | GR/SCFD | LB/HR |
|---|---|---|
| PARTICULATE | .00181 | .37884 |

Emission rates are based on the PA method.
The soluble impinger weight is excluded from the calculations

# APPENDIX F

# ANALYTICAL RESULTS FOR SULFATE DETERMINATION

| Sample I.D. | Weight of Residue After Filtration (g) | Weight of Water Blank (g) | Amount of 0.1 N NaOH Needed to Neutralize Sample (mL) | Weight of $Na^+$ (g) | Weight of Residue After Neutralization (g) | Weight of $SO_4^=$ (g) | $SO_4^=$ Emission Rate (mg/dscm) |
|---|---|---|---|---|---|---|---|
| CLR-M1-1 | 0.0067 | 0.0000 | 0.30 | 0.0007 | 0.0060 | 0.0030 | 1.7301 |
| CLR-M3-1 | 0.0018 | 0.0000 | 0.10 | 0.0002 | 0.0022 | 0.0008 | 0.3393 |
| CLR-M4-1 | 0.0115 | 0.0000 | 0.30 | 0.0007 | 0.0106 | 0.0029 | 1.2484 |
| CLR-M5-1 | 0.0157 | 0.0000 | 1.08 | 0.0025 | 0.0143 | 0.0096 | 6.5574 |
| CLR-M6-1 | 0.0011 | 0.0000 | 0.10 | 0.0002 | 0.0018 | 0.0005 | 0.3213 |
| CLR-M7-1 | 0.0010 | 0.0000 | 0.17 | 0.0004 | 0.0020 | 0.0012 | 0.5410 |
| CLR-M8-1 | 0.0028 | 0.0000 | 0.19 | 0.0004 | 0.0033 | 0.0015 | 0.9219 |
| CLR-M9-1 | 0.0022 | 0.0000 | 0.16 | 0.0004 | 0.0034 | 0.0014 | 0.7584 |
| CLR-M10-1 | 0.0011 | 0.0000 | 0.10 | 0.0002 | 0.0018 | 0.0009 | 0.5169 |
| CLR-M11-1 | 0.0055 | 0.0000 | 0.20 | 0.0005 | 0.0049 | 0.0017 | 1.1266 |
| CLR-M12-1 | 0.0013 | 0.0000 | 0.10 | 0.0002 | 0.0019 | 0.0009 | 0.4100 |
| CLR-M14-1 | 0.0050 | 0.0000 | 0.30 | 0.0007 | 0.0047 | 0.0021 | 1.3601 |

Performed in accordance with the Allegheny County Bureau of Air Pollution Control Source Testing Manual, Chapter 6, Item 11.

KEYSTONE
ENVIRONMENTAL RESOURCES, INC

115X Clairton Works - B - Battery

| ate | Test # | SCFD GAS SAMPLED | SCMD GAS SAMPLE |
|---|---|---|---|
| 2-90 | CLR-M8-1 | 57.454 | ~~1.589~~ 1.627 |
| -12-90 | CLR-M8-1 | 65.176 | 1.846 |
| 2-90 | CLR-M10-1 | 61.482 | 1.741 |
| 12-90 | CLR-M11-1 | 53.278 | 1.509 |
| -13-90 | CLR-M1-1 | 61.230 | 1.734 |
| 13-90 | CLR-M3-1 | 83.279 | 2.358 |
| -13-90 | CLR-M4-1 | 82.031 | 2.323 |
| 13-90 | CLR-M5-1 | 51.707 | 1.464 |
| 13-90 | CLR-M6-1 | 54.961 | 1.556 |
| -13-90 | CLR-M7-1 | 78.321 | 2.218 |
| 3-90 | CLR-M12-1 | 77.514 | 2.195 |
| -13-90 | CLR-M14-1 | 54.528 | 1.544 |

$$1\ ft^3 = 0.0283\ m^3$$

$$\frac{1\ ft^3}{1} \times \frac{(12\ in)^3}{1\ ft^3} \times \frac{(2.54\ cm)^3}{(1\ in)^3} \times \frac{1\ m^3}{(100\ cm)^3} = 0.028316847$$

$$\doteq 0.0283$$

# APPENDIX G

# FIELD DATA SHEETS FOR VISIBLE EMISSIONS AND PLUME OPACITY MEASUREMENTS

USX CORPORATION USS CLAIRTON WORKS

EMISSION CONTROL REPORT - "B" BATTERY SHED OBSERVATIONS

BATTERY B

| DATE | Oven Observ. | Sec. >=20% | Max. Opacity | Pushing Performance |
|---|---|---|---|---|
| 03/12/90 | B-14 | 0 | 0% | 100% |
| 03/12/90 | A-19 | 0 | 0% | 100% |
| 03/12/90 | B-24 | 0 | 0% | 100% |
| 03/12/90 | A-29 | 0 | 0% | 100% |
| 03/12/90 | B-29 | 0 | 0% | 100% |
| 03/12/90 | A-34 | 0 | 0% | 100% |
| 03/12/90 | B-34 | 0 | 0% | 100% |
| 03/12/90 | A-1 | 5 | 25% | 0% |
| 03/12/90 | B-1 | 0 | 0% | 100% |
| 03/12/90 | A-6 | 0 | 0% | 100% |
| 03/12/90 | B-6 | 0 | 0% | 100% |
| 03/13/90 | A-11 | 0 | 0% | 100% |
| 03/13/90 | B-11 | 0 | 0% | 100% |
| 03/13/90 | A-16 | 0 | 0% | 100% |
| 03/13/90 | B-16 | 0 | 0% | 100% |
| 03/13/90 | A-21 | 0 | 0% | 100% |
| 03/13/90 | B-21 | 6 | 25% | 0% |
| 03/13/90 | A-26 | 0 | 0% | 100% |
| 03/13/90 | B-26 | 25 | 25% | 0% |
| 03/13/90 | A-31 | 0 | 0% | 100% |
| 03/13/90 | B-31 | 0 | 0% | 100% |
| 03/13/90 | A-36 | 0 | 0% | 100% |
| 03/13/90 | B-36 | 15 | 25% | 0% |
| 03/13/90 | A-23 | 0 | 0% | 100% |
| 03/13/90 | B-23 | 15 | 25% | 0% |
| 03/13/90 | A-28 | 0 | 0% | 100% |
| 03/13/90 | B-28 | 10 | 30% | 0% |
| 03/13/90 | A-33 | 0 | 0% | 100% |
| 03/13/90 | B-33 | 0 | 0% | 100% |
| 03/13/90 | A-38 | 0 | 0% | 100% |
| 03/13/90 | B-5 | 0 | 0% | 100% |
| 03/13/90 | A-5 | 0 | 0% | 100% |
| Total: | 32 | 76 | | 81.25% |
| Average: | | 2.38 | | |

"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-14 | 12:40 | :00 | 0% | No VISIBLE EMISSIONS FROM PUSH |
| | | | | |
| | | | | |
| | | | | |
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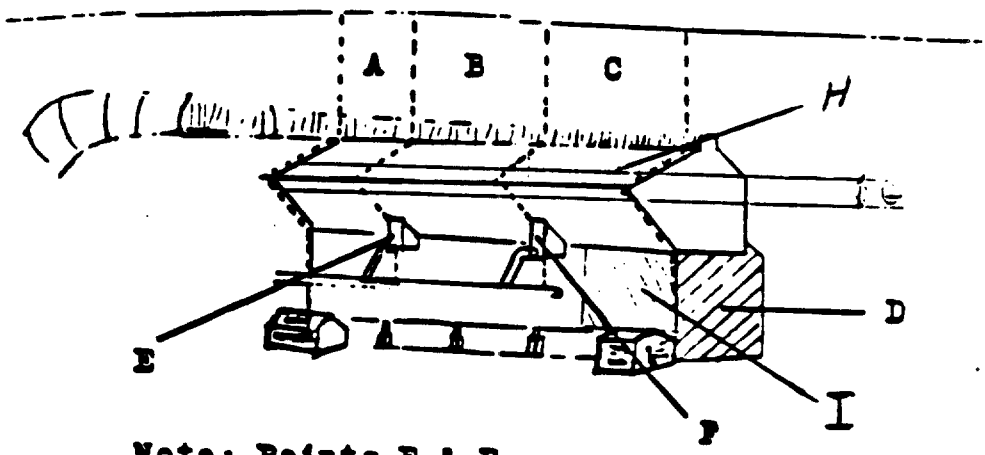
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM S.W. APPROX 10-20 MPH. |

Points of Emission




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte-
During Push and Travel.

