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
CLAIRTON, PENNSYLVANIA

Report on

COMPLIANCE DEMONSTRATION
B BATTERY BAGHOUSE
USS CLAIRTON WORKS

DECEMBER 1993

Prepared By: Chester Environmental
3000 Tech Center Drive
Monroeville, Pennsylvania 15146

Project No.: 300195-01

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~~G. J. GOETZ~~
1/6/94

~~AHF~~:
Please schedule mtg with me after Engineering has reviewed this report
CJ

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

WGG/WUC → Note

DEC 30 1993

December 22, 1993

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Department of Environmental Resources
P.O. Box 2063
Harrisburg, PA 17120

Deputy Director
Allegheny County Health Department
Department of Air Quality
301 Thirty-ninth Street
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Philadelphia, P[illegible]

No Travel VE observations?
Check Mail also

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

Gentlemen:

Subject: Compliance Demonstration
"B" Battery Pushing Emission Control System

I have enclosed with this letter the mass emission report on "B" Battery Pushing Emission Control System. The compliance demonstration was conducted at USS Clairton Works, Clairton, PA, a division of USX Corporation, on November 17 and 18, 1992, August 24, 1993, and October 6, 1993.

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

Very truly yours,

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

GTW/BAC
Enclosure

Steel the recycled material

EXECUTIVE SUMMARY

A demonstration of the pushing emissions control system for B Battery operated at USS Clairton Works was conducted on November 17 and 18, 1992, August 24, 1993, and October 6, 1993. A containment shed controls the emissions which result from the pushing operations from the B Battery ovens. Emissions from the containment shed are filtered through a baghouse before exhausting to the atmosphere. The purpose of the test program was to determine (1) the particulate matter emissions rate in the exhaust of the baghouse, (2) the opacity of the plumes of the baghouse exhaust, and (3) the opacity of the plume from the containment shed which resulted from the pushing of the coke. Emissions testing was conducted during normal battery operations.

The results of the testing showed an average particulate matter emissions rate of 4.48 pounds per hour, while the allowable emissions rate is 4.49 pounds per hour. No visible emissions were observed from any of the baghouse stacks during the test program. During the test program, the opacity of the plume from the containment shed was greater than or equal to 20 percent twice on November 18, 1992 and six times on August 24, 1993.

1.0 INTRODUCTION

As required by Paragraph V.A.(5)(f) of the amended Mon Valley Consent Decree, a demonstration of the pushing emissions control system for B Battery operated at USS Clairton Works, Clairton, Pennsylvania, was conducted on November 17 and 18, 1992, August 24, 1993, and October 6, 1993. A containment shed controls the emissions which result from the pushing operations from the B Battery ovens. Emissions from the containment shed are filtered through a baghouse before exhausting to the atmosphere. The purpose of the test program was to determine (1) the particulate matter emissions rate in the exhaust of the baghouse, (2) the opacity of the plumes of the baghouse exhaust, and (3) the opacity of the plume from the containment shed which resulted from the pushing of the coke. Emissions testing was conducted during periods of normal battery operations.

The field work activities were completed by Chester Environmental. All test procedures were witnessed by Phil Lawrence from the Allegheny County Health Department - Department of Air Quality (DAQ).

2.0 METHODOLOGIES

A test protocol was prepared by Chester Environmental and submitted to DAQ prior to the execution of the test program. A copy of the test protocol can be found in Appendix A. Specific methodologies employed in the test program are described below.

The baghouse includes fourteen 48-inch diameter exhaust stacks. Emissions are exhausted through twelve of the fourteen stacks at any particular time. In accordance with EPA Method 5D (40 CFR 60 Appendix A) and Chapter 20 of the DAQ Source Testing Manual, the emissions from the twelve exhausting stacks were sampled. Initially, one two-hour test was completed on each of the twelve operational stacks in November 1992, with eight stack tests completed on November 17, 1992, and four stack tests completed on November 18, 1992.

The traverse for each stack included 24 traverse points as calculated from EPA Method 1. Sampling was conducted on each stack through two sampling ports which were separated by 90 degrees in the same horizontal plane.

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

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

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

Particulate matter sampling was performed in accordance with EPA Method 5D, Chapter 20 of the DAQ Source Testing Manual, and Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual (Revision

Number 1, January 1983). Each two hour stack test was designed to sample a minimum of 50 dry standard cubic feet of exhaust gas.

Clean up of the sampling train included separate water and acetone rinses 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; that is, the water rinse was not filtered to determine soluble and insoluble fractions. Front-half acetone and water rinses were evaporated to dryness, desiccated, and weighed to a constant weight. The water soluble and water insoluble portions of the back-half were determined separately in accordance with Section 139.12 of the PA DER Source Testing Manual. The back-half water rinses and first three impinger solutions were combined and then filtered under suction through a preweighed 0.22 micrometer membrane filter. The filter used to capture the insoluble material was dried, desiccated, and weighed to a constant weight. The filtrate, or remaining water from the extraction process, was then evaporated to dryness, desiccated, and weighed to a constant weight. Back-half acetone rinses were evaporated to dryness, desiccated, and weighed to a constant weight. Sample train filters were desiccated for 24 hours, and particulate matter weight was determined gravimetrically. Rinse residue weights and filter weights were measured to the nearest 0.1 mg. One acetone blank and one deionized distilled water blank was prepared in the same manner as the test sample rinses. The blank residue weights were subtracted from the test sample residue weights. After blank correction, front-half water and acetone rinse residue weights, sample train filter weights, and back-half water insoluble filter weights were used to determine total particulate matter catch.

All plume opacity determinations were performed in accordance with EPA Method 9 and Section F of Chapter 18 of the DAQ Source Testing Manual. At the onset of a push from an oven in B Battery, the following data were determined and recorded: (1) the area of any emissions from the containment shed, (2) the maximum plume opacity, (3) the length of time (in seconds) when the plume opacity was greater than or equal to 20 percent. Visible emissions from the baghouse stacks were recorded continuously during the test program.

3.0 RESULTS

All testing was performed during periods of normal plant operation. The results from the testing completed in November 1992 have been summarized in Table 1. The total particulate matter emissions rate was obtained by summing the emissions rate from each stack. The total particulate matter emissions rate was 5.00 pounds per hour (lb/hr).

The allowable particulate matter emissions rate is equal to 0.040 lb per ton of coke pushed (Lowest Allowable Emissions Rate - LAER - Standard). This standard can be converted to a mass emissions rate in units lb/hr by knowing the number of tons of coke per push and the average pushing rate. For B Battery, there are 25.1 tons of coke per push. On November 17 and 18, 1992, the average pushing rate was 4.43 pushes per hour. Therefore, the allowable particulate matter emissions rate is equal to (0.040 lb / ton coke pushed) x (25.1 tons coke pushed / oven) x (4.43 ovens pushed / hour), or 4.45 lb/hr. The average particulate matter emissions rate determined in November 1992 was greater than the allowable emissions rate.

These results were presented to DAQ by USS and Chester in March 1993. Following their review, DAQ noted that the emission rates from Modules 4 and 7 were high in comparison with the emission rates from the other modules, and that the emissions from these two modules were largely responsible for the total measured emissions rate to be greater than the allowable emissions rate. DAQ decided that the results from the test program would be acceptable if the following conditions were satisfied:

1. USS inspected and, if necessary, instituted repairs to Modules 4 and 7;

2. Following inspection and any necessary repair, emissions testing from Modules 4 and 7 was repeated;

3. Emissions testing from the two modules which were idle on November 17 and 18, 1992 (Modules 2 and 8) was also conducted in a manner similar to the testing of the other modules; and

4. The results from (i) the testing completed in November 1992 excluding the results from Modules 4 and 7, (ii) the retest of Modules 4 and 7, and (iii) the testing of Modules 2 and 8 showed compliance with the LAER standard.

The additional mass and visible emissions testing of Modules 2, 4, 7, and 8 was completed on August 24, 1993. Following the gravimetric analysis of the collected samples, Chester noticed unusual results from the samples collected from Module 2. The particulate catches by the sample train components are listed below:

Sample Train Component	Particulate Catch (g)
Filter	0.0000
Water Soluble Portion of Front Half	0.0518
Water Soluble Portion of Back Half	0.0069
Water Insoluble Portion of Back Half	0.0016

It has been Chester's experience that it is very unlikely scenario to collect 51.8 mg of material in the probe rinse and no material on the particulate filter. Chester believes that contamination of this sample occurred, although Chester is not certain of the mechanism or the timing of this event.

As such, a retest of Module 2 was completed on October 6, 1993 in accordance with the procedures used during the previous testing efforts. The results from the most recent round of testing have been summarized in Table 2. As before, the total particulate matter emissions rate was obtained by summing the emissions rate from each stack. The total particulate matter emissions rate from 14 exhausting stacks was 5.23 lb/hr. Since only 12 of the 14 stacks are operational at any particular time, the emission rate scaled to reflect normal operations would be equal to (12/14) * 5.23 lb/hr, or 4.48 lb/hr.

As before, the LAER standard is equal to 0.040 lb / ton coke pushed. On November 17 and 18, 1992, August 24, 1993, and October 6, 1993, the average pushing rate was 4.47 pushes per hour. Therefore, the allowable particulate matter emissions rate is equal to (0.040 lb / ton coke pushed) x (25.1 tons coke pushed / oven) x (4.47 ovens pushed / hour), or 4.49 lb/hr. The average particulate matter emissions rate determined in this test program is less than the allowable emissions rate.

Tables 1 and 2 also list other pertinent stack and sampling parameters including the exhaust gas flow rate in units of actual cubic feet per minute (acfm), standard cubic feet per minute (scfm), and dry standard cubic feet per minute (dscfm), moisture content of the exhaust gas, exhaust gas temperature, gas volume sampled for each test (dscf), and the isokinetics value for each test. The isokinetics value is equal to the ratio of the average linear gas velocity sampled through the probe nozzle to the average exhaust gas velocity. An isokinetics value between 90 percent and 110 percent is considered acceptable. One of the isokinetics values was very slightly above the acceptable range of values. Actual test sampling times have also been included in Tables 1 and 2.

The plume opacity data has been summarized in Table 3. No visible emissions were observed from any of the baghouse stacks during the test program. During the test program, the opacity of the plume from the containment shed was greater than or equal to 20 percent twice on November 18, 1992 and six times on August 24, 1993.

Copies of the mass emissions field data sheets can be found in Appendix A. Copies of the visible emissions field data sheets can be found in Appendix B. Copies of the plant operational data for each day of the test program for B Battery can be found in Appendix C. The analytical results and emissions calculations for each test can be found in Appendix D.

All sampling equipment was calibrated and operated in accordance with EPA Methods 1 through 5. Copies of the pre-test calibration results, post-test calibration results, and results of an audit of the control boxes conducted with a critical orifice provided by DAQ can be found in Appendix A. The post test calibrations of the control boxes used in November 1992 on Modules 3, 5, 7, 9, 12, and 13 yielded average dry gas meter coefficients which differed by more than five percent from the dry gas meter coefficients determined during the initial three point calibrations of the control boxes. Therefore, in accordance with EPA Method 5, the lower gas meter coefficients were used in the emissions calculations.

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CLAIRTON, PA

TABLE 1

B BATTERY BAGHOUSE
PARTICULATE MATTER EMISSIONS DATA - NOVEMBER 1992

Module Number		1	3	4	5	6	7	9
Test Number		CLR-M1-1	CLR-M3-1	CLR-M4-1	CLR-M5-1	CLR-M6-1	CLR-M7-1	CLR-M9-1
Test Date		11-17-92	11-17-92	11-17-92	11-17-92	11-18-92	11-18-92	11-17-92
Mass Emission Rate and Concentration								
Particulate Matter	(lb/hr)	0.28	0.30	1.02	0.26	0.33	1.09	0.31
	(gr/dscf)	0.0009	0.0019	0.0033	0.0010	0.0011	0.0033	0.0011
Stack Conditions								
Flow Rate	(acfm)	39200	20100	39600	32700	38300	41800	35400
	(scfm)	36700	18800	36500	30300	35400	38900	33100
	(dscfm)	36400	18700	36100	30000	35000	38500	32800
Temperature	(°F)	92	93	100	97	102	99	93
Moisture Content	(%)	0.7	0.7	1.1	1.0	1.1	1.1	0.8
Sampling Conditions								
Test times		0905 to 1005	0905 to 1005	1405 to 1505	1405 to 1505	0855 to 0955	0855 to 0955	0905 to 1005
		1015 to 1115	1015 to 1115	1520 to 1620	1520 to 1620	1010 to 1110	1010 to 1110	1015 to 1115
Sampling Time	(minutes)	120	120	120	120	120	120	120
Sample Volume	(dscf)	88.667	48.879	83.147	75.931	83.594	93.293	87.480
Isokinetics	(%)	101.9	109.8	96.6	106.0	100.1	101.7	93.4

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CLAIRTON, PA

TABLE 1

B BATTERY BAGHOUSE
PARTICULATE MATTER EMISSIONS DATA - NOVEMBER 1992

Module Number		10	11	12	13	14	Total
Test Number		CLR-M10-1	LR-M11-1	CLR-M12-1	CLR-M13-1	CLR-M14-1	
Test Date		11-17-92	11-17-92	11-17-92	11-18-92	11-18-92	
Mass Emission Rate and Concentration							
Particulate Matter	(lb/hr)	0.44	0.31	0.20	0.21	0.25	5.00
	(gr/dscf)	0.0014	0.0021	0.0015	0.0009	0.0016	
Stack Conditions							
Flow Rate	(acfm)	39200	18600	16400	29400	20100	370800
	(scfm)	36800	17500	15400	27600	18800	345800
	(dscfm)	36500	17300	15200	27300	18600	342400
Temperature	(°F)	90	90	91	94	97	
Moisture Content	(%)	0.7	1.0	1.1	1.2	1.1	
Sampling Conditions							
Test times		0905 to 1005	1405 to 1505	1405 to 1505	0855 to 0955	0855 to 0955	
		1015 to 1115	1520 to 1620	1620 to 1720	1010 to 1110	1010 to 1110	
Sampling Time	(minutes)	120	120	120	120	120	
Sample Volume	(dscf)	90.979	45.602	39.864	73.317	50.347	
Isokinetics	(%)	101.5	107.5	91.8	94.2	110.3	

USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 2

B BATTERY BAGHOUSE
PARTICULATE MATTER EMISSIONS DATA - ALL MODULES

Module Number		1	2	3	4	5	6	7	8
Test Number		CLR-M1-1	CLR-M2-3	CLR-M3-1	CLR-M4-2	CLR-M5-1	CLR-M6-1	CLR-M7-2	CLR-M8-2
Test Date		11-17-92	10-6-93	11-17-92	8-24-93	11-17-92	11-18-92	8-24-93	8-24-93
Mass Emission Rate and Concentration									
Particulate Matter	(lb/hr)	0.28	0.62	0.30	0.69	0.26	0.33	0.56	0.47
	(gr/dscf)	0.0009	0.0030	0.0019	0.0029	0.0010	0.0011	0.0024	0.0019
Stack Conditions									
Flow Rate	(acfm)	39200	26100	20100	32000	32700	38300	32200	33700
	(scfm)	36700	24200	18800	28300	30300	35400	28200	29700
	(dscfm)	36400	23900	18700	27600	30000	35000	27400	28800
Temperature	(°F)	92	108	93	126	97	102	133	129
Moisture Content	(%)	0.7	1.1	0.7	2.5	1.0	1.1	2.8	2.9
Sampling Conditions									
Test times		0905 to 1005	1120 to 1220	0905 to 1005	0937 to 1037	1405 to 1505	0855 to 0955	1225 to 1325	1225 to 1325
		1015 to 1115	1235 to 1335	1015 to 1115	1043 to 1143	1520 to 1620	1010 to 1110	1332 to 1432	1330 to 1430
Sampling Time	(minutes)	120	120	120	120	120	120	120	120
Sample Volume	(dscf)	88.667	59.563	48.879	57.074	75.931	83.594	54.555	50.829
Isokinetics	(%)	101.9	94.5	109.8	104.5	106.0	100.1	100.8	103.2

USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 2

B BATTERY BAGHOUSE
PARTICULATE MATTER EMISSIONS DATA - ALL MODULES

Module Number		9	10	11	12	13	14	Total
Test Number		CLR-M9-1	CLR-M10-1	CLR-M11-1	CLR-M12-1	CLR-M13-1	CLR-M14-1	
Test Date		11-17-92	11-17-92	11-17-92	11-17-92	11-18-92	11-18-92	
Mass Emission Rate and Concentration								
Particulate Matter	(lb/hr)	0.31	0.44	0.31	0.20	0.21	0.25	5.23
	(gr/dscf)	0.0011	0.0014	0.0021	0.0015	0.0009	0.0016	
Stack Conditions								
Flow Rate	(acfm)	35400	39200	18600	16400	29400	20100	413400
	(scfm)	33100	36800	17500	15400	27600	18800	380800
	(dscfm)	32800	36500	17300	15200	27300	18600	375500
Temperature	(°F)	93	90	90	91	94	97	
Moisture Content	(%)	0.8	0.7	1.0	1.1	1.2	1.1	
Sampling Conditions								
Test times		0905 to 1005	0905 to 1005	1405 to 1505	1405 to 1505	0855 to 0955	0855 to 0955	
		1015 to 1115	1015 to 1115	1520 to 1620	1620 to 1720	1010 to 1110	1010 to 1110	
Sampling Time	(minutes)	120	120	120	120	120	120	
Sample Volume	(dscf)	87.480	90.979	45.602	39.864	73.317	50.347	
Isokinetics	(%)	93.4	101.5	107.5	91.8	94.2	110.3	

CHESTER ENVIRONMENTAL

USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 3

B–BATTERY BAGHOUSE
VISIBLE EMISSIONS DATA SUMMARY

Baghouse Stacks

Observation Date	Number of Observations	Greatest Opacity (%)
11–17–92	1372	0
11–18–92	644	0
8–24–93	1200	0
10–6–93	588	0

Shed

Observation Date	Number of Observations	Number of Observations with Opacity >=20%	Average Time with Opacity > 20% (sec)
11–17–92	23	0	0
11–18–92	8	2	9
8–24–93	19	6	28
10–6–93	9	0	0

COMPLIANCE DEMONSTRATION
B BATTERY BAGHOUSE

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX A

TEST PROTOCOL, MASS EMISSIONS FIELD DATA SHEETS, CALIBRATION RESULTS

COMPLIANCE TEST PROTOCOL
B BATTERY
PUSHING EMISSIONS CONTROL SYSTEM

Prepared for:

USS CLAIRTON WORKS
CLAIRTON, PA

Prepared by:

KEYSTONE ENVIRONMENTAL RESOURCES
3000 TECH CENTER DRIVE
MONROEVILLE, PA 15146

PROJECT NUMBER: 300195-01

OCTOBER 1992

As required by the amended Mon Valley Consent Decree (Paragraph V.A. (5)(f)), a compliance demonstration will be conducted on the baghouse which controls the pushing emissions from B Battery operated at the USS Clairton Works. The purpose of this testing is to (1) determine the particulate matter emissions rates and concentrations from the exhaust stacks of the baghouse, (2) compare the measured particulate matter emissions rate with the allowable particulate matter emissions rate, (3) determine the presence of visible emissions from the baghouse exhaust stacks, and (4) measure the opacity of the plumes from the containment shed which result from the pushing of the coke. The two day test program will be performed during periods of normal plant production and operation.

Test procedures for this compliance demonstration will be performed in accordance with EPA Stationary Source Sampling Methods 1 through 4 and 5D, requirements set forth in Chapter 6, Chapter 18 (Section F), and Chapter 20 of the Allegheny County Health Department Bureau of Air Pollution Control (BAPC) Source Testing Manual, and Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual (Revision Number 1, January 1983).

The baghouse exhausts through fourteen individual stacks. Each stack has an internal diameter of 48 inches. Each diametral traverse of the stack will include 12 traverse points as calculated by EPA Stationary Source Sampling Method 1. Sampling will be conducted along 2 traverses, or 24 traverse points, with each point sampled for the 5 minutes, thus bringing the total sampling time to 2 hours for each exhaust stack. Sampling will be conducted through 2 sampling ports which are separated by 90° in the same horizontal plane. In accordance with EPA Method 5D, twelve of the fourteen exhaust stacks will be tested. Also, in accordance with Chapter 20 of the Allegheny County BAPC Source Testing Manual, a single test run will be performed for each of the twelve stacks. A schematic diagram of the stack and traverse points is presented in Figure 1.

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

During each test, gas concentrations of carbon dioxide (CO_2), oxygen (O_2), and nitrogen (N_2, by difference), will be determined with the use of a Bacharach "Fyrite" apparatus as specified by EPA Method 3. Gas concentrations will be used to obtain molecular weight of the exhaust gas on a dry basis.

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

As specified by EPA Method 5D, each sample train will be assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated so that isokinetic conditions are maintained. A minimum of 50 dry standard cubic feet will be sampled as required by Section 139.12 (4) of the PA DER Source Testing Manual. Clean up of the sampling train will include a water rinse followed by an acetone rinse of both the front-half and back-half components of the sample train, as per PA DER particulate matter test method requirements. The water soluble and water insoluble portions of the front-half of the sampling train will be determined as a total; that is, the water rinse will not be filtered to determine soluble and insoluble portions. However, the water soluble and water insoluble portions of the back-half will be determined separately in accordance with Section 139.12 of the PA DER Source Testing Manual. The water contained in the first three impingers and back-half water rinses will be filtered under suction through a preweighed 0.22 micrometer porosity filter. The filter used to capture the insoluble material will be dried, desiccated, and weighed to a constant weight. Front-half acetone and water rinses and back-half acetone and water soluble rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. Sample train filters will be desiccated for 24 hours, and particulate matter weight will be determined gravimetrically. Rinse residue weights and filter weights will be measured to the nearest 0.1 milligram. One acetone blank and one deionized, distilled water blank will be prepared in the same manner as the test sample rinses. The blank weights will be subtracted from the test sample weights. After blank correction, front-half water and acetone residue weights, sample filter weights, and back-half water insoluble filter weights will added together to determine total particulate matter catch.

All visible emissions determinations from the baghouse exhaust stacks and pushing control shed will be performed in accordance with EPA Stationary Source Sampling Method 9 and

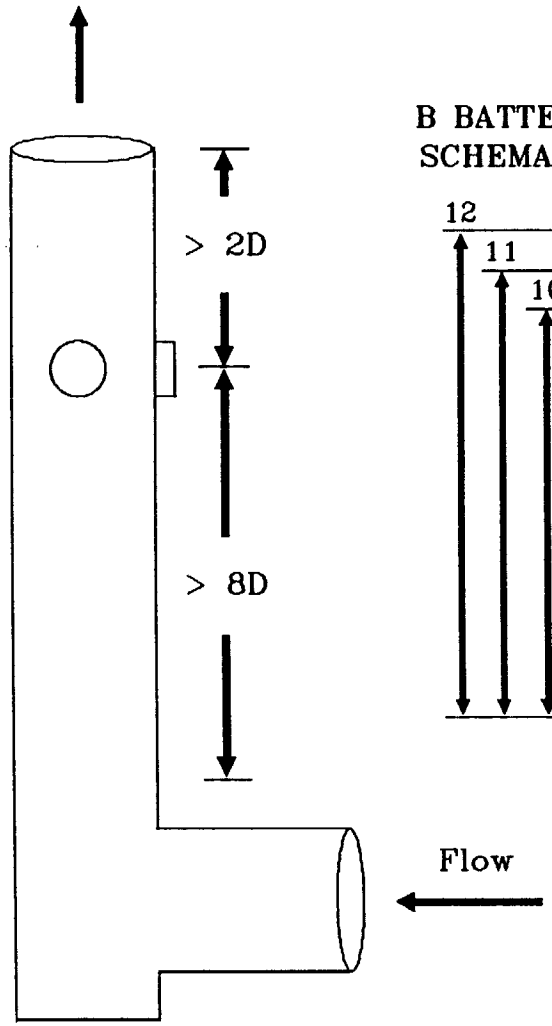
BAPC Method 18F. Visible emissions from the exhausts stacks will be recorded for the duration of all particulate matter sampling periods. All plume opacity measurements will also be performed in accordance with EPA Method 9 and BAPC Method 18F. During the measurement of visible emissions from the containment shed which result from the pushing of coke, the maximum plume opacity and length of time (in seconds) when the plume opacity is greater than or equal to 20 percent will be recorded.

A report summarizing the compliance test program will be submitted within 60 days following completion of field work. The report will describe test methodologies utilized and present a textual and tabular summary of the emissions results and related sampling information. Copies of operational data will be included in the report to verify that all testing was performed during periods of normal plant operation. Also incorporated into the report will be copies of the pre-test calibration results, post-test calibration results, the results of an audit conducted with a critical orifice provided by the BAPC, field data sheets for the particulate matter sampling and visible emissions determinations, computer-generated emissions calculations, and analytical results for each test.

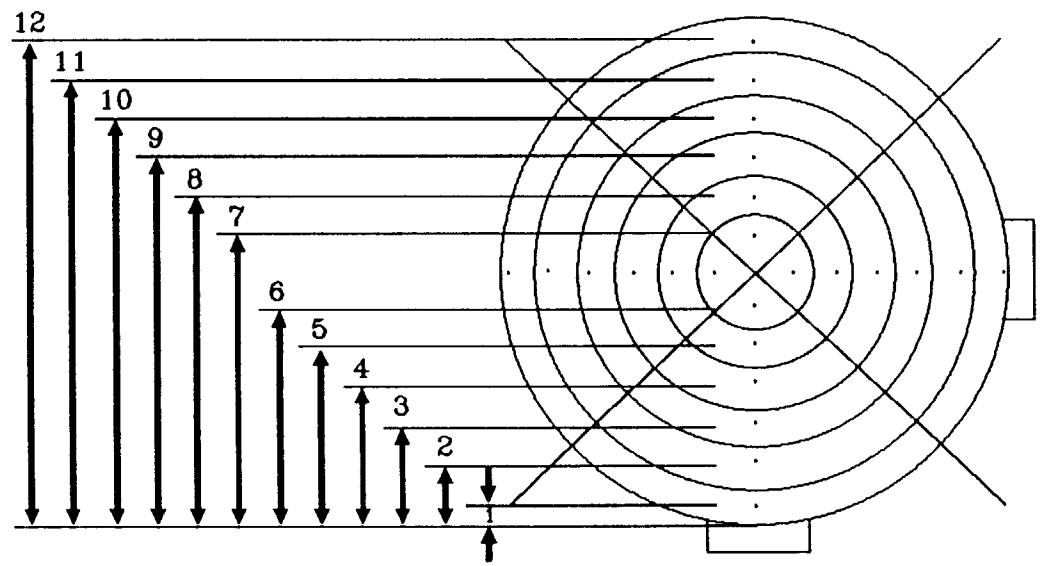
FIGURE 1

USS CLAIRTON WORKS
CLAIRTON, PA

B BATTERY PUSHING EMISSIONS CONTROL SYSTEM
SCHEMATIC OF THE STACK AND TRAVERSE POINTS



Stack Diameter (D) = 48 inches



Traverse Point	Distance (inches)	Traverse Point	Distance (inches)
1	1.0	7	30.9
2	3.2	8	36.0
3	5.7	9	39.5
4	8.5	10	42.3
5	12.0	11	44.8
6	17.1	12	47.0

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (▲H@) 1.756	HOT/COLD BOX NO. 5
TEST UNIT B-Battery PEC	TEST NO. CLR-M1-1	METER CORRECTION (Y) .9721	PROBE NO. 5-2
PROJECT NO. 300195.01	NOZZLE (SIZE,#) #45 .214	CALIBRATION DATE 6-03-92	FILTER NO. 148 Qtz.
TEST CREW [illegible]	STATIC PRESSURE -0.25"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION North	CONTROL BOX NO. 4	PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ▲P (in. H2O)	Orifice ▲H Required (in. H2O)	Orifice ▲H Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	905	709.052	0.40	0.81	0.81	60	60	3.5	84	250	ICED DOWN	250	5 min./point
44.8	910		0.50	1.01	1.01	60	61	4.0	92		<68°		
42.3	915		0.50	1.01	1.01	60	63	4.0	91				
39.5	920		0.60	1.21	1.21	62	65	4.0	98				
36.0	925		0.70	1.41	1.41	62	64	4.5	94				
30.9	930		0.70	1.41	1.41	64	65	4.5	92				
17.1	935		0.60	1.21	1.21	64	65	4.0	92				
12.0	940		0.75	1.51	1.51	65	66	4.5	96				
8.5	945		1.0	2.01	2.01	65	66	5.0	94				
5.7	950		1.2	2.41	2.41	65	66	5.8	99				
3.2	955		1.2	2.41	2.41	67	68	5.5	98				
1.0	1000		1.3	2.62	2.62	66	68	6.5	89				
	1005	752.458											
													Estimates:
													MW= 28.8
													%H2O= 2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	.011
After	8.0	0.018

PITOT LEAK CHECK

	Positive	Negative
Before	OK 15 SEC.	OK 15 SEC.
After	OK 15 SEC.	OK 15 SEC.