"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-19 | 1:01 | 100 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
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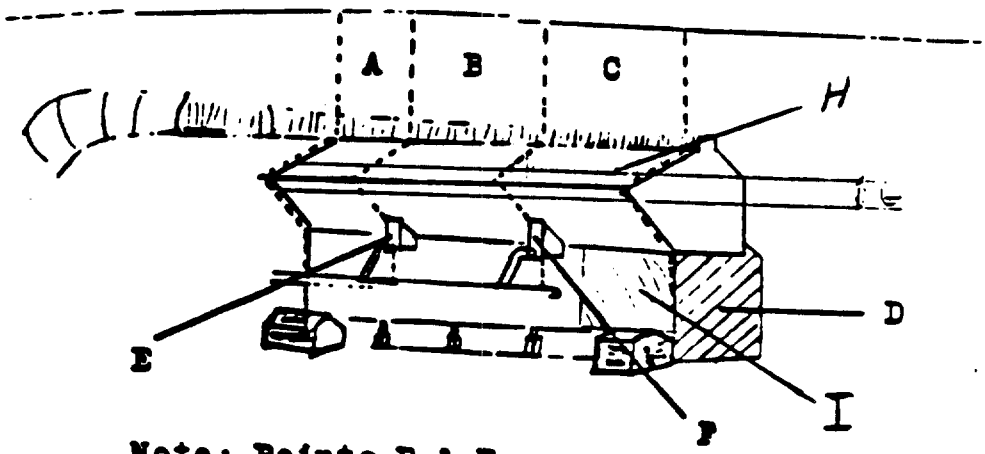
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE SW. APPROX 15 MPH |

Points of Emission




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-24 | 1:47 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
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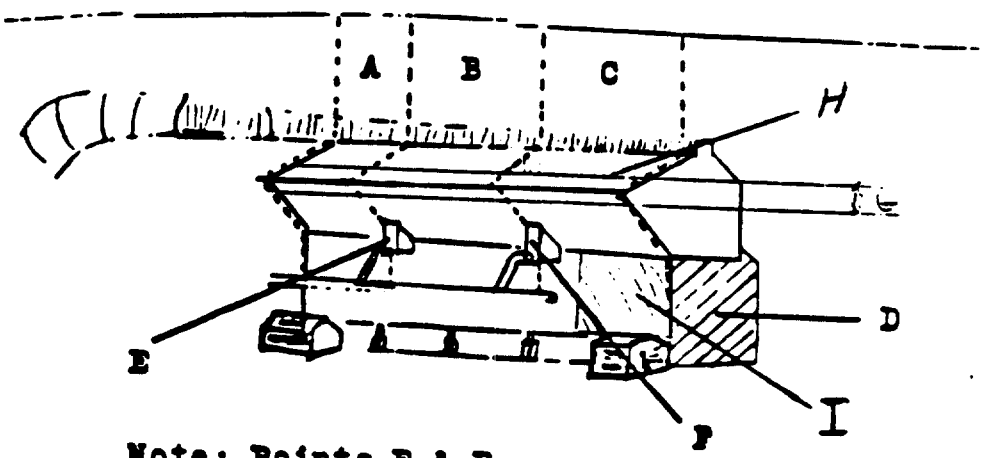
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM S.W. APPROX 15 MPH. |

Points of Emission




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

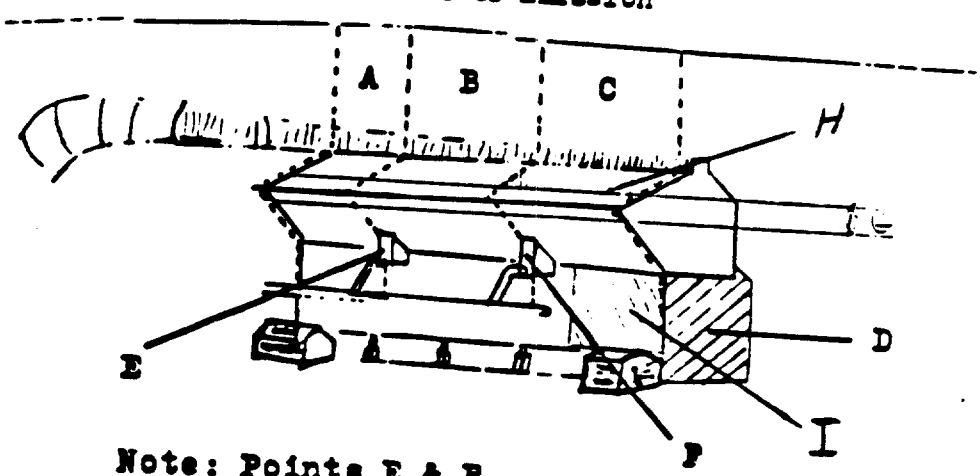
Name: RICK CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-29 | 2:08 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM S.W. APPROX 15 MPH. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-34 | 2:27 | 100 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
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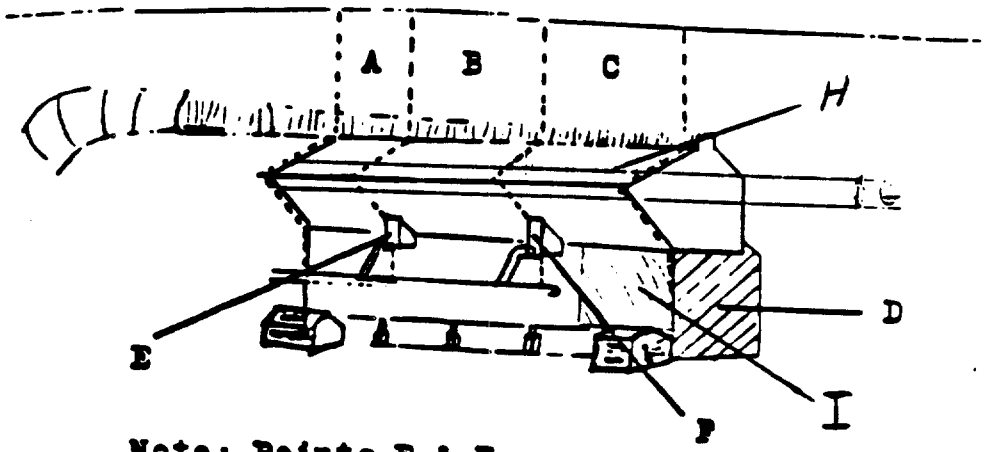
| | | | | |
| | | | | |
| | | | | WINDS FROM SW. AT APPROX 20 MPH. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