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL H_2O	539.5	557.0	-17.5
2.	100mL H_2O	557.5	548.4	9.1
3.	Empty	470.6	467.4	3.2
4.	Silica Gel	607.5	588.7	18.8
5.				

-5.2g

total = 13.6g

AQE 6/92

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (▲H@) 1.756	HOT/COLD BOX NO. 5
TEST UNIT B-Battery PEC	TEST NO. CLR-M1 -1	METER CORRECTION (Y) .9721	PROBE NO. 5-2
PROJECT NO. 300195-01	NOZZLE (SIZE,#) #45 .214	CALIBRATION DATE 6-03-92	FILTER NO. 148 QTZ.
TEST CREW PJ & RC	STATIC PRESSURE +0.45"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION EAST	CONTROL BOX NO. 4	PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ▲P (in. H2O)	Orifice ▲H Required (in. H20)	Orifice ▲H Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1015	752.458	1.0	2.01	2.01	66	67	5.0	89	250	ICED DOWN <68°	250	5 min./point
44.8	1020		1.0	2.01	2.01	66	67	5.0	88				
42.3	1025		1.0	2.01	2.01	66	68	5.0	88				
39.5	1030		1.0	2.05	2.05	67	68	5.0	87				
36.0	1035		0.7	1.44	1.44	68	68	4.0	87				
30.9	1040		0.5	1.03	1.03	68	69	4.0	95				
17.1	1045		0.9	1.85	1.85	67	68	5.0	90				
12.0	1050		1.1	2.26	2.26	68	69	5.5	88				
8.5	1055		1.3	2.67	2.67	68	69	6.5	95				
5.7	1100		1.6	3.28	3.28	68	69	7.5	93				
3.2	1105		.05	0.10	0.10	68	68	2.0	90				
1.0	1110		1.1	2.26	2.26	67	67	5.5	91				
	1115	801.620											
	Δ=120 min	Δ=92.568 dcf	$(\Delta P)_{AVG}$ =	$(\Delta H)_{AVG}$	=1.75	$(T_{meter})_{AVG}$	= 66°F		$(T_{stack})_{AVG}$	= 92°F			
			0.8										Estimates:
													MW=28.8
													%H2O= 2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 8-24-93	ORIFICE CORRECTION (ΔH@) 2.002	HOT/COLD BOX NO. 2
TEST UNIT B-Battery Baghouse	TEST NO. CLR-M28-2	METER CORRECTION (Y) 0.9812	PROBE NO. 5-1
PROJECT NO. 300195-01	NOZZLE (SIZE,#) #44 0.217	CALIBRATION DATE 6-9-93	FILTER NO. 1055
TEST CREW RPC	STATIC PRESSURE +0.4" H_2O	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.40	PORT DIRECTION ~~NORTH~~ NE	CONTROL BOX NO. 6	PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	09:37	562.700	.50	1.26	1.26	87	87	2.5	105	250	<68	250	5 min./point
44.8			.45	2.52	252	99	87	2.5	109				
42.3			.60	1.51	1.57	110	90	3.0	108				
39.5			.45	1.13	1.13	111	94	2.0	109				
36.0			.45	1.13	1.13	112	94	2.0	115				
30.9			.45	1.13	1.13	118	96	2.0	118				
17.1			.40	1.01	101	121	99	2.0	118				
12.0			.40	1.01	1.01	122	100	2.0	127				
8.5			.30	.76	.76	123	101	1.5	123				
5.7			30	.76	.76	122	102	1.5	121				
3.2			30	.76	.76	123	103	1.5	120				
1.0	10:37	597.888	.45	1.13	1.13	123	103	2.5	120				
	~~10:37~~												
													Estimates:
													MW= 28.9/51
													%H2O= 2

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.01 cfm
After	5.0	0.005

PITOT LEAK CHECK

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

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL D.I. H_2O	491.1	480.2	10.9
2.	100mL D.I. H_2O	546.4	540.2	6.2
3.	Empty	436.5	434.3	2.2
4.	Silica Gel	590.8	577.9	12.9
5.				
6.	Actual			32.2g total
7.	Moisture = 2.5%			
8.				

19.3g

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT	USS CLAIRTON WORKS	TEST DATE	8-24-93	ORIFICE CORRECTION (ΔH@)	2.002	HOT/COLD BOX NO.	2
TEST UNIT	B-BATTERY BAGHOUSE	TEST NO.	CLK-M2-2	METER CORRECTION (Y)	0.9812	PROBE NO.	5-1
PROJECT NO.	300195-01	NOZZLE (SIZE,#)	0.217 #44	CALIBRATION DATE	06-09-93	FILTER NO.	1055
TEST CREW	RPC	STATIC PRESSURE	0.4" H_2O	PITOT CORRECTION	0.84	STACK DIA.	48
BAROMETRIC PRESSURE	29.40	PORT DIRECTION	~~EAST~~ SE	CONTROL BOX NO.	6	PORT SIZE	4.0

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	10:39	577.898	.30	.76	.76	109	104	1.0	120	250	68°F	250	5 min./point
44.8			.20	.50	.50	120	104	1.0	128				
42.3			.30	.76	.76	118	103	1.0	130				
39.5			.20	.50	.50	116	104	1.0	129				
36.0			.20	.50	.50	116	104	1.0	126				
30.9			.20	.50	.50	120	104	1.0	124				
17.1			.50	1.26	1.26	120	104	2.0	126				
12.0			.50	1.26	1.26	127	104	2.0	131				
8.5			.45	1.13	1.13	126	104	2.0	132				
5.7			.50	1.26	1.20	127	104	2.0	130				
3.2			.60	1.51	1.51	129	104	2.0	132				
1.0	11:39	629.550	.60	1.57	1.57	130	107	2.0	126				
Test Totals	Δ = 120 min	Δ = 66.850 dcf	$(\Delta P)_{AVG}$ = 0.40	$(\Delta H)_{AVG}$ =	1.07	$(T_{meter})_{AVG}$ = 109°F			$(T_{stack})_{AVG}$ = 122°F				
													Estimates:
													MW= 28.851
				velocity = 37.8 ft/sec				Iso. = 98.7 %					%H2O= 2

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 10-6-93	ORIFICE CORRECTION (ΔH@) 1.572	HOT/COLD BOX NO. 5/7
TEST UNIT B-Battery Baghouse	TEST NO. CLR-M2-3	METER CORRECTION (Y) 1.0151	PROBE NO. 5-3
PROJECT NO. Module #2	NOZZLE (SIZE,#) 0.225"	CALIBRATION DATE 7-2-93	FILTER NO. 1089
TEST CREW TM JS RC	STATIC PRESSURE +0.15" H_2O	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.84	PORT DIRECTION NE	CONTROL BOX NO. 3	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	11:20	057.312	.20	.43	.43	70	68	1.0	100	~250	<68	~250	5 min./point
44.8	25		.21	.45	.45	76	72	1.0	105		ICED		
42.3	30		.25	.55	.55	90	70	1.0	103				
39.5	35		.25	.54	.54	98	70	1.0	115				
36.0	40		.28	.63	.63	100	70	1.0	120				
30.9	45		.30	.65	.65	100	70	1.0	114				
17.1	50		.43	.95	.95	102	72	1.5	104				
12.0	55		.40	.89	.89	108	74	1.5	101				
8.5	12:00		.42	.93	.93	108	76	1.5	106				
5.7	5		.32	.70	.70	106	76	1.0	105				
3.2	10		.42	.92	.92	112	78	1.5	115				
1.0	15		.21	.46	.46	112	78	1.0	105				
	12:20	086.354											
													Estimates:
													MW= 28.5
													%H2O= 3

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.006
After	5.0	0.007

PITOT LEAK CHECK 15 sec

	Positive	Negative
Before	OK	OK
After	OK	OK

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI H_2O	483.6	483.8	-0.2
2.	100mL DI H_2O	562.2	559.1	3.1
3.	Empty	450.4	449.0	1.4
4.	Silica Gel	650.9	641.1	9.8
5.				
6.	Actual		total =	14.1 g
7.	Moisture = 1.1%			
8.				

4.3 g

⇒ MW = 28.70

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 10-6-93	ORIFICE CORRECTION (ΔH@) 1.572	HOT/COLD BOX NO. 5/7
TEST UNIT B-Battery Baghouse	TEST NO. CLR-M2-3	METER CORRECTION (Y) 1.0151	PROBE NO. 5-3
PROJECT NO. Module #2	NOZZLE (SIZE,#) 0.225"	CALIBRATION DATE 7-2-93	FILTER NO. 1089
TEST CREW TM JS RC	STATIC PRESSURE +0.15" H2O	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.84	PORT DIRECTION SE	CONTROL BOX NO. 3	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	12:35	086.954	.60	1.29	1.29	84	72	2.0	113	~250	<68	~250	5 min./point
44.8	:40		.70	1.58	1.58	110	84	4.0	103				
42.3	:45		.70	1.61	1.61	115	84	4.0	99				
39.5	:50		.70	1.59	1.59	117	85	4.0	104				
36.0	:55		.60	1.37	1.37	120	86	3.5	107				
30.9	13:00		.43	0.98	0.98	115	88	2.0	106				
17.1	:5		.31	0.70	0.70	118	88	1.0	111				
12.0	:10		.25	0.57	0.57	120	90	1.0	108				
8.5	:15		.27	0.62	0.62	120	92	1.0	104				
5.7	:20		.26	0.59	0.59	121	92	1.0	115				
3.2	:25		.20	0.45	0.45	122	92	1.0	112				
1.0	:30		.19	0.43	0.43	122	92	1.0	121				
	13:35	118.808											
Test Totals	Δ= 120 min	Δ= 61.496 dcf	$(\Delta P)_{AVG}$ = 0.35	$(\Delta H)_{AVG}$ =	0.83 velocity	$(T_{meter})_{AVG}$ = 93°F = 34.6 ft/sec			$(T_{stack})_{AVG}$ = 108°F ISO. = 94.5%				Estimates: MW=28.5 %H2O=3

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

CHESTER ENVIRONMENTAL

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT	USS Clairton Works	TEST DATE	11-17-92	ORIFICE CORRECTION (ΔH@) 1.985	HOT/COLD BOX NO. 4
TEST UNIT	B-Battery PEC	TEST NO.	CU2-M3 -1	METER CORRECTION (Y) 0.9617	PROBE NO. 5-5
PROJECT NO.	300195-01	NOZZLE (SIZE,#)	#54 0.214	CALIBRATION DATE 5-20-92	FILTER NO. 147QTZ
TEST CREW	TM, RC, PS, JS.	STATIC PRESSURE	0.20"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE	29.24	PORT DIRECTION	NORTH	CONTROL BOX NO. 6	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	9:05	425.840	0.10	0.23	0.23	53	52	2.0	90	250	<68	250	5 min./point
44.8			0.10	0.23	0.23	59	52	2.0	90				
42.3			0.10	0.23	0.23	67	53	2.0	90	252	51	252	
39.5			0.10	0.23	0.23	70	55	2.0	90				
36.0			0.10	0.23	0.23	73	57	2.0	92	252	50	249	
30.9			0.12	0.28	0.28	75	59	2.0	93				
17.1			0.25	0.58	0.58	79	59	2.0	93	251	50	250	
12.0			0.30	0.69	0.69	81	61	2.0	93				
8.5			0.33	0.76	0.76	83	63	2.0	94	250	51	251	
5.7			0.28	0.65	0.65	83	64	2.0	94				
3.2			0.28	0.65	0.65	84	65	2.0	94	252	52	252	
1.0	10:05	439.392	0.25	0.58	0.58	84	65	2.0	94				
													Estimates:
													MW=28.8
													%H2O= 2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.008
After	5.5	0.016

PITOT LEAK CHECK 15 sec

	Positive	Negative
Before	OK	OK
After	0"/15sec	0"/15sec

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL H_2O	565.3	570.5	-5.2
2.	100mL H_2O	576.4	573.0	3.4
3.	Empty	378.5	377.8	.7
4.	200g Silica Gel	585.4	577.0	8.4
5.				

-1.1g

total = 7.3g

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (ΔH@) 1.985	HOT/COLD BOX NO. 4
TEST UNIT B-Battery PEC	TEST NO. CLR-M3 -1	METER CORRECTION (Y) 0.9617	PROBE NO. 5-3
PROJECT NO. 300195-01	NOZZLE (SIZE,#) #54 0.214	CALIBRATION DATE 5-20-92	FILTER NO. 147 QTZ
TEST CREW TM, RC, JS, PS	STATIC PRESSURE 0.20"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION EAST	CONTROL BOX NO. 6	PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	10:15	459.392	0.20	0.46	0.46	63	64	2.0	93	250	<68	250	5 min./point
44.8			.22	.51	.51	75	63	2.0	93		SELL DOWN		
42.3			.23	.53	.53	79	63	2.0	92				
39.5			.25	.58	.58	80	64	2.0	91				
36.0			.30	.69	.69	82	64	2.0	91				
30.9			.21	.48	.48	82	65	2.0	91				
17.1			.23	.53	.53	82	65	2.0	95				
12.0			.19	.44	.44	83	65	2.0	94				
8.5			.19	.44	.44	83	65	2.0	95				
5.7			.23	.53	.53	84	65	2.0	94				
3.2			.25	.58	.58	84	67	2.0	94				
1.0	11:15	477.875	.24	.55	.55	84	67	2.0	94				
	Δ=120 min	Δ=52.035 dcf	$(\Delta P)_{AVG}$ = 0.21	$(\Delta H)_{AVG}$ = 0.49		$(T_{meter})_{AVG}$ = 69°F			$(T_{stack})_{AVG}$ = 93°F				
													Estimates:
													MW= 28.8
													%H2O=2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (▲H@) 1.756	HOT/COLD BOX NO. 4
TEST UNIT B-Battery PEC	TEST NO. CLR-MH-1	METER CORRECTION (Y) 0.9721	PROBE NO. 5-2
PROJECT NO. 3001965-01	NOZZLE (SIZE,#) #45 0.214	CALIBRATION DATE 6-3-92	FILTER NO. 151 QTZ
TEST CREW TM, RC, JS, PS	STATIC PRESSURE 0.30	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION North	CONTROL BOX NO. 4	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ▲P (in. H2O)	Orifice ▲H Required (in. H20)	Orifice ▲H Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	14:05	802.200	0.30	0.60	0.60	62	64	3.0	90	250	<68°F Ice/Water	250	5 min./point
44.8			0.30	0.60	0.60	63	65	3.0	100				
42.3			0.40	0.81	0.81	64	64	4.0	97	251	50	248	
39.5			0.40	0.81	0.81	66	64	4.0	93				
36.0			0.45	0.91	0.91	68	67	4.0	93	254	50	249	
30.9			0.60	1.21	1.21	68	67	4.0	95				
17.1			0.80	1.61	1.61	68	67	5.0	95	252	50	245	
12.0			1.00	2.02	2.02	70	67	5.0	103				
8.5			1.20	2.41	2.41	70	67	6.0	104	254	49	240	
5.7			1.30	2.61	2.61	69	69	6.0	~~100~~				
3.2			1.40	2.81	2.81	72	70	7.0	96	252	50	248	
1.0	15:05	845.030	1.40	2.81	2.81	72	70	7.0	102				
													Estimates:
													MW= 28.8
													%H2O=2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	3.0	0.006
After	7.0	0.011

PITOT LEAK CHECK 15 sec

	Positive	Negative
Before	ok	ok
After	ok	ok

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL H_2O	563.3	569.5	-6.2
2.	100 mL H_2O	580.3	573.6	6.7
3.	Empty	379.3	378.3	1.0
4.	Silica Gel	601.9	584.4	17.5
5.				

1.5g

Total = 19.0g

AQE 6/92

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT	USS Clairton Works	TEST DATE	11-17-92	ORIFICE CORRECTION (▲H@) 1.756	HOT/COLD BOX NO. 4
TEST UNIT	B-Battery PEC	TEST NO.	CLR-M4-1	METER CORRECTION (Y) 0.9721	PROBE NO. 5-2
PROJECT NO.	3001985-01	NOZZLE (SIZE,#)	#45 0.214	CALIBRATION DATE 6-3-92	FILTER NO. 151 QTZ
TEST CREW	TM	STATIC PRESSURE	0.30	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE	29.24	PORT DIRECTION	~~South~~ East	CONTROL BOX NO. 4	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ▲P (in. H2O)	Orifice ▲H Required (in. H20)	Orifice ▲H Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	15:20	845.030	0.40	0.81	0.81	69	68	3.0	96	250	<68°F	250	5 min./point
44.8			0.50	1.00	1.00	67	68	3.5	110				
42.3			1.00	1.99	1.99	69	69	5.0	98				
39.5			1.00	1.99	1.99	69	70	5.0	100				
36.0			1.00	1.99	1.99	69	70	5.0	104				
30.9			0.50	1.00	1.00	70	71	4.0	110				
17.1			0.75	1.49	1.49	70	70	4.2	108				
12.0			1.00	1.99	1.99	70	68	5.0	102				
8.5			0.90	1.79	1.79	70	70	5.0	105				
5.7			1.00	1.99	1.99	70	70	5.0	104				
3.2			1.00	1.99	1.99	69	71	5.0	99				
1.0	16:20	889.365	1.00	1.99	1.99	70	71	5.0	100				
	$\Delta = 120$ min	$\Delta = 87.165$ dcf	$(\Delta P)_{AVG}$ = 0.80	$(\Delta H)_{AVG}$ = 1.63		$(T_{meter})_{AVG}$ = 68°F			$(T_{stack})_{AVG}$ = 100°F				
													Estimates:
													MW= 28.8
													%H2O= 2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 8-24-93 (Tues.)	ORIFICE CORRECTION (ΔH@) 1.802	HOT/COLD BOX NO. 4
TEST UNIT B-Battery Baghouse	TEST NO. CLR-M4-2	METER CORRECTION (Y) 0.9619	PROBE NO. 5-3 (Glass Liner)
PROJECT NO. 30195-01	NOZZLE (SIZE,#) 0.195	CALIBRATION DATE 5-17-93	FILTER NO. 1053
TEST CREW RC, JB	STATIC PRESSURE 0.2" H_2O	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.40	PORT DIRECTION NE	CONTROL BOX NO. 7	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	0937	666.755	0.30	0.43	0.43	100	94	1.0	126	250	268	250	5 min./point
44.8			0.30	0.43	0.43	110	92	1.0	123				
42.3			0.30	0.43	0.43	116	93	1.0	121				
39.5			0.30	0.43	0.43	121	96	1.0	122				
36.0			0.30	0.43	0.43	123	98	1.0	121				
30.9			0.40	0.59	0.59	127	100	1.5	120				
17.6			0.80	1.19	1.19	130	102	3.0	120				
12.0			0.80	1.19	1.19	132	104	3.0	125				
8.5			0.90	1.34	1.34	134	106	3.0	124				
5.7			0.90	1.34	1.34	135	107	3.0	122				
3.2			0.80	1.20	1.20	136	108	3.0	121				
1.3		699.873	0.60	0.90	0.90	136	109	2.0	116				
													Estimates:
													MW= 28.957
													%H2O= 2

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.010
After	4.0	0.010

PITOT LEAK CHECK 15 sec

	Positive	Negative
Before	OK	OK
After	OK	OK

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI. H_2O	572.9	558.5	14.4
2.	100mL DI. H_2O	482.0	477.2	4.8
3.	Empty	456.5	455.2	1.3
4.	Silica Gel	674.4	664.3	10.1
5.				
6.	Actual			30.69
7.	Moisture = 2.5%			10.28
8.				

20.5

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 8-24-93-(Tues)	ORIFICE CORRECTION (ΔH@) 1.802	HOT/COLD BOX NO. 4
TEST UNIT B-Battery Baghouse	TEST NO. CLR-M4-2	METER CORRECTION (Y) 0.969	PROBE NO. 5-3 (Glass Liner)
PROJECT NO. 300195-01	NOZZLE (SIZE,#) 0.195	CALIBRATION DATE 5-17-93	FILTER NO. 1053
TEST CREW RC/JS	STATIC PRESSURE 0.2" H_2O	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.40	PORT DIRECTION SE	CONTROL BOX NO. 7	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1043	699.873	0.80	1.20	1.20	119	108	3.0	130	250	<68	250	5 min./point
44.8			0.90	1.34	1.34	141	112	3.0	128				
42.3			1.00	1.49	1.49	142	113	3.5	134				
39.5			0.80	1.20	1.20	142	114	3.0	123				
36.0			0.80	1.20	1.20	141	113	3.0	128				
30.9			0.70	1.05	1.05	141	113	2.5	125				
17.1			0.20	0.30	0.30	138	113	1.0	137				
12.0			0.20	0.30	0.30	137	112	1.0	134				
8.5			0.20	0.30	0.30	137	112	1.0	131				
5.7			0.20	0.30	0.30	137	112	1.0	132				
3.2			0.20	0.30	0.30	138	113	1.0	128				
1.0	1143	732.837	0.20	0.30	0.30	139	113	1.0	124				
Test	Δ=	Δ=	$(\Delta P)_{AVG}$	$(\Delta H)_{AVG}$	=	$(T_{meter})_{AVG}$	= 119°F		$(T_{stack})_{AVG}$	= 126°F			
Totals	120	66.082	=		0.80								Estimates:
	min	dcf	0.50							104.4			MW= 28.851
					velocity	≐ 42.4	ft/sec	Iso.	≐	~~103.9~~	%		%H2O= 2

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

CHESTER ENVIRONMENTAL

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (▲H@) 1.985	HOT/COLD BOX NO. 2
TEST UNIT B-Battery PEC	TEST NO. CU2-M5-1	METER CORRECTION (Y) 0.9617	PROBE NO. 5-5
PROJECT NO. 300P6501	NOZZLE (SIZE,#) 0.214 #54	CALIBRATION DATE 5-20-92	FILTER NO. 149 QTZ
TEST CREW RPC, TM, PS, JS, JS	STATIC PRESSURE 0.60"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION North	CONTROL BOX NO. 6	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ▲P (in. H2O)	Orifice ▲H Required (in. H2O)	Orifice ▲H Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	14:05	470.220	.75	1.78	1.78	60	59	5.0	84	250	<68°F	250	5 min./point
44.8			.75	1.78	1.78	74	59	5.0	91				
42.3			.60	1.42	1.42	79	60	4.5	89				
39.5			.65	1.54	1.54	84	62	4.5	87				
36.0			.65	1.54	1.54	85	63	4.5	85				
30.9			.65	1.54	1.54	89	65	4.5	94				
17.1			.55	1.30	1.30	89	67	4.0	97				
12.0			.60	1.42	1.42	90	67	4.5	102				
8.5			.75	1.78	1.78	91	69	5.0	103				
5.7			.55	1.30	1.30	93	70	4.0	100				
3.2			.55	1.30	1.30	93	72	4.0	91				
1.0	15:05	520.000	.55	1.30	1.30	93	72	4.0	91				
													Estimates:
													MW= 28.8
													%H2O=2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.010
After	8.0	0.015

PITOT LEAK CHECK

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

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100ml H_2O	470.5	476.7	-6.2
2.	100ml H_2O	568.7	563.2	5.5
3.	Empty	452.0	449.3	2.7
4.	Silica Gel	638.8	624.8	14.0
5.				

2.0g

total = 16.0g

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (ΔH@) 1.985	HOT/COLD BOX NO. 2
TEST UNIT B-Battery PEC	TEST NO. CU2-M5-1	METER CORRECTION (Y) 0.9617	PROBE NO. 5-5
PROJECT NO. 300F~~005~~ 01	NOZZLE (SIZE,#) 0.214 #54	CALIBRATION DATE 5-20-92	FILTER NO. 149 QTZ
TEST CREW RPC, TM, JS, JS, PS	STATIC PRESSURE 0.60"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION ~~SOUTH~~ EAST	CONTROL BOX NO. 6	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	15:20	520.000	.30	.72	.72	72	67	3.0	95	250	68°F	250	5 min./point
44.8			.45	1.07	1.07	75	67	3.5	95				
42.3			.25	0.60	0.60	85	67	3.0	99				
39.5			.30	0.72	0.72	85	69	3.0	99				
36.0			.25	0.60	0.60	87	69	3.0	101				
30.9			.30	0.72	0.72	89	69	3.0	102				
17.1			.50	1.19	1.19	91	69	4.0	104				
12.0			.70	1.67	1.67	92	70	5.0	107				
8.5			.90	2.15	2.15	93	70	7.0	105				
5.7			1.0	2.39	2.39	93	71	7.5	101				
3.2			1.1	2.63	2.63	93	71	8.0	99				
1.0			0.8	1.91	1.91	93	71	6.0	95				
	1620	560.080											
	Δ=120 min	Δ=81.860 dcf	$(\Delta P)_{avg}$ = 0.55	$(\Delta H)_{avg}$ = 1.43		$(T_{meter})_{avg}$ = 77°F			$(T_{stack})_{avg}$ = 97°F				
													Estimates:
													MW= 28.8
													%H2O= 2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-18-92	ORIFICE CORRECTION (ΔH@) 1.756	HOT/COLD BOX NO. 4
TEST UNIT B Battery PEC	TEST NO. CLR-M6-1	METER CORRECTION (Y) 0.9721	PROBE NO. 5-2
PROJECT NO. 300195-01	NOZZLE (SIZE,#) 0.214 #45	CALIBRATION DATE 6-3-92	FILTER NO. 155 QTZ
TEST CREW JPS	STATIC PRESSURE 0.05"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.44	PORT DIRECTION North	CONTROL BOX NO. 4	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
JPS 47.0	0855	889.590	~~0.25~~ ~~0.03~~	~~0.85~~ ~~0.87~~ 0.49	~~0.86~~ 0.49	53	52	3.0	97	250	<68°F	250	5 min./point
44.8			0.25	0.49	0.49	54	52	3.0	108				
42.3			0.30	0.59	0.59	55	54	3.0	102				
39.5			0.35	0.69	0.69	57	55	3.0	100				
36.0			0.40	0.78	0.78	57	58	3.1	115				
30.9			0.45	0.88	0.88	58	59	3.2	109				
17.1			0.60	1.18	1.18	57	58	4.0	105				
12.0			0.80	1.57	1.57	59	59	4.6	101				
8.5			1.10	2.15	2.15	59	60	5.8	109				
5.7			1.20	2.35	2.35	60	60	6.0	106				
3.2			1.30	2.55	2.55	61	61	6.0	101				
1.0	0955	928.733	1.20	2.35	2.35	61	60	6.0	99				
													Estimates:
													MW=28.8
													%H2O=2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.012
After	7.0	0.016

PITOT LEAK CHECK

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

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL H_2O	569.3	571.5	-2.2
2.	100mL H_2O	579.9	573.5	6.4
3.	Empty	379.0	378.4	0.1
4.	Silica Gel	590.6	574.9	15.7
5.				