"B" Battery Pushing

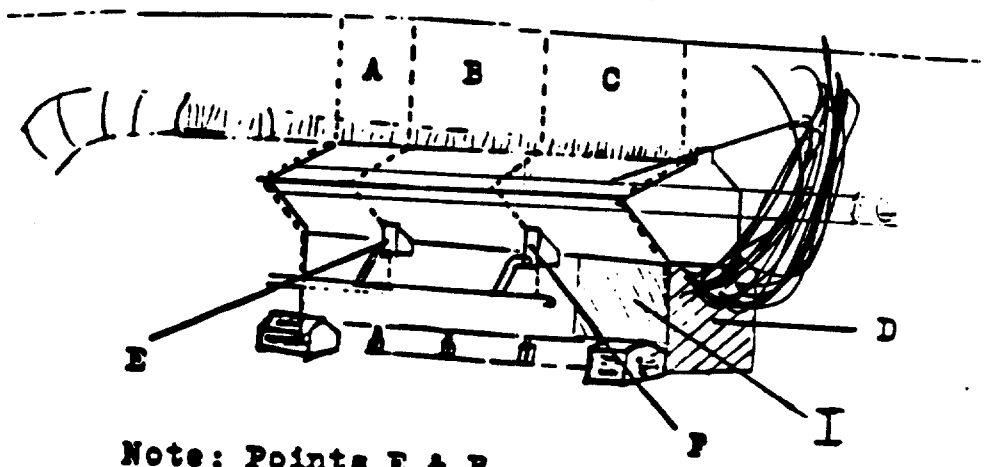
Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. | ≥ 20% Opac. | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-1 | 2:50 | :05 | 25% | ALL EMISSIONS WERE FROM THE SOUTH END OF |
| | | | | THE SHED, AREA "D" |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM S.W. AT APPROX 20mph |

Points of Emission




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/12/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-6 | 3:18 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH |
| | | | | |
| | | | | |
| | | | | |
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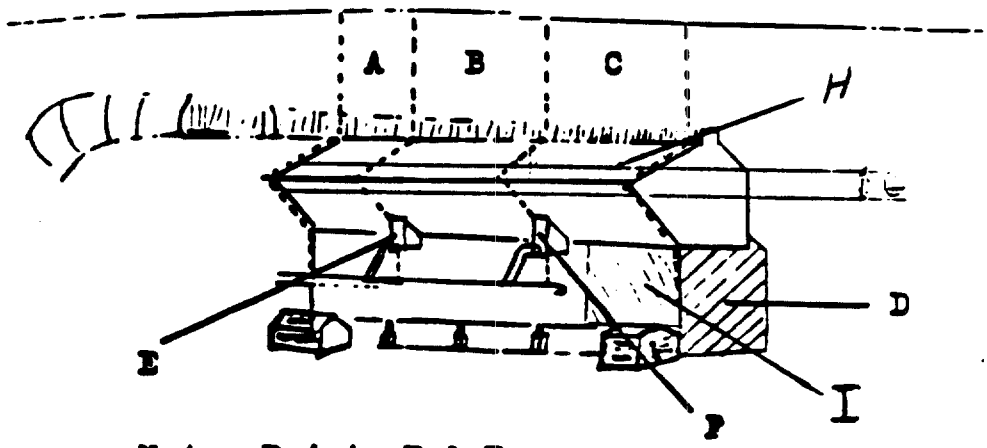
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX 20 MPH. |

Points of Emission




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

COUNTY – HUGHES

Name: RICH CASSELBERRY

Date: 03/13/80

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-16 | 10:32 | 100 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
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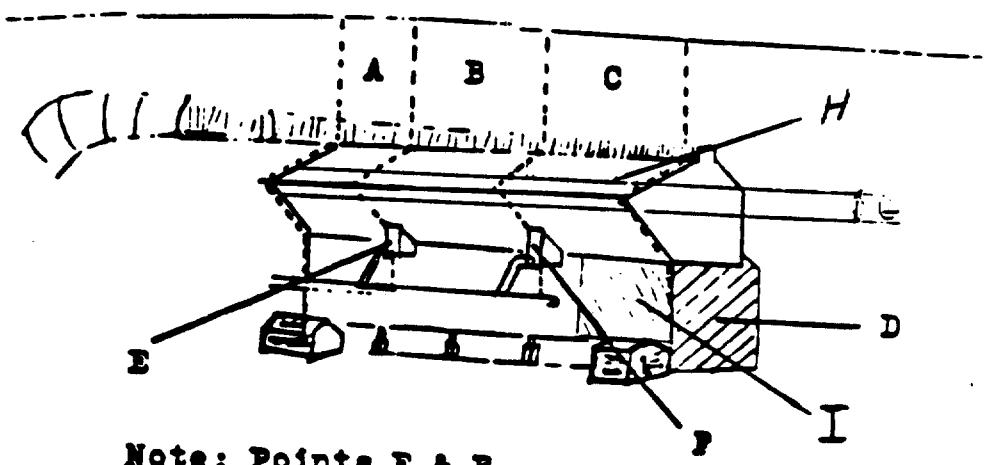
| | | | | |
| | | | | |
| | | | | WINDS FROM S.W. AT APPROX 15 MPH. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

COUNTY - HUGHES

"B" Battery Pushing

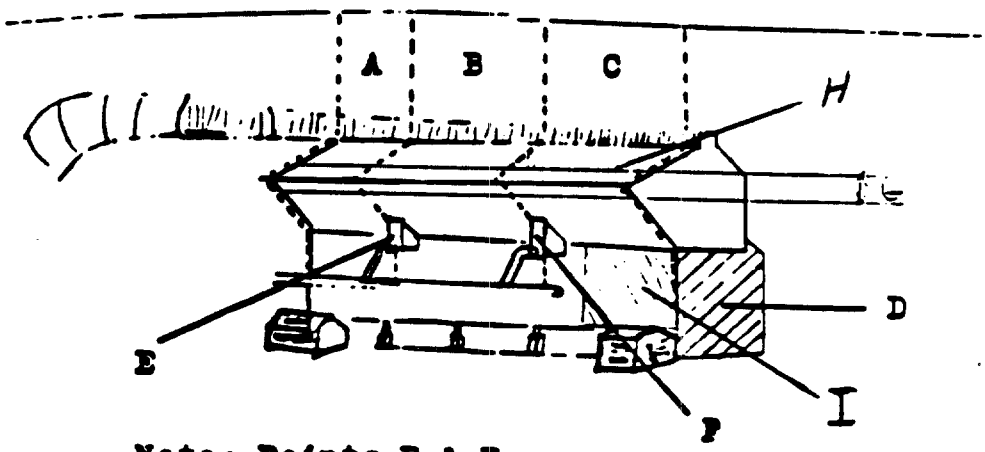
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-16 | 10.43 | 100 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE S.W. AT APPROX 10 mph. |

Points of Emission




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

COUNTY HUGHES

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-21 | 10:54 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
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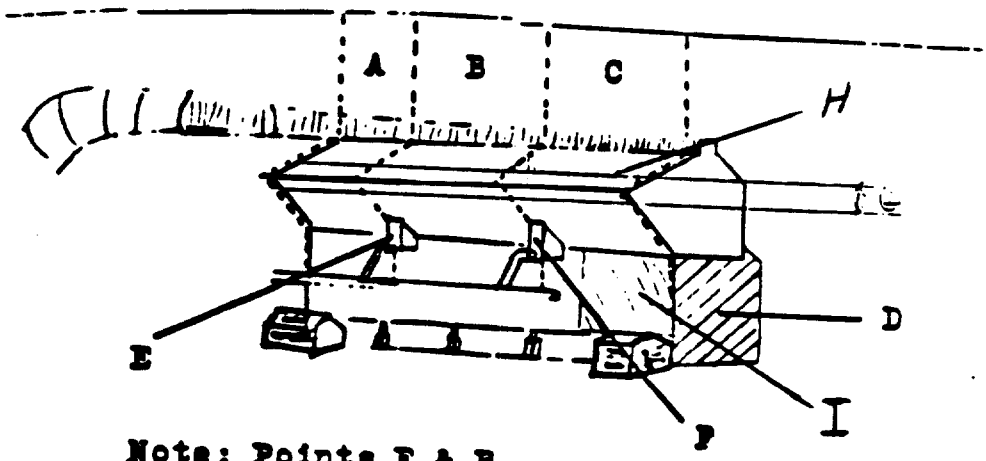
| | | | | |
| | | | | |
| | | | | WINDS FROM S.W. APPROX. 15 MPH. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