4.3g

total = 20.0g

AQE 6/92

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT	USS Clairton Works	TEST DATE	11-18-92	ORIFICE CORRECTION (▲H@) 1.756	HOT/COLD BOX NO. 4
TEST UNIT	B- Battery PEC	TEST NO.	CLR-M6-1	METER CORRECTION (Y) 0.9721	PROBE NO. 5-2
PROJECT NO.	300195 to 1	NOZZLE (SIZE,#)	0.214 # 45	CALIBRATION DATE 6-3-92	FILTER NO. 155 QTZ
TEST CREW	JPS	STATIC PRESSURE	0.40"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE	29.44	PORT DIRECTION	East	CONTROL BOX NO. 4	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ▲P (in. H2O)	Orifice ▲H Required (in. H2O)	Orifice ▲H Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1010	928.733	0.70	1.39	1.39	58	58	4.0	97	250	<68°F	250	5 min./point
44.8			0.90	1.78	1.78	59	60	5.0	97				
42.3			1.00	1.98	1.98	60	59	5.1	96				
39.5			0.90	1.78	1.78	60	60	5.0	95				
36.0			0.90	1.78	1.78	60	60	5.0	95				
30.9			0.60	1.19	1.19	60	59	4.0	105				
17.1			0.50	0.99	0.99	60	59	3.4	100				
12.0			0.70	1.39	1.39	59	60	4.1	113				
8.5			1.10	2.18	2.18	60	61	5.5	108				
5.7			1.30	2.57	2.57	59	60	6.5	101				
3.2			1.30	2.57	2.57	58	58	6.5	99				
1.0	1110	975.147	1.30	2.57	2.57	61	62	6.5	100				
	Δ=120 min	Δ=85.557 dcf	$(\Delta P)_{avg}$ = 0.75	$(\Delta H)_{avg}$ = 1.59		$(T_{meter})_{avg}$ = 59°F			$(T_{stack})_{avg}$ = 102°F				
													Estimates:
													MW= 28.8
													%H2O=2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT	USS Clairton Works	TEST DATE	11-18-92	ORIFICE CORRECTION (▲H@)	1.985	HOT/COLD BOX NO.	5
TEST UNIT	B-Battery PEC	TEST NO.	CLR-M7-1	METER CORRECTION (Y)	0.9617	PROBE NO.	5-5
PROJECT NO.	300PST-01	NOZZLE (SIZE,#)	0.214 #54	CALIBRATION DATE	5-20-92	FILTER NO.	157
TEST CREW		STATIC PRESSURE	0.60	PITOT CORRECTION	0.84	STACK DIA.	48"
BAROMETRIC PRESSURE	29.44	PORT DIRECTION	North	CONTROL BOX NO.	6	PORT SIZE	4"

	Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ▲P (in. H2O)	Orifice ▲H Required (in. H20)	Orifice ▲H Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
	47.0	8:55	561.010	0.40	0.90	0.90	47	49	5.0	94	250	268°F	250	5 min./point
00	44.8			0.50	1.13	1.13	59	49	6.0	94				
5	42.3			0.70	1.58	1.58	65	49	8.0	95				
10	39.5			0.70	1.58	1.58	70	50	8.0	95				
15	36.0			0.70	1.58	1.58	72	52	8.0	111				
20	30.9			0.70	1.58	1.58	74	54	8.0	103				
25	17.1			0.80	1.81	1.81	75	54	8.0	101				
30	12.0			1.20	2.73	2.73	79	55	5.0	97				
35	8.5			1.40	3.18	3.18	81	57	5.0	102				
40	5.7			1.40	3.18	3.18	82	59	5.0	102				
45	3.2			1.40	3.18	3.18	82	59	5.0	100				
50	1.0	9:55	609.324	1.00	2.27	2.27	82	60	4.0	101				
														Estimates:
														MW=28.8
														%H2O=2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.010
After	8.0	0.014

PITOT LEAK CHECK 15 sec

	Positive	Negative
Before	ok	ok
After	ok	ok

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL H_2O	550.9	557.0	-6.1
2.	100mL H_2O	558.4	548.5	9.9
3.	Empty	469.6	467.9	1.7
4.	Silica Gel	638.2	620.8	17.4
5.				

5.5g

total = 22.9g

AQE 6/92

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-18-92	ORIFICE CORRECTION (ΔH@) 1.985	HOT/COLD BOX NO. 5
TEST UNIT B-Battery PEC	TEST NO. CLR-M7-1	METER CORRECTION (Y) 0.9617	PROBE NO. 5-5
PROJECT NO. 300195T-01	NOZZLE (SIZE,#) 0.214 #54	CALIBRATION DATE 5-20-92	FILTER NO. 157
TEST CREW	STATIC PRESSURE 0.60	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.44	PORT DIRECTION East	CONTROL BOX NO. 6	PORT SIZE 4"

	Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
	47.0	~~1010~~	609.324	0.70	1.59	1.59	59	57	3.0	98	250	46°F	250	5 min./point
13	44.8	1010		0.80	1.82	1.82	71	55	3.5	95				
18	42.3			0.80	1.82	1.82	75	55	3.5	95				
23	39.5			0.80	1.82	1.82	77	55	3.5	94				
28	36.0			0.50	1.13	1.13	79	57	2.5	94				
33	30.9			0.50	1.13	1.13	79	59	2.5	104				
38	17.1			0.80	1.82	1.82	80	59	3.5	100				
43	12.0			1.20	2.74	2.74	82	59	4.8	111				
48	8.5			1.40	3.19	3.19	82	60	5.2	104				
53	5.7			1.40	3.19	3.19	82	59	5.0	100				
58	3.2			1.30	2.74	2.74	84	60	5.0	94				
03	1.0	~~1100~~	658.729	1.00	2.28	2.28	83	61	4.0	94				
		1110												
		Δ=120 min	Δ=97.719 dcf	$(\Delta P)_{AVG}$ = 0.90	$(\Delta H)_{AVG}$	=2.08	$(T_{meter})_{AVG}$	=66°F		$(T_{stack})_{AVG}$	=99°F			
														Estimates:
														MW=28.8
														%H2O=2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 8-24-93 (Tues)	ORIFICE CORRECTION (ΔH@) 1.802	HOT/COLD BOX NO. 8
TEST UNIT B-Battery Baghouse	TEST NO. CLR-M7-2	METER CORRECTION (Y) 0.969	PROBE NO. 5-3
PROJECT NO. 300195-01	NOZZLE (SIZE,#) 0.195	CALIBRATION DATE 5-17-93	FILTER NO. 1052
TEST CREW RC, TS	STATIC PRESSURE 0.2" H_2O	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.40	PORT DIRECTION NE	CONTROL BOX NO. 7	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1225	732.958	0.30	0.44	0.44	114	108	2.0	134	250	<68	250	5 min./point
44.8			0.30	0.44	0.44	130	109	2.0	132				
42.3			0.30	0.44	0.44	132	110	2.0	131				
39.5			0.30	0.44	0.44	135	110	2.0	135				
36.0			0.30	0.45	0.45	137	111	2.0	138				
30.9			0.30	0.45	0.45	136	111	2.0	134				
17.1			0.50	0.74	0.74	137	111	3.0	134				
12.0			0.70	1.04	1.04	139	112	4.0	134				
8.5			0.70	1.04	1.04	140	113	4.0	134				
5.7			0.70	1.04	1.04	140	113	4.0	132				
3.2			0.70	1.04	1.04	141	114	4.0	132				
1.0	1325	764.367	0.50	0.74	0.74	141	114	3.0	131				
													Estimates:
													MW= 28.952
													%H2O= 2

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.005
After	4.0	0.005

PITOT LEAK CHECK 15 sec

	Positive	Negative
Before	OK	OK
After	OK	OK

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL D.I. H_2O	573.4	556.5	16.9
2.	100 mL D.I. H_2O	569.2	565.1	4.1
3.	Empty	446.8	444.8	2.0
4.	Silica Gel	590.0	579.6	10.4
5.				
6.	Actual			37.4g
7.	Moisture = 2.8%			total
8.				

23.0g

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 8-24-93 (Tues.)	ORIFICE CORRECTION (ΔH@) 1.802	HOT/COLD BOX NO. 8
TEST UNIT B-Battery PEC	TEST NO. CLR-M7-2	METER CORRECTION (Y) 0.9619	PROBE NO. 5-3
PROJECT NO. 300757-01	NOZZLE (SIZE,#) 0.195	CALIBRATION DATE 5-17-93	FILTER NO. 1052
TEST CREW RC, JS	STATIC PRESSURE 0.2" H_2O	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.40	PORT DIRECTION SE	CONTROL BOX NO. 7	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1332	764.367	0.70	1.04	1.04	127	113	3.0	137	250	<68	250	5 min./point
44.8			0.80	1.19	1.19	138	113	3.5	132				
42.3			0.70	1.04	1.04	139	113	3.0	137				
39.5			0.70	1.04	1.04	140	114	3.0	135				
36.0			0.60	0.89	0.89	141	115	3.0	131				
30.9			0.60	0.90	0.90	141	115	3.0	130				
17.1			0.30	0.45	0.45	140	114	1.5	131				
12.0			0.30	0.45	0.45	139	113	1.5	129				
8.5			0.30	0.45	0.45	139	113	1.5	135				
5.7			0.30	0.45	0.45	138	113	1.5	131				
3.2			0.20	0.30	0.30	137	112	1.0	132				
1.0	1432	796.690	0.20	0.30	0.30	136	111	1.0	124				
Test Totals	Δ= 120 min	Δ= 63.732 dcf	$(\Delta p)_{AVG}$ = 0.50	$(\Delta H)_{AVG}$ =	0.70	$(T_{meter})_{AVG}$ = 124°F			$(T_{stack})_{AVG}$ = 133°F				Estimates: MW=28.9152
						velocity = 42.7 ft/sec			ISO. = 100.6%				%H2O= 2

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT	USS - Clairton Works	TEST DATE	08-24-93	ORIFICE CORRECTION (ΔH@) 2.002	HOT/COLD BOX NO. P-2
TEST UNIT	B Battery Baghouse	TEST NO.	CLR-MB-2	METER CORRECTION (Y) 0.9812	PROBE NO. 5-4
PROJECT NO.	300125-01	NOZZLE (SIZE,#)	0-181	CALIBRATION DATE 06-09-93	FILTER NO. 1067
TEST CREW	RPC	STATIC PRESSURE	+0.40" H_2O	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE	28.40	PORT DIRECTION	SE	CONTROL BOX NO. 5:1	PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.0	12:25	629.850	.80	.98	.98	98	94	1.0	128	250°F	68°F	250°F	5 min./point
44.0			.90	1.10	1.10	114	98	1.5	132				
42.3			1.0	1.22	1.22	115	98	2.5	128				
38.5			1.0	1.22	1.22	120	99	3.0	133				
36.0			1.0	1.22	1.22	124	102	3.0	134				
30.9			1.0	1.22	1.22	124	102	3.0	130				
17.1			.40	.49	.49	126	102	1.0	120				
12.0			.40	.49	.49	125	102	1.0	130				
8.5			.40	.49	.49	123	105	1.0	131				
5.7			.30	.37	.37	122	106	1.0	128				
3.2			.40	.49	.49	122	105	1.0	127				
1.0	13:25	660.852	.30	.37	.37	121	105	1.0	105				
													Estimates:
													MW= 28.854
													%H2O= 2

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.01cfm
After	6.0	<0.01cfm

PITOT LEAK CHECK

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

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL D.I. H_2O	547.1	531.8	15.3
2.	100mL D.I. H_2O	563.0	558.6	4.4
3.	Empty	451.4	449.1	2.3
4.	Silica Gel	654.5	644.9	9.6
5.				
6.	Actual			31.6g
7.	Moisture = 2.9%			total
8.				

22.0g

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS-Clairton Works	TEST DATE 8-24-93	ORIFICE CORRECTION (ΔH@) 2.002	HOT/COLD BOX NO. P. #2
TEST UNIT B Battery Baghouse	TEST NO. CLR-MB-2	METER CORRECTION (Y) 0.9812	PROBE NO. 5-4
PROJECT NO. 300195-01	NOZZLE (SIZE,#) 0.181	CALIBRATION DATE 6-9-93	FILTER NO. 1067
TEST CREW RPC	STATIC PRESSURE +0.40" H2O	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.40	PORT DIRECTION NE	CONTROL BOX NO. 51X	PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	13:30	660.852	.75	.92	.92	113	105	1.5	120	250°F	68°F Ice	250°F	5 min./point
44.8			.60	.73	.73	121	105	1.5	136				
42.3			.60	.73	.73	124	105	1.5	130				
39.5			.50	.61	.61	121	105	1.5	137				
36.0			.50	.61	.61	120	105	1.5	133				
30.9			.50	.61	.61	120	105	1.5	130				
17.1			.40	.49	.49	125	105	1.5	135				
12.0			.40	.49	.49	125	105	1.5	135				
8.5			.50	.61	.61	125	105	1.5	129				
5.7			.50	.61	.61	121	105	1.5	129				
3.2			.30	.37	.37	120	105	1.0	129				
1.0	14:30	686.865	.20	.24	.24	120	104	1.0	133				
Test Totals	Δ = 120 min	A = 57.015 dcf	$(\Delta P)_{AVG}$ = 0.55	$(\Delta H)_{AVG}$ =	0.70	$(T_{meter})_{AVG}$ = 112°F			$(T_{stack})_{AVG}$ = 129°F				Estimates: MW= 28.851 %H2O= 2
					velocity =	44.6 ft/sec			130. = 103.5%				

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

CHESTER ENVIRONMENTAL

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

1.0515

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (ΔH@) 1.535	HOT/COLD BOX NO. [redacted]3
TEST UNIT B-Battery PEC	TEST NO. CL12-N9[redacted]-1	METER CORRECTION (Y) ~~0.9916~~	PROBE NO. 5-[redacted]1
PROJECT NO. 300195.01	NOZZLE (SIZE,#) 0.234 #53	CALIBRATION DATE 9-14-92	FILTER NO. [redacted] QTZ 150
TEST CREW JPS	STATIC PRESSURE 0.25"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION ~~South~~ ~~East~~ South	CONTROL BOX NO. 7	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	0905	986.613	0.50	1.24	1.24	60	55	4.2	90	250	<68°F	250	5 min./point
44.8			0.50	1.24	1.24	78	57	4.2	90				
42.3			0.50	1.29	1.29	87	60	4.5	90				
39.5			0.60	1.57	1.57	93	62	5.0	90				
36.0			0.60	1.57	1.57	99	65	5.0	90				
30.9			0.60	1.57	1.57	103	69	5.2	90				
17.1			0.60	1.60	1.60	106	71	5.5	90				
12.0			0.65	1.73	1.73	109	74	6.0	90				
8.5			0.75	2.00	2.00	111	77	7.0	90				
5.7			0.85	2.26	2.26	113	80	7.5	90				
3.2			0.80	2.17	2.17	114	81	7.0	90				
1.0	1005	1029.544	0.10	0.27	0.27	114	82	1.0	90				
													Estimates:
													MW=28.8
													%H2O=2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.005
After	8.5	0.005

PITOT LEAK CHECK

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

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL H_2O	536.9	551.2	-14.3
2.	100 mL H_2O	569.0	558.8	10.2
3.	Empty	425.8	424.0	1.8
4.	Silica Gel	644.2	627.5	16.7
5.				

-2.3g

total = 14.4g

AQE 6/92

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (ΔH@) 1.535	HOT/COLD BOX NO. 3
TEST UNIT B-Battery PEC	TEST NO. CLR-M9 -1	METER CORRECTION (Y) ~~0.9916~~ 1.0515	PROBE NO. 5-1
PROJECT NO. 300195-101	NOZZLE (SIZE,#) 0.234 #53	CALIBRATION DATE 9-14-92	FILTER NO. 150 QTZ
TEST CREW JB	STATIC PRESSURE 0.25"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION ~~[illegible]~~ West	CONTROL BOX NO. 7	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1015	1029.544	0.60	1.55	1.55	89	78	5.0	95	250	<68°F	250	5 min./point
44.8			0.60	1.55	1.55	109	80	5.0	95				
42.3			0.60	1.61	1.61	113	82	5.0	95				
39.5			0.60	1.61	1.61	115	83	5.0	95				
36.0			0.60	1.61	1.61	117	84	5.0	95				
30.9			0.45	1.21	1.21	118	84	4.0	95				
17.1			0.60	1.61	1.61	120	86	5.0	95				
12.0			0.85	2.28	2.28	122	87	7.0	95				
8.5			1.00	2.69	2.69	122	88	8.5	95				
5.7			1.10	2.96	2.96	124	90	7.0	95				
3.2			1.00	2.69	2.69	124	90	6.2	95				
1.0	1115	1079.742	0.80	2.15	2.15	124	90	5.0	95				
	Δ=120 min	Δ=94.129 dcf	$(\Delta p)_{AVG}$ =	$(\Delta H)_{AVG}$	=1.75	$(T_{meter})_{AVG}$	=93°F		$(T_{stack})_{AVG}$	=93°F			
			0.65										Estimates:
													MW=28.8
													%H2O=2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

1.742

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (ΔH@) ~~1.724~~	HOT/COLD BOX NO. 1
TEST UNIT B-Battery PEC	TEST NO. CLR-M910-1	METER CORRECTION (Y) 1.0094	PROBE NO. 5-4
PROJECT NO. 300195-01	NOZZLE (SIZE,#) .217 #44	CALIBRATION DATE 11-12-92	FILTER NO. 146 QTZ
TEST CREW RPC, JS	STATIC PRESSURE 0.60"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.25	PORT DIRECTION West ~~[illegible]~~	CONTROL BOX NO. 3	PORT SIZE 4.0

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	10:15	~~1002.242~~	.60	1.30	1.30	77	68	4.0	90	250°C	68°F JECO Pore	250°C	5 min./point
44.8		100.242	0.60	1.30	1.30	86	70	4.5	90				
42.3			0.60	1.30	1.30	88	70	4.5	90				
39.5			0.70	1.52	1.52	90	71	5.5	90				
36.0			0.70	1.52	1.52	90	71	5.5	90				
30.9			0.50	1.09	1.09	90	72	4.0	90				
17.1			0.70	1.52	1.52	90	71	5.5	90				
12.0			0.80	1.74	1.74	92	72	6.5	90				
8.5			1.20	2.61	2.61	94	72	9.5	90				
5.7			1.40	3.04	3.04	94	73	10.0	90				
3.2			1.40	3.04	3.04	95	73	10.0	90				
1.0	11:15	~~147.246~~	1.20	2.61	2.61	94	73	8.0	90				
		147.746											
	Δ=120 min	Δ=93.559 dcf	$(\Delta P)_{AVG}$ =	$(\Delta H)_{AVG}$	=1.79	$(T_{meter})_{AVG}$	=78°F		$(T_{stack})_{AVG}$	=90°F			
			0.80										Estimates:
													MW= 28.8
													%H2O= 2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	.005
After	10.0	0.018

PITOT LEAK CHECK

	Positive	Negative
Before	0 15/15 sec	0 15/15 sec
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

1.742

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (ΔH@) ~~1.724~~	HOT/COLD BOX NO. 5
TEST UNIT B- Battery PEC	TEST NO. CLR-M11-1	METER CORRECTION (Y) 1.0094	PROBE NO. 5-4
PROJECT NO. 300196-01	NOZZLE (SIZE,#) ~~[illegible]~~ 44	CALIBRATION DATE 11-12-92	FILTER NO. 152 QTZ
TEST CREW JS	STATIC PRESSURE ~~0.27~~ 0.4"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION ~~East~~ West	CONTROL BOX NO. 3	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	~~14~~ 05	148.300	~~0.30~~ 0.43	0.92	0.92	68	59	~~2.0~~ 4.0	86	250	<68°F	250	5 min./point
44.8			0.30	0.64	0.64	75	62	3.0	87				
42.3			0.30	0.64	0.64	78	63	3.0	86				
39.5			0.30	0.64	0.64	80	65	3.0	86				
36.0			0.20	0.43	0.43	81	66	2.0	86				
30.9			0.20	0.43	0.43	81	67	2.0	87				
17.1			0.10	0.21	0.21	83	68	1.0	87				
12.0			0.20	0.43	0.43	82	69	2.0	88				
8.5			0.13	0.28	0.28	82	69	1.0	89				
5.7			0.11	0.24	0.24	82	69	1.0	89				
3.2			0.09	0.19	0.19	82	70	1.0	90				
1.0	1505	~~170.677~~	0.03	0.06	0.06	79	69	1.0	91				
		171.677											
													Estimates:
													MW= 28.8
													%H2O= 2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.006
After	5.0	0.010

PITOT LEAK CHECK

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

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100ml H_2O	559.2	559.5	-0.3
2.	100ml H_2O	551.6	550.9	0.7
3.	Empty	467.9	467.9	0.0
4.	Silica Gel	621.0	611.5	9.5
5.				

0.4g

total = 9.9g

AQE 6/92

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (ΔH@) ~~1.724~~ 1.742	HOT/COLD BOX NO. 5
TEST UNIT B Battery PCC	TEST NO. CLR-M11-1	METER CORRECTION (Y) 1.0074	PROBE NO. 5-4
PROJECT NO. 30019501	NOZZLE (SIZE,#) 0.217 #44	CALIBRATION DATE 11-12-92	FILTER NO. 152 QTZ
TEST CREW JB	STATIC PRESSURE 0.4"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION South	CONTROL BOX NO. 3	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1520	171.677	0.33	0.71	0.71	74	68	2.0	88	250	48°F	250	5 min./point
44.8			0.36	0.78	0.78	82	69	3.5	92				
42.3			0.35	0.76	0.76	84	69	3.5	91				
39.5			0.33	0.71	0.71	85	69	3.5	91				
36.0			0.27	0.58	0.58	85	69	3.0	91				
30.9			0.23	0.50	0.50	84	70	2.5	92				
17.1			0.10	0.22	0.22	83	70	1.0	94				
12.0			0.08	0.17	0.17	81	70	1.0	94				
8.5			0.10	0.22	0.22	81	69	1.0	94				
5.7			0.08	0.17	0.17	80	69	1.0	93				
3.2			0.055	0.12	0.12	80	69	1.0	90				
1.0	1620	195.005	0.075	0.16	0.16	79	69	1.0	90				
	Δ=120 min	Δ=46.705 dcf	$(\Delta P)_{AVG}$ = 0.18	$(\Delta H)_{AVG}$ =	0.43	$(T_{meter})_{AVG}$ = 74°F			$(T_{stack})_{AVG}$ = 90°F				
													Estimates:
													MW= 28.8
													%H2O=2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

Impinger No.	Impinger Contents	Final	Initial	Difference
1.		559.2	559.5	
2.		551.6	550.9	
3.		467.9	467.9	
4.		621.0	611.5	
5.				

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

1.0515

CLIENT USS Clairton Works	TEST DATE 11-17-92	ORIFICE CORRECTION (▲H@) 1.535	HOT/COLD BOX NO. 3
TEST UNIT B-Battery PEC	TEST NO. CLR-M12-1	METER CORRECTION (Y) ~~0.9946~~	PROBE NO. 5-1
PROJECT NO. 3001~~9650~~1	NOZZLE (SIZE,#) 0.234 #53	CALIBRATION DATE 9-14-92	FILTER NO. 153 QTZ
TEST CREW JPS	STATIC PRESSURE 0.05"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.24	PORT DIRECTION ~~South~~ West	CONTROL BOX NO. 7	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ▲P (in. H2O)	Orifice ▲H Required (in. H20)	Orifice ▲H Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1405	080.065	0.05	0.13	0.13	62	58	1.0	85	250	<68°F	250	5 min./point
44.8			0.05	0.13	0.13	80	60	1.0	87				
42.3			0.05	0.13	0.13	88	63	1.0	90				
39.5			0.05	0.13	0.13	88	66	1.0	90				
36.0			0.10	0.26	0.26	96	68	1.0	88				
30.9			0.10	0.26	0.26	102	70	1.0	90				
17.1			0.20	0.52	0.52	107	74	1.5	90				
12.0			0.25	0.65	0.65	110	76	2.0	92				
8.5			0.25	0.67	0.67	114	79	2.0	92				
5.7			0.25	0.67	0.67	116	82	2.0	91				
3.2			0.25	0.68	0.68	118	83	2.0	91				
1.0	1505	~~[illegible]~~	0.25	0.68	0.68	120	85	2.0	92				
		101,060											
													Estimates:
													MW= 28.8
													%H2O=2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.010
After	~~3.0~~ 5.0	~~[illegible]~~ 0.005

PITOT LEAK CHECK

	Positive	Negative
Before	OK 15sec	OK 15sec
After		

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 ml H_2O	551.0	549.9	1.1
2.	100 ml H_2O	559.4	559.4	0.0
3.	Empty	424.5	424.4	0.1
4.	Silica Gel	656.1	647.6	8.5
5.				

1.2g

total = 9.7g

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT	USS Clairton Works	TEST DATE	11-17-92	ORIFICE CORRECTION (▲H@)	1.535 / 1.0575
TEST UNIT	B-Battery PEC	TEST NO.	C12-M12-1	METER CORRECTION (Y)	~~0.9916~~
PROJECT NO.	300195-01	NOZZLE (SIZE,#)	0.234 #53	CALIBRATION DATE	9-14-92
TEST CREW	JB	STATIC PRESSURE	0.05"	PITOT CORRECTION	0.84
BAROMETRIC PRESSURE	29.24	PORT DIRECTION	~~North~~ South	CONTROL BOX NO.	7

HOT/COLD BOX NO.	3
PROBE NO.	5-1
FILTER NO.	153 QTZ
STACK DIA.	48"
PORT SIZE	4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ▲P (in. H2O)	Orifice ▲H Required (in. H20)	Orifice ▲H Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1620	101.060	0.10	0.25	0.25	62	58	1.0	90	250	<68°F=	250	5 min./point
44.8			0.15	0.38	0.38	80	60	1.0	90				
42.3			0.15	0.38	0.38	90	62	1.0	91				electrical
39.5			0.15	0.39	0.39	97	68	1.0	91				problems-
36.0			0.15	0.39	0.39	101	70	1.0	91				delay
30.9			0.15	0.39	0.39	103	72	1.0	93				starting
17.1			0.15	0.39	0.39	108	74	1.0	93				
12.0			0.15	0.40	0.40	110	76	1.0	94				
8.5			0.15	0.40	0.40	110	78	1.2	94				
5.7			0.10	0.27	0.27	111	80	1.0	90				
3.2			0.10	0.27	0.27	113	82	1.0	92				
1.0	1720	122.560	0.10	0.27	0.27	115	83	1.0	92				
	Δ=120 min	Δ=42.495 dcf	$(\Delta P)_{AVG}$ = 0.14	$(\Delta H)_{AVG}$ =	0.38	$(T_{meter})_{AVG}$ = 86°F			$(T_{stack})_{AVG}$ = 91°F				
													Estimates:
													MW=
													%H2O=

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

1.0515

CLIENT USS Clairton Works	TEST DATE 1-18-92	ORIFICE CORRECTION (ΔH@) 1.535	HOT/COLD BOX NO. 2
TEST UNIT B-Battery PEC	TEST NO. CLR-~~[illegible]~~-1 M13	METER CORRECTION (Y) 0.9916	PROBE NO. 54
PROJECT NO. 300195-01	NOZZLE (SIZE,#) 0.274 #53	CALIBRATION DATE 9-14-92	FILTER NO. 156
TEST CREW RPC, JS, JS, TM	STATIC PRESSURE 0.50"	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.44	PORT DIRECTION South	CONTROL BOX NO. 7	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	0855	124.325	.25	.63	.63	51	50	1.5	89	250	<68°F	250	5 min./point
44.8			.20	.50	.50	69	53	1.0	98				
42.3			.30	.76	.76	75	56	1.5	93				
39.5			.20	.50	.50	85	60	1.0	95				
36.0			.25	.63	.63	90	63	1.5	101				
30.9			.30	.76	.76	99	69	1.5	100				
17.1			.50	1.26	1.26	101	70	3.0	98				
12.0			.70	1.76	1.76	105	75	4.0	98				
8.5			.75	1.89	1.89	110	76	4.0	97				
5.7			.80	2.02	2.02	116	79	4.0	95				
3.2			.95	2.39	2.39	120	81	5.0	91				
1.0	0955	162.107	.75	1.89	1.89	120	83	4.5	101				
													Estimates:
													MW=28.8
													%H2O=2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.009 cfm
After	5.5	.008 cfm

PITOT LEAK CHECK

	Positive	Negative
Before	0°F/15sec	0°F/15sec
After	0°F/15sec	0°F/15sec

GAS	1	2
CO2	0	
O2	20.7	
CO	0%	
N2	79.3	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL H_2O	472.8	476.5	-3.7
2.	100mL H_2O	367.0	360.9	6.1
3.	Empty	451.3	449.7	1.6
4.	Silica Gel	664.3	649.7	14.6
5.				