COUNTY - HUGHES

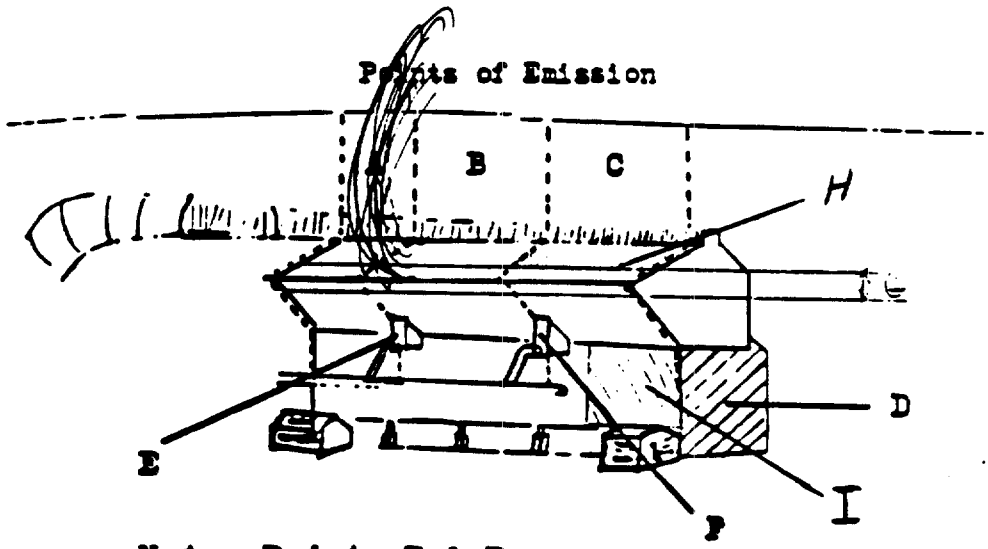
"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-21 | 11:07 | 10.6 | 25% | ALL EMISSIONS FROM ROOF OF SHED AREA "A" |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX 15 mph |




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

COUNTY - HUGHES

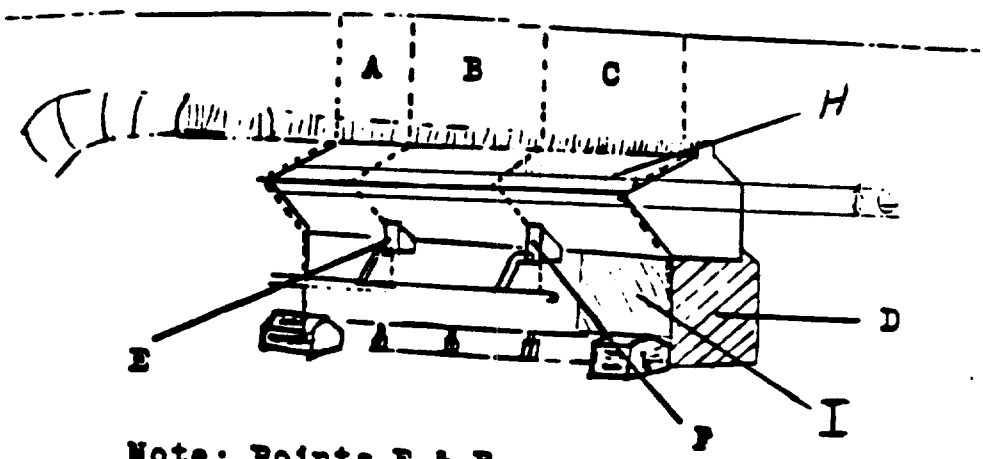
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-26 | 11:22 | :00 | 0% | NO VISIBLE EMISSION OVER 20% FROM PUSH |
| | | | | 00 SECONDS OF 15% FROM AREA "B" |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX 15 MPH. |

Points of Emission




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

COUNTY - HUGHES

"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-26 | 11:33 | :25 | 25% | ALL EMISSIONS WERE FROM ROOF AREA "A" |
| | | | | |
| | | | | |
| | | | | |
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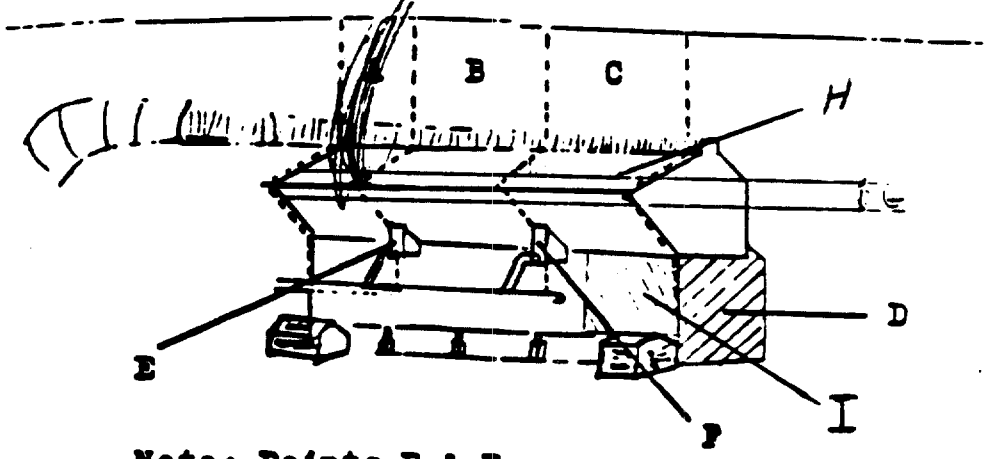
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX 15MPH. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

"B" Battery Pushing

COUNTY - HUGHES

Name: RICH CASSELBERRY

Date: 03/13/10

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-31 | 11:44 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH |
| | | | | |
| | | | | |
| | | | | |
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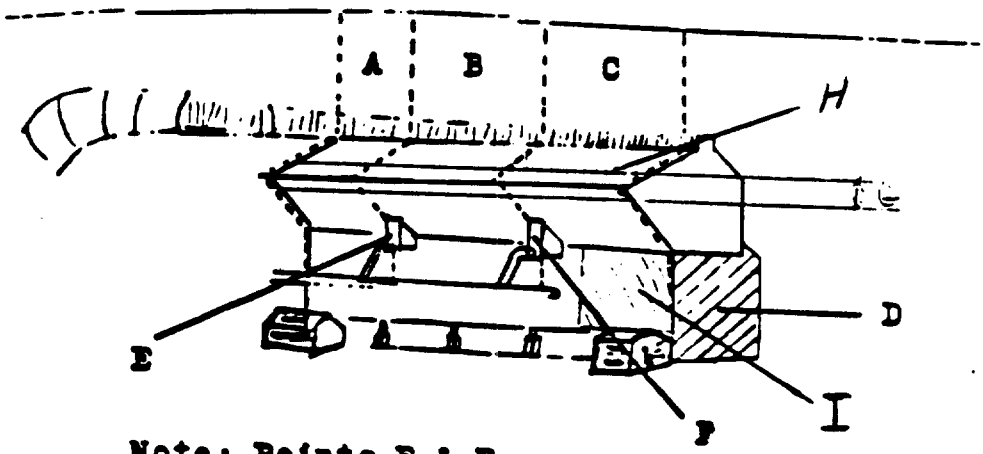
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX. 15 MPH. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

"B" Battery Pushing

COUNTY HUGHES

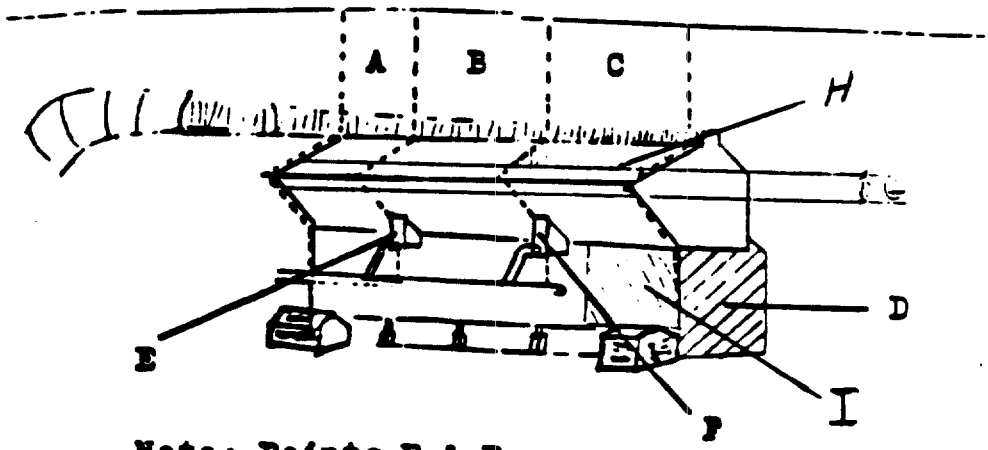
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-31 | 1156 | :00 | 0% | NO VISIBLE EMISSIONS OVER 20%, |
| | | | | :06 SECONDS OF 15% FROM AREA "A" |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX 20 MPH |

Points of Emission




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

COUNTY – HUGHES

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-36 | 1215 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
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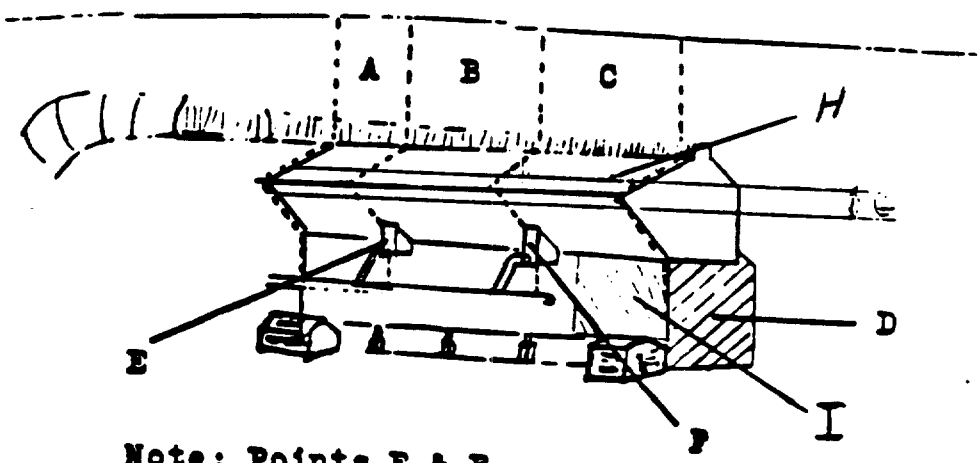
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX 15 MPH. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

COUNTY – Hughes

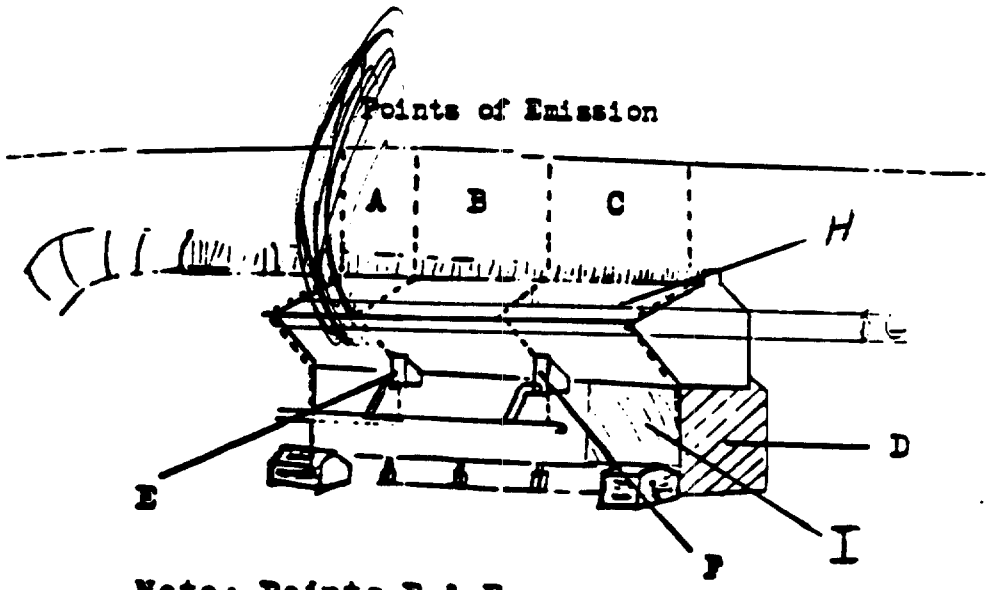
"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-36 | 12:27 | :15 | 25% | ALL EMISSIONS FROM ROOF AREA "A" |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE S.W AT APPROX 15 M.P.H. |




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte-
During Push and Travel.

"B" Battery Pushing

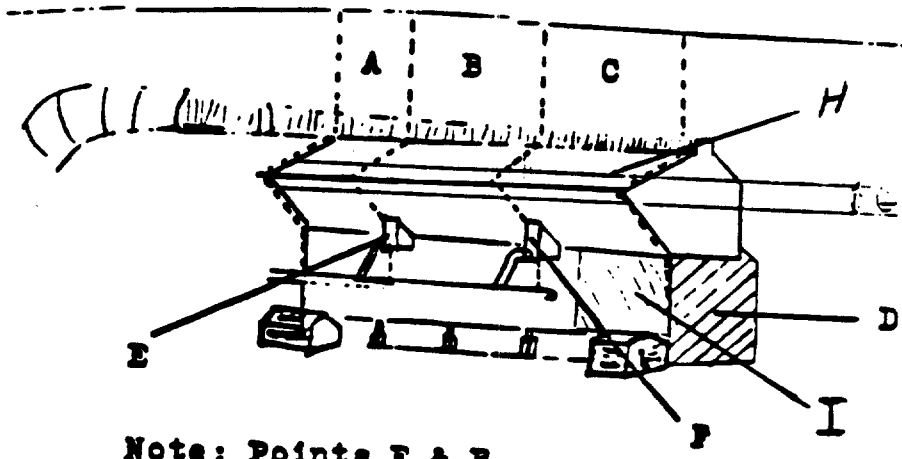
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-23 | 2:25 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX. 10 MPH |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

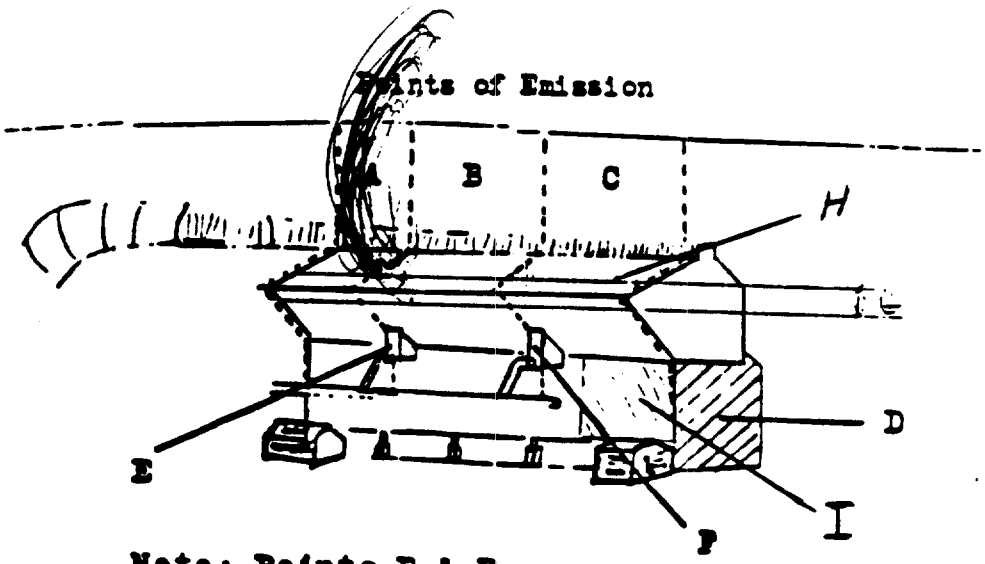
"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-23 | 2:44 | :15 | 25% | ALL EMISSIONS WERE FROM ROOF AREA "A" |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT 10 MPH. |




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte
During Push and Travel.