4.0g

total = 18.6g

AQE 6/92

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

1.0575

CLIENT	USS Clairton Works	TEST DATE	11-18-92	ORIFICE CORRECTION (ΔH@)	1.535
TEST UNIT	8-Battery PEC	TEST NO.	CLR-~~M14~~-1 M13	METER CORRECTION (Y)	~~0.9916~~
PROJECT NO.	300195/01	NOZZLE (SIZE,#)	0.234 #53	CALIBRATION DATE	9-14-92
TEST CREW	RPC, JS, JS, TM	STATIC PRESSURE	0 -.50"	PITOT CORRECTION	0.84
BAROMETRIC PRESSURE	29.44	PORT DIRECTION	West	CONTROL BOX NO.	7

HOT/COLD BOX NO. 2
PROBE NO. 5-4
FILTER NO. 156
STACK DIA. 48"
PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	10:10	162.107	.50	1.31	1.31	80	77	3.0	91	250	<68°F	250	5 min./point
44.8			.45	1.18	1.18	100	80	2.5	95				
42.3			.25	.65	.65	107	81	1.0	90				
39.5			.50	1.31	1.31	111	82	2.0	89				
36.0			.50	1.31	1.31	120	83	2.0	87				
30.9			.50	1.31	1.31	120	83	2.0	87				
17.1			.45	1.18	1.18	121	84	2.0	95				
12.0			.40	1.05	1.05	121	84	1.5	102				
8.5			.52	1.36	1.36	121	85	2.0	96				
5.7			.50	1.31	1.31	122	87	2.0	94				
3.2			.75	1.96	1.96	121	87	3.0	90				
1.0	11:10	202.360	.60	1.57	1.57	122	90	3.0	95				
	Δ=120 min	Δ=78.035 dcf	$(\Delta P)_{AVG}$ = 0.45	$(\Delta H)_{AVG}$ = 1.20		$(T_{meter})_{AVG}$ = 90°F			$(T_{stack})_{AVG}$ = 94°F				
													Estimates:
													MW= 28.8
													%H2O= 2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

1.742

CLIENT USS Clairton Works	TEST DATE 11-18-92	ORIFICE CORRECTION (ΔH@) ~~1.724~~	HOT/COLD BOX NO. 3
TEST UNIT B - Battery Pec	TEST NO. CLR - ~~[illegible]~~ -1 M14	METER CORRECTION (Y) 1.0094	PROBE NO. ~~[illegible]~~ 5-1
PROJECT NO. 300195-61	NOZZLE (SIZE,#) 0.217 #44	CALIBRATION DATE 11-12-92	FILTER NO. 153
TEST CREW RPC, JS, JS, TM	STATIC PRESSURE 0.6	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.44	PORT DIRECTION South	CONTROL BOX NO. 3	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	0855	195.238	0.20	0.42	0.42	56	54	1.0	93	250	<68°F	250	5 min./point
44.8			0.19	0.40	0.40	69	58	1.0	96				
42.3			0.17	0.36	0.36	72	59	1.0	96				
39.5			0.15	0.31	0.31	74	61	0.0	94				
36.0			0.14	0.29	0.29	75	62	0.0	102				
30.9			0.16	0.34	0.34	76	62	0.0	101				
17.1			0.29	0.61	0.61	78	63	2.0	98				
12.0			0.35	0.73	0.73	78	64	2.5	95				
8.5			0.37	0.77	0.77	78	64	2.5	96				
5.7			0.40	0.84	0.84	77	65	3.0	99				
3.2			0.35	0.73	0.73	74	65	2.5	96				
1.0	0955	222.737	0.28	0.59	0.59	78	65	2.0	104				
													Estimates:
													MW= 28.8
													%H2O=2%

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.011 cfm
After	5.0	.011 cfm

PITOT LEAK CHECK

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

GAS	1	2
CO2	0	
O2	20.5	
CO	0	
N2	79.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL H_2O	550.9	551.9	-1.0
2.	100 mL H_2O	559.8	557.1	2.7
3.	Empty	425.0	424.6	0.4
4.	Silica Gel	661.7	651.9	9.8
5.				

2.1g

total = 11.9g

AQE 6/92

KEYSTONE ENVIRONMENTAL RESOURCES / AIR QUALITY ENGINEERING
STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works	TEST DATE 11-18-92	ORIFICE CORRECTION (ΔH@) ~~1.724~~ 1.742	HOT/COLD BOX NO. 3
TEST UNIT B-Battery PEC	TEST NO. CLR-~~[illegible]~~-1 M14	METER CORRECTION (Y) 1.0094	PROBE NO. ~~[illegible]~~ 5-1
PROJECT NO. 30095-01	NOZZLE (SIZE,#) 0.217 #4/4	CALIBRATION DATE 11-12-92	FILTER NO. 158
TEST CREW RPC, JS, JS, TM	STATIC PRESSURE 0.2	PITOT CORRECTION 0.84	STACK DIA. 48"
BAROMETRIC PRESSURE 29.44	PORT DIRECTION West	CONTROL BOX NO. 3	PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
47.0	1010	222.737	0.12	0.26	0.26	68	63	0.0	95	250	68°F	250	5 min./point
44.8			0.14	0.30	0.30	70	65	0.0	94				
42.3			0.18	0.39	0.39	76	65	0.0	94				
39.5			0.70	1.51	1.51	82	65	4.5	93				
36.0			0.60	1.29	1.29	85	66	4.5	92				
30.9			0.40	0.86	0.86	83	67	3.0	98				
17.1			0.14	0.30	0.30	81	67	0.0	97				
12.0			0.09	0.19	0.19	79	67	0.0	104				
8.5			0.07	0.15	0.15	78	67	0.0	104				
5.7			0.06	0.13	0.13	77	67	0.0	99				
3.2			0.05	0.11	0.11	77	67	0.0	96				
1.0	1110	246.052	0.06	0.13	0.13	77	67	0.0	95				
	Δ=120 min	Δ=50.814 dcf	$(\Delta P)_{AG}$ = 0.21	$(\Delta H)_{AG}$ =	0.50	$(T_{meter})_{AG}$ = 70°F			$(T_{stack})_{AG}$ = 97°F				
													Estimates:
													MW= 28.8
													%H2O= 2%

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 3 BP 28.35 in. Hg
DATE 11-12-92 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT	ORIFICE COEFFICIENT
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	Y	ΔH@
START			0.000	28.35				0.50	36.400		
HALF		72.0			102.0	88.0	95.0				
STOP	12.58		5.000						41.600		
CALCULATION	12.58	532.0	5.013	28.35			555.0	28.39	5.200	1.0043	1.796
START			0.000	28.35				1.00	42.200		
HALF		72.0			105.0	89.0	97.0				
STOP	8.68		5.000						47.379		
CALCULATION	8.68	532.0	5.013	28.35			557.0	28.42	5.179	1.0107	1.704
START			0.000	28.35				2.00	48.100		
HALF		72.0			111.0	90.0	100.5				
STOP	6.20		5.000						53.286		
CALCULATION	6.20	532.0	5.013	28.35			560.5	28.50	5.186	1.0131	1.728
AVERAGE										1.0094	1.742

POST TEST

BOX # 3 BP 28.90 in. Hg
DATE 01-05-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT	ORIFICE COEFFICIENT
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	Y	ΔH@
START			0.000	28.90				1.25	126.900		
HALF		70.0			101.0	89.0	95.0				
STOP	7.70		5.000						131.974		
CALCULATION	7.70	530.0	5.013	28.90			555.0	28.99	5.074	1.0312	1.638
START			0.000	28.90				1.25	132.300		
HALF		70.0			104.0	90.0	97.0				
STOP	7.70		5.000						137.421		
CALCULATION	7.70	530.0	5.013	28.90			557.0	28.99	5.121	1.0254	1.632
START			0.000	28.90				1.25	137.800		
HALF		70.0			105.0	90.0	97.5				
STOP	7.78		5.000						142.930		
CALCULATION	7.78	530.0	5.013	28.90			557.5	28.99	5.130	1.0245	1.664
AVERAGE										1.0270	1.645
DIFFERENCE										-1.7%	6.0%

PRE-TEST MAGNEHELIC CALIBRATION

BOX# 3
DATE 11-12-92
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

MAGNEHELIC Δ P	MANOMETER
0.50	0.48
0.40	0.40
0.30	0.30
0.20	0.20
0.10	0.10

0 to 5" H2O RANGE

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

PRE-TEST LEAK CHECK

DATE 11-12-92
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	17.430	17.612	0.182	10.000	-0.000
WET	0.000	0.180	0.180		

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

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

PRE-TEST PYROMETER CHECK

DATE 11-12-92
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	41.0
0.40	50	51.0
0.84	70	71.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	202.0
6.09	300	302.0
8.31	400	404.0
10.57	500	504.0

POST-TEST MAGNEHELIC CALIBRATION

BOX# 3
DATE 01-05-93
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

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

0 to 5" H2O RANGE

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

POST-TEST LEAK CHECK

DATE 01-05-93
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	125.610	125.856	0.246	10.000	-0.0004
WET	0.000	0.242	0.242		

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

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

POST-TEST PYROMETER CHECK

DATE 01-07-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	39.0
0.40	50	49.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	300.0
8.31	400	400.0
10.57	500	500.0

QA ORIFICE AUDIT

ORIFICE	BAPC-3	DATE	11-12-92	B.P.	28.80
OPERATOR	RPC	BOX #	3		

RUN	1		2		3	
INITIAL CF	519.800		527.600		535.500	
FINAL CF	527.396		535.160		543.036	
DIFFERENCE	7.596		7.560		7.536	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	80	79	79	79	81	79
TEMP 5 MIN	80	79	80	79	81	78
TEMP 10 MIN	79	79	80	79	81	79
TEMP 15 MIN	79	79	81	79	81	79
		TEMP R		TEMP R		TEMP R
TEMP AVG	79.25	539.25	79.5	539.5	79.875	539.875
TIME (MIN.)	15.00		15.00		15.00	
	IN WATE	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.71	0.05	0.71	0.05	0.71	0.05
METER PRESSURE		28.85		28.85		28.85
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	75.0	23.9	75.0	23.9	75.0	23.9
VACUUM IN HG	19.0		19.0		19.0	
DGM CAL Y	1.0094		1.0094		1.0094	
STD CF	7.267		7.229		7.201	
STD CUBIC METERS	0.2058		0.2047		0.2039	

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 4 BP 28.9 in. Hg
DATE 06-03-92 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT Y	ORIFICE COEFFICIENT ΔH@
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD		
START			0.000	28.90				0.50	525.800		
HALF		73.0			93.0	89.0	91.0				
STOP	12.17		5.000						531.165		
CALCULATION	12.17	533.0	5.013	28.90			551.0	28.94	5.365	0.9646	1.667
START			0.000	28.90				1.00	531.500		
HALF		73.0			94.0	90.0	92.0				
STOP	8.85		5.000						536.800		
CALCULATION	8.85	533.0	5.013	28.90			552.0	28.97	5.300	0.9770	1.760
START			0.000	28.90				2.00	537.600		
HALF		73.0			94.0	90.0	92.0				
STOP	6.40		5.000						542.899		
CALCULATION	6.40	533.0	5.013	28.90			552.0	29.05	5.299	0.9747	1.841
AVERAGE										0.9721	1.756

POST TEST

BOX # 4 BP 29.05 in. Hg
DATE 01-07-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT Y	ORIFICE COEFFICIENT ΔH@
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD		
START			0.000	29.05				1.00	494.100		
HALF		70.0			77.0	76.0	76.5				
STOP	8.63		5.000						499.250		
CALCULATION	8.63	530.0	5.013	29.05			536.5	29.12	5.150	0.9828	1.694
START			0.000	29.05				1.00	499.600		
HALF		70.0			80.0	79.0	79.5				
STOP	8.65		5.000						504.766		
CALCULATION	8.65	530.0	5.013	29.05			539.5	29.12	5.166	0.9852	1.692
START			0.000	29.05				1.00	505.100		
HALF		70.0			83.0	81.0	82.0				
STOP	8.61		5.000						510.247		
CALCULATION	8.61	530.0	5.013	29.05			542.0	29.12	5.147	0.9934	1.669
AVERAGE										0.9871	1.685
DIFFERENCE										-1.5%	4.2%

PRE-TEST MAGNEHELIC CALIBRATION

BOX# 4
DATE 06-03-92
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

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

0 to 5" H2O RANGE

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

PRE-TEST LEAK CHECK

DATE 06-03-92
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	508.320	508.433	0.113	10.000	-0.000
WET	0.000	0.111	0.111		

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

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

PRE-TEST PYROMETER CHECK

DATE 06-03-92
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	69.0
1.29	90	90.0
1.74	110	109.0
2.66	150	150.0
3.82	200	200.0
6.09	300	300.0
8.31	400	400.0
10.57	500	500.0

POST-TEST MAGNEHELIC CALIBRATION

BOX# 4
DATE 01-07-93
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

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

0 to 5" H2O RANGE

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

POST-TEST LEAK CHECK

DATE 01-07-93
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	493.445	493.574	0.129	10.000	-0.0008
WET	0.000	0.121	0.121		

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

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

POST-TEST PYROMETER CHECK

DATE 01-07-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	41.0
0.40	50	51.0
0.84	70	70.0
1.29	90	91.0
1.74	110	111.0
2.66	150	151.0
3.82	200	201.0
6.09	300	301.0
8.31	400	402.0
10.57	500	502.0

QA ORIFICE AUDIT

ORIFICE	BAPC-3	DATE	12-07-92	B.P.	28.85
OPERATOR	RPC	BOX #	4		

RUN	1		2		3	
INITIAL CF	483.900		496.500		504.600	
FINAL CF	491.400		504.010		512.121	
DIFFERENCE	7.500		7.510		7.521	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	71	69	78	75	82	80
TEMP 5 MIN	74	73	78	77	83	80
TEMP 10 MIN	75	74	80	78	85	81
TEMP 15 MIN	78	76	81	79	85	83
		TEMP R		TEMP R		TEMP R
TEMP AVG	73.75	533.75	78.25	538.25	82.375	542.375
TIME (MIN.)	15.00		15.00		15.00	
	N WATE	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.65	0.05	0.65	0.05	0.65	0.05
METER PRESSURE		28.90		28.90		28.90
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	75.0	23.9	75.0	23.9	75.0	23.9
VACUUM IN HG	19.0		19.0		19.0	
DGM CAL Y	0.9721		0.9721		0.9721	
STD CF	6.992		6.943		6.900	
STD CUBIC METERS	0.1980		0.1966		0.1954	

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 6 BP 29.2 in. Hg
DATE 05-20-92 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT	ORIFICE COEFFICIENT
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	Y	ΔH@
START			0.000	29.20				0.50	777.500		
HALF		72.0			94.0	83.0	88.5				
STOP	13.40		5.000						782.822		
CALCULATION	13.40	532.0	5.013	29.20			548.5	29.24	5.322	0.9698	2.002
START			0.000	29.20				1.00	783.500		
HALF		72.0			96.0	85.0	90.5				
STOP	9.46		5.000						788.954		
CALCULATION	9.46	532.0	5.013	29.20			550.5	29.27	5.454	0.9486	1.988
START			0.000	29.20				2.00	789.800		
HALF		72.0			109.0	89.0	99.0				
STOP	6.70		5.000						795.222		
CALCULATION	6.70	532.0	5.013	29.20			559.0	29.35	5.422	0.9665	1.964
AVERAGE										0.9617	1.985

POST TEST

BOX # 6 BP 29.05 in. Hg
DATE 01-07-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT	ORIFICE COEFFICIENT
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	Y	ΔH@
START			0.000	29.05				1.00	842.200		
HALF		70.0			100.0	75.0	87.5				
STOP	9.33		5.000						847.296		
CALCULATION	9.33	530.0	5.013	29.05			547.5	29.12	5.096	1.0135	1.940
START			0.000	29.05				1.00	847.500		
HALF		70.0			101.0	79.0	90.0				
STOP	9.35		5.000						852.600		
CALCULATION	9.35	530.0	5.013	29.05			550.0	29.12	5.100	1.0174	1.939
START			0.000	29.05				1.00	852.950		
HALF		70.0			103.0	81.0	92.0				
STOP	9.35		5.000						858.040		
CALCULATION	9.35	530.0	5.013	29.05			552.0	29.12	5.090	1.0231	1.932
AVERAGE										1.0180	1.937
DIFFERENCE										-5.5%	2.5%

PRE-TEST MAGNEHELIC CALIBRATION

BOX# 6
DATE 05-20-92
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

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

Calibration not necessary.
Primary standard on control box.