"B" Battery Pushing

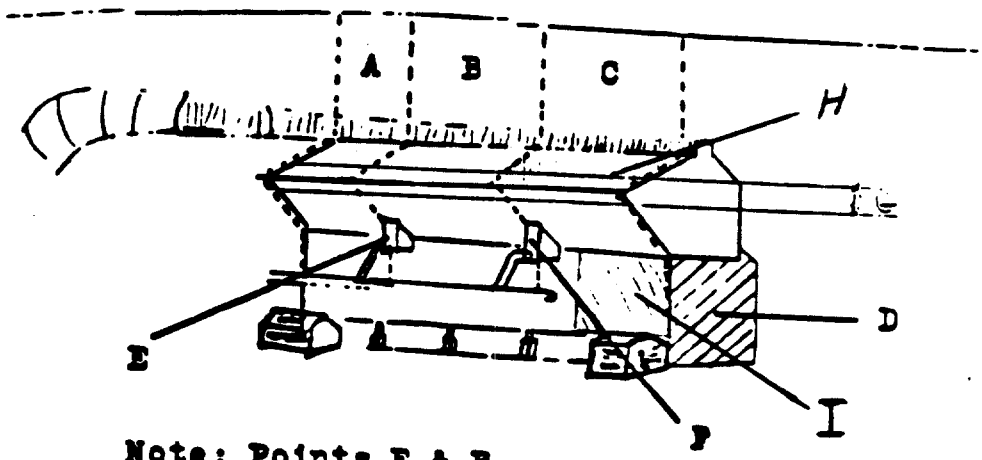
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HAL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-28 | 303 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT 10 mph |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

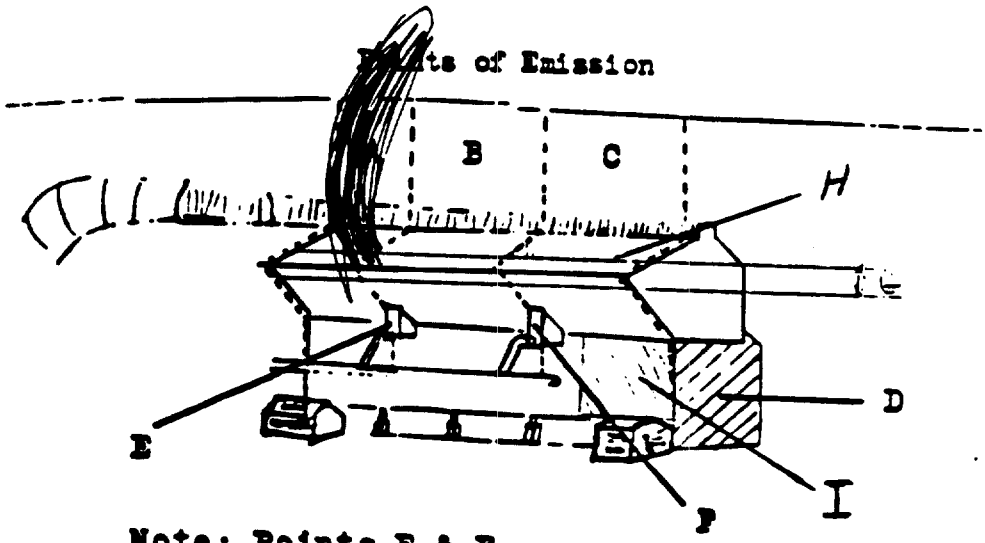
"B" Battery Pushing

Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. | ≥ 20% Opac. | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-28 | 3:16 | 10 | 30% | ALL EMISSION FROM ROOF AREA "A" |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT 10 MPH. |




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte-
During Push and Travel.

"B" Battery Pushing

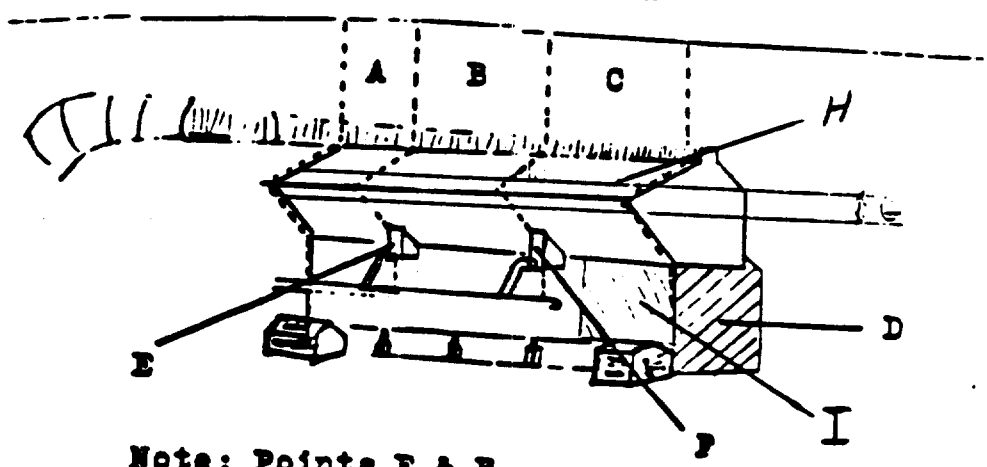
Name: RICH CASSEBURGER

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-33 | 3:37 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WIND FROM THE WEST AT APPROX. 10 M.P.H. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

"B" Battery Pushing

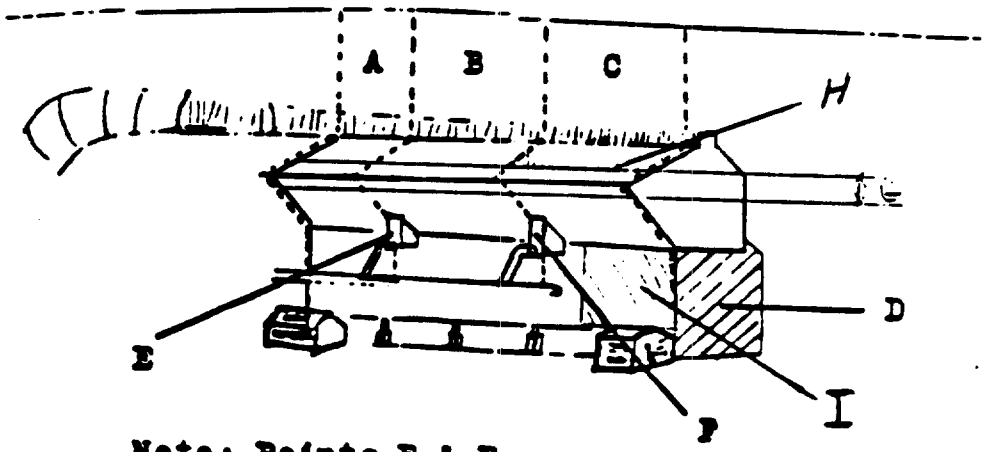
Name: RICH CASSLASBY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-33 | 4:08 | :00 | 0% | NO EMISSIONS READINGS OF 20% |
| | | | | :12 SECONDS OF 10% |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX. 10 MPH |

Points of Emission




Note: Points E & F
Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte-
During Push and Travel.

"B" Battery Pushing

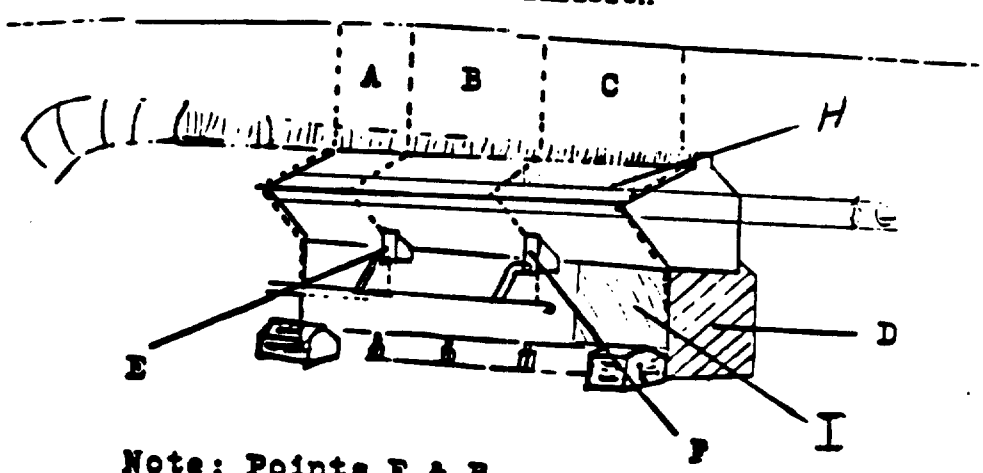
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-38 | 4.20 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX 10 MPH. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

"B" Battery Pushing

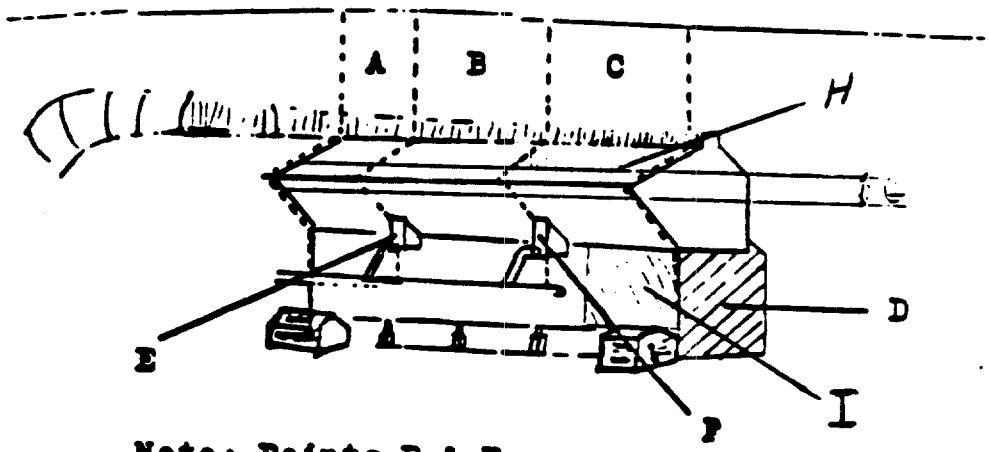
Name: RICH CASSELBERRY

Date: 03/13/90

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| B-5 | 4:31 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS FROM THE WEST AT APPROX 10 MPH. |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

"B" Battery Pushing

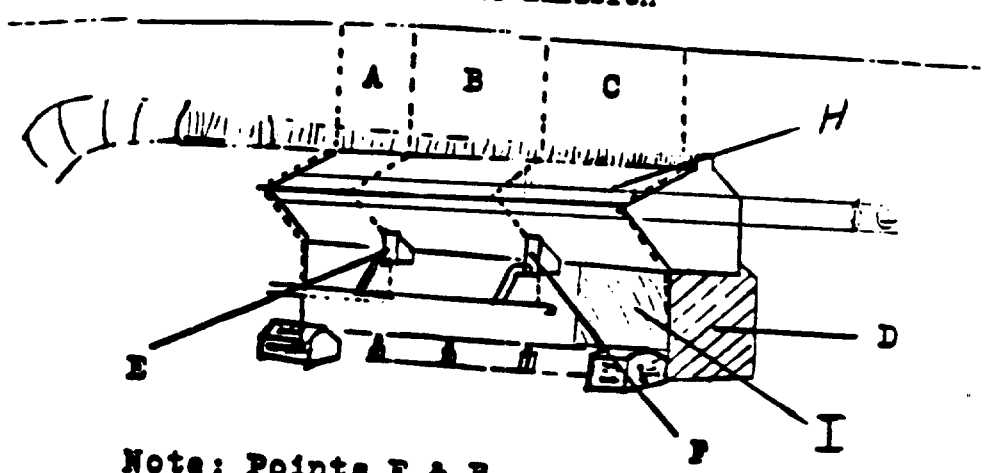
Name: RICH CASSELBERRY

Date: 03/13/00

Foreman: HALL Crew: B

| OVEN | TIME | 1. PUSH Seconds Max. ≥ 20% Opac. | | Areas of Emission &/or Comments |
|---|---|---|---|---|
| A-5 | 4:43 | :00 | 0% | NO VISIBLE EMISSIONS FROM PUSH. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | WINDS ARE FROM THE WEST AT APPROX. 10 MPH |

Points of Emission




Note: Points E & F Designate Doorways

Note: #I. Represents fugitive emissions from the Coke Side Shed on "B" Batte During Push and Travel.

(1)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B"-BATTERY - BAG HSE

OBSERVER: K. KUIROS

DATE: 3/12/90

FACILITY: US K-CLAIRTON

OBSERVATION: START TIME: 11 35 A

END TIME: 12 35 P

OBSERVATION POINT:

South of #3 Feeder RM OFF Roadway

SOURCE: Bag House

DISTANCE: 150'

DIRECTION FROM: S/E

HEIGHT: 75'

WIND:

SPEED: 25 MPH

DIRECTION: S/W

TEMPERATURE: 71

SKY CONDITION: PT. Cloudy

BACKGROUND: Pipe + Sky

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: Lost Power AT 11 36 A - Restored AT 12 40 P

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 25 | 0 | 0 | 0 | 0 | 0 | 55 | 30 | 0 | 0 | 0 | 0 |
| | 1 | 0 | 0 | 0 | 0 | | 31 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | | 32 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | | 33 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | | 34 | 0 | 0 | 0 | 0 |
| 30 | 5 | 0 | 0 | 0 | 0 | 12N | 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 |
| 35 | 10 | 0 | 0 | 0 | 0 | 5 | 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 |
| 40 | 15 | 0 | 0 | 0 | 0 | 10 | 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 |
| 45 | 20 | 0 | 0 | 0 | 0 | 15 | 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 |
| 50 | 25 | 0 | 0 | 0 | 0 | 20 | 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 |

(2)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" - BATTERY BAG-HSE

OBSERVER: K. Kuikos

DATE: 3/12/90

FACILITY: USX-CLAIRTON

OBSERVATION: START TIME: 12 25 P

END TIME: 1 25 P

OBSERVATION POINT:

South of #3 Feeder Room off Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/E

HEIGHT: 75'

WIND:

SPEED: 25 MPH

DIRECTION: S/W

TEMPERATURE: 72

SKY CONDITION: Pt. Cloudy

BACKGROUND: Pipe + Sky

READING CONDITIONS: Good Air

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: Resumed at 12 40 P from Page (1)

Lost Power at 1 PM again - Resumed at 1 40 P

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 120 | 0 | 0 | 0 | 0 | 0 | 55 | 30 | 0 | 0 | 0 | 0 |
| | 1 | 0 | 0 | 0 | 0 | | 31 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | | 32 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | | 33 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | | 34 | 0 | 0 | 0 | 0 |
| 30 | 5 | 0 | 0 | 0 | 0 | 1 10 | 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 |
| 35 | 10 | 0 | 0 | 0 | 0 | 5 | 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 |
| ✓ 40 | 15 | 0 | 0 | 0 | 0 | 10 | 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 |
| 45 | 20 | 0 | 0 | 0 | 0 | 15 | 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 |
| 50 | 25 | 0 | 0 | 0 | 0 | 20 | 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 |

(5)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" BATTERY BAG-HOUSE

OBSERVER: GRUMMAN ~~K. KUTTOS~~

DATE: 3/12/90

FACILITY: USX-CLAIRTON

OBSERVATION: START TIME: 3:25 0

END TIME: _____

OBSERVATION POINT: South of #3 Feeder Room off Roadside

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/E

HEIGHT: 75'

WIND:

SPEED: 21 MPH

DIRECTION: W

TEMPERATURE: 76°

SKY CONDITION: Pt. Cloudy

BACKGROUND: Blue Sky

READING CONDITIONS: FAIR

COLOR OF EMISSION: _____

TOTAL No. OF READINGS: 104

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: _____

COMMENTS: _____

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

①

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" - BATTERY Bag-Hse

OBSERVER: K. Kuiros

DATE: 3/13/90

FACILITY: USX-Clairton

OBSERVATION: START TIME: 9 55 A

END TIME: 10 55 A

OBSERVATION POINT:

South of #3 Feeder Room
Alongside Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/W

HEIGHT: 75'

WIND:

SPEED: 14 MPH

DIRECTION: S/W

TEMPERATURE: 67°

SKY CONDITION: Pt. Cloudy

BACKGROUND: Pipe + Sky

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

| | | | | | |
|---|---|---|---|---|---|
| 9 55 | 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 |
| 10 00 | 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 |
| 5 | 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 |
| 10 | 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 |
| 15 | 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 |
| 20 | 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 |

| | | | | | |
|---|---|---|---|---|---|
| 25 | 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 |
| 30 | 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 |
| 35 | 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 |
| 40 | 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 |
| 45 | 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 |
| 50 | 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 |

(2)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" - BATTERY - BAG-HSE

DBSERVER: K. KULROS

DATE: 3/13/90

FACILITY: USX-CLAIRTON

OBSERVATION: START TIME: 10:55 A

END TIME: 11:55 A

OBSERVATION POINT:

South of #2 Feeder Room

Alongside Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/W

HEIGHT: 75'

WIND:

SPEED: 16 MPH

DIRECTION: W

TEMPERATURE: 68°

SKY CONDITION: PT Cloudy

BACKGROUND: Pipe + Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10:55 A | 0 | 0 | 0 | 0 | 0 | 25 | 30 | 0 | 0 | 0 | 0 |
| | 1 | 0 | 0 | 0 | 0 | | 31 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | | 32 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | | 33 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | | 34 | 0 | 0 | 0 | 0 |
| 11:00 A | 5 | 0 | 0 | 0 | 0 | 30 | 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 |
| 5 | 10 | 0 | 0 | 0 | 0 | 35 | 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 |
| 10 | 15 | 0 | 0 | 0 | 0 | 40 | 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 |
| 15 | 20 | 0 | 0 | 0 | 0 | 45 | 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 |
| 20 | 25 | 0 | 0 | 0 | 0 | 50 | 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 |

(3)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B" - Battery - Bag-House

OBSERVER: K. Kulacs

DATE: 3/13/90

FACILITY: USX - Clairton

OBSERVATION: START TIME: 11:55 A

END TIME: 12:28 P

OBSERVATION POINT:
South of #3 Feeder Room
Alongside Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/W

HEIGHT: 75'

WIND:

SPEED: 12 MPH

DIRECTION: S/W

TEMPERATURE: 72°

SKY CONDITION: Pt. Cloudy

BACKGROUND: Pile + Sky

READING CONDITIONS: Fair

COLOR OF EMISSION:

TOTAL No. OF READINGS: 136

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS:

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

(4)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B"-BATTERY-BAG-HSE

OBSERVER: K. Kuiros + Grumling

DATE: 3/13/90

FACILITY: USX-Clairton

OBSERVATION: START TIME: 2 22 P

END TIME: 3 22 P

OBSERVATION POINT: South of #3 Feeder Room Alongside Roadway

SOURCE: Bag-House

DISTANCE: 150'

DIRECTION FROM: S/W

HEIGHT: 75'

WIND:

SPEED: 10 MPH

DIRECTION: W

TEMPERATURE: 75

SKY CONDITION: PT Cloudy

BACKGROUND: Piped Sky

READING CONDITIONS: Good

COLOR OF EMISSION: \

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 22 P | 0 | 0 | 0 | 0 | 0 | | 30 | 0 | 0 | 0 | 0 |
| | 1 | 0 | 0 | 0 | 0 | | 31 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | | 32 | 0 | 0 | 0 | 0 |
| 25 | 3 | 0 | 0 | 0 | 0 | 55 | 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 |
| 30 | 8 | 0 | 0 | 0 | 0 | 3 P | 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 |
| 35 | 13 | 0 | 0 | 0 | 0 | 5 | 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 |
| 40 | 18 | 0 | 0 | 0 | 0 | 10 | 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 | 15 | 52 | 0 | 0 | 0 | 0 |
| 45 | 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 |
| 50 | 28 | 0 | 0 | 0 | 0 | 20 | 58 | 0 | 0 | 0 | 0 |
| | 29 | 0 | 0 | 0 | 0 | | 59 | 0 | 0 | 0 | 0 |

GRUMLING STARTS HERE

(5)

VISIBLE EMISSIONS OBSERVATIONS FORM

"B - BATTERY BAG HOUSE

OBSERVER: GRUMLING

DATE: 3-13-90

FACILITY: USX CLAINTON

OBSERVATION: START TIME: 3 23

END TIME: 4 23

OBSERVATION POINT:

SOUTH OF #3 FEEDER ROOM ALONG SIDE ROADWAY

SOURCE:

DISTANCE: 150'

DIRECTION FROM: S.W

HEIGHT: 75'

WIND:

SPEED: 7 MPH

DIRECTION: WEST

TEMPERATURE: 76°

SKY CONDITION: PARTLY CLOUDY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | | 30 | 0 | 0 | 0 | 0 |
| | 1 | 0 | 0 | 0 | 0 | | 31 | 0 | 0 | 0 | 0 |
| 3 25 | 2 | 0 | 0 | 0 | 0 | | 32 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | 55 | 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 |
| 30 | 8 | 0 | 0 | 0 | 0 | 4 00 | 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 |
| 35 | 13 | 0 | 0 | 0 | 0 | 4 05 | 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 |
| 40 | 18 | 0 | 0 | 0 | 0 | 10 | 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 |
| 45 | 23 | 0 | 0 | 0 | 0 | 15 | 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 |
| 50 | 28 | 0 | 0 | 0 | 0 | 20 | 58 | 0 | 0 | 0 | 0 |
| | 29 | 0 | 0 | 0 | 0 | | 59 | 0 | 0 | 0 | 0 |

(6)

# VISIBLE EMISSIONS OBSERVATIONS FORM

"B" BATTERY BAG HOUSE

OBSERVER: GRUMLING

DATE: 3-13-90

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 4[illegible]

END TIME: 44[illegible]

OBSERVATION POINT:

SOUTH OF #3 FEEDER ROOM ALONG SIDE ROADWAY

SOURCE:

DISTANCE: 150'

DIRECTION FROM: S.W

HEIGHT: 75'

WIND:

SPEED: 9 MPH

DIRECTION: WEST

TEMPERATURE: 76

SKY CONDITION: PARTLY CLOUDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 92

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 0

CREW: ____ FOREMAN: ____

COMMENTS: ____

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