0 to 5" H2O RANGE

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

PRE-TEST LEAK CHECK

DATE 05-20-92
OPERATOR RPC

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

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

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

PRE-TEST PYROMETER CHECK

DATE 05-20-92
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	41.0
0.40	50	51.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	300.0
8.31	400	399.0
10.57	500	500.0

POST-TEST MAGNEHELIC CALIBRATION

BOX# 6
DATE 01-07-93
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

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

Calibration not necessary.
Primary standard on control box.

0 to 5" H2O RANGE

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

POST-TEST LEAK CHECK

DATE 01-07-93
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	841.100	841.349	0.249	10.000	0.0001
WET	0.000	0.250	0.250		

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

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

POST-TEST PYROMETER CHECK

DATE 01-07-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	300.0
8.31	400	401.0
10.57	500	501.0

QA ORIFICE AUDIT

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

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

CONTROL BOX CALIBRATION

METERING SYSTEM THREE POINT CALIBRATION

CONTROL BOX NO. 7 BAROMETRIC PRESSURE 29.10 in. Hg
CALIBRATION DATE 9-14-92 OPERATOR TJM

	WET TEST METER				DRY TEST METER						
	ELAPSED TIME (min)	METER TEMP Tw (°F/°R)	VOLUME Vw (CF)	METER PRESSURE Pw (in. Hg)	TEMP IN Ti (°F)	TEMP OUT To (°F)	AVERAGE TEMP Ta (°F/°R)	ORIFICE PRESSURE DIFFERENTIAL ΔH (in. H2O/in. Hg)	VOLUME Vd (DCF)	METER COEFFICIENT Y	ORIFICE COEFFICIENT ΔH@
START			0.000	29.10				0.50	837.072		
MIDWAY		70			108	84	96				
STOP	11.55		5.000						841.999		
CALCULATION	11.55	530	5.013	29.10			556	29.14	4.927	1.0659	1.461
START			0.000	29.10				1.00	842.750		
MIDWAY		82			108	85	97				
STOP	8.23		5.000						847.678		
CALCULATION	8.23	542	5.013	29.10			557	29.17	4.928	1.0417	1.550
START			0.000	29.10				2.00	851.820		
MIDWAY		82			115	85	100				
STOP	5.92		5.000						856.742		
CALCULATION	5.92	542	5.013	29.10			560	29.25	4.922	1.0469	1.594
AVERAGE										1.0515	1.535

METERING SYSTEM POST-TEST CALIBRATION

CONTROL BOX NO. 7 BAROMETRIC PRESSURE 28.95 in. Hg
CALIBRATION DATE 01-08-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER						
	ELAPSED TIME (min)	METER TEMP Tw (°F/°R)	VOLUME Vw (CF)	METER PRESSURE Pw (in. Hg)	TEMP IN Ti (°F)	TEMP OUT To (°F)	AVERAGE TEMP Ta (°F/°R)	ORIFICE PRESSURE DIFFERENTIAL ΔH (in. H2O/in. Hg)	VOLUME Vd (DCF)	METER COEFFICIENT Y	ORIFICE COEFFICIENT ΔH@
START			0.000	28.95				1.00	430.300		
MIDWAY		70			103	79	91				
STOP	8.75		5.000						435.480		
CALCULATION	8.75	530	5.013	28.95			551	29.02	5.180	1.0035	1.701
START			0.000	28.95				1.00	435.700		
MIDWAY		82			108	81	95				
STOP	8.78		5.000						440.909		
CALCULATION	8.78	542	5.013	28.95			555	29.02	5.209	0.9820	1.780
START			0.000	28.95				1.00	441.300		
MIDWAY		82			110	84	97				
STOP	8.75		5.000						446.491		
CALCULATION	8.75	542	5.013	28.95			557	29.02	5.191	0.9898	1.760
AVERAGE										0.9918	1.747
DIFFERENCE										6.03%	-12.12%

PRE-TEST MAGNEHELIC CALIBRATION

CONTROL BOX 7
DATE 9-14-92
OPERATOR TJM

0 to 2.0" H2O RANGE

MAGNEHELIC Δ P (in. H2O)	MANOMETER (in. H2O)
0.50	0.50
0.75	0.75
1.00	1.00
1.50	1.50
2.00	2.00

0 to 0.50" H2O RANGE

MAGNEHELIC Δ P (in. H2O)	MANOMETER (in. H2O)
0.50	0.48
0.40	0.40
0.30	0.28
0.20	0.19
0.10	0.10

0 to 3.0" H2O RANGE

MAGNEHELIC Δ H (in. H2O)	MANOMETER (in. H2O)
3.00	2.90
2.00	1.90
1.00	0.97
0.50	0.49

PRE-TEST METERING SYSTEM LEAK CHECK

DATE 9-14-92
OPERATOR TJM

METER	INITIAL VOLUME (CF)	FINAL VOLUME (CF)	VOLUME DIFF. (CF)	ELAPSED TIME (min)	LEAK RATE (CFM)
DRY	831.640	831.809	0.169	10.00	0.0031
WET	0.000	0.200	0.200		

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°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	301
8.31	400	400
10.57	500	500

PRE-TEST PYROMETER CALIBRATION

DATE 9-14-92
OPERATOR MG

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40
0.40	50	50
0.84	70	69
1.29	90	89
1.74	110	109
2.66	150	149
3.82	200	200
6.09	300	300
8.31	400	398
10.57	500	498

POST-TEST MAGNEHELIC CALIBRATION

CONTROL BOX 7
DATE 01-08-93
OPERATOR RPC

0 to 10" H2O RANGE

MAGNEHELIC Δ P (in. H2O)	MANOMETER (in. H2O)
0.50	0.50
0.75	0.75
1.00	1.00
1.50	1.50
2.00	2.00

0 to 0.50" H2O RANGE

MAGNEHELIC Δ P (in. H2O)	MANOMETER (in. H2O)
0.50	0.50
0.40	0.40
0.30	0.30
0.20	0.20
0.10	0.10

0 to 3.0" H2O RANGE

MAGNEHELIC Δ H (in. H2O)	MANOMETER (in. H2O)
3.00	3.00
2.00	2.00
1.00	1.00
0.50	0.50

POST-TEST METERING SYSTEM LEAK CHECK

DATE 01-08-93
OPERATOR RPC

METER	INITIAL VOLUME (CF)	FINAL VOLUME (CF)	VOLUME DIFF. (CF)	ELAPSED TIME (min)	LEAK RATE (CFM)
DRY	429.340	429.639	0.299	10.00	-0.0135
WET	0.000	0.164	0.164		

PYROMETER CALIBRATION

DATE 04-28-88
OPERATOR AGL

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°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	301
8.31	400	400
10.57	500	500

POST-TEST PYROMETER CALIBRATION

DATE 01-08-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	39
0.40	50	50
0.84	70	70
1.29	90	89
1.74	110	109
2.66	150	149
3.82	200	199
6.09	300	299
8.31	400	398
10.57	500	499

QA ORIFICE AUDIT

ORIFICE	BAPC-3	DATE	10-27-92	B.P.	28.80
OPERATOR	RPC	BOX #	7		

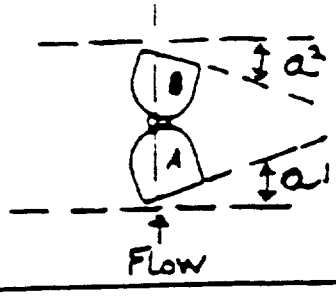
RUN	1		2		3	
INITIAL CF	791.800		799.400		807.100	
FINAL CF	799.222		806.850		814.566	
DIFFERENCE	7.422		7.450		7.466	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	78	73	81	75	85	78
TEMP 5 MIN	79	74	83	76	86	78
TEMP 10 MIN	80	75	84	76	87	78
TEMP 15 MIN	80	75	85	78	88	79
		TEMP R		TEMP R		TEMP R
TEMP AVG	76.75	536.75	79.75	539.75	82.375	542.375
TIME MINUTES	15.00		15.00		15.00	
	IN WATER	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.65	0.05	0.65	0.05	0.65	0.05
METER PRESSURE		28.85		28.85		28.85
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	75.0	23.9	75.0	23.9	75.0	23.9
VACUUM IN HG	18.0		18.0		18.0	
DGM CAL Y	1.0515		1.0515		1.0515	
STD CF	7.430		7.417		7.396	
STD CUBIC METERS	0.2104		0.2100		0.2095	

GEOMETRIC PITOT CALIBRATION

Caliper # XCF-59
Precheck ✓
Post Check

Probe #: J-1
Date: 11-2-92
Initials: [illegible]

①

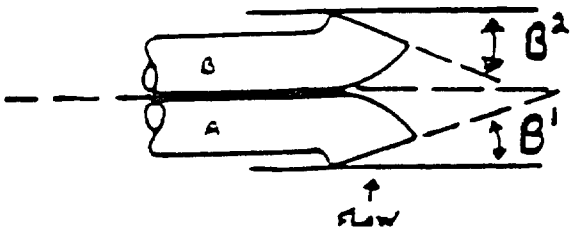


a^1 = 3.0°
a^2 = 4.0°
a^1, a^2 = <10°

B^1 = 2.5°
B^2 = 3.0°
B^1, B^2, = <5°

F = 1.025"

②



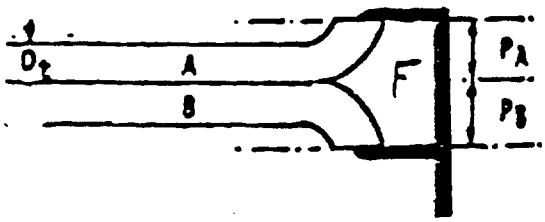
μ = 0.0241 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0.0241 — V = ≤0.03125" (V = F TAN θ)

W = 0.528 — W ≥ 0"

X = 0.786 — X ≥ 0.750" (3/4" using 1/2" nozzle)

③



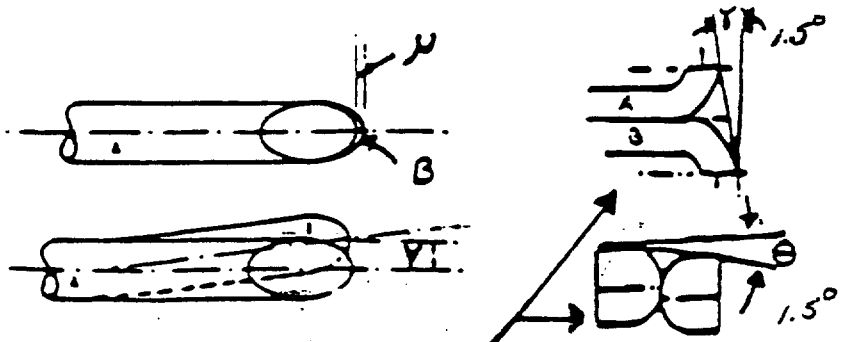
1.05 D_t < A < 1.50 D_t
$P_A = P_B$
2.10 D_t < A < 3.00 D_t

Y = 5.946 — Y ≥ 3.0"

Z = 3.372 — Z > 2.0"

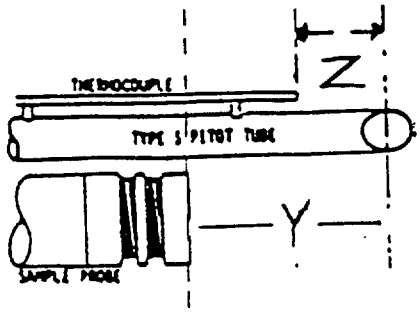
D_t = 0.375 — D_t > .1875" to .375" (3/16" to 3/8")

④



(γ, θ EXPRESSED IN DEGREES)

⑥



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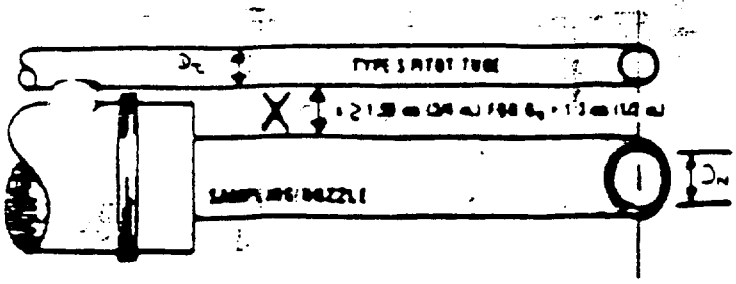

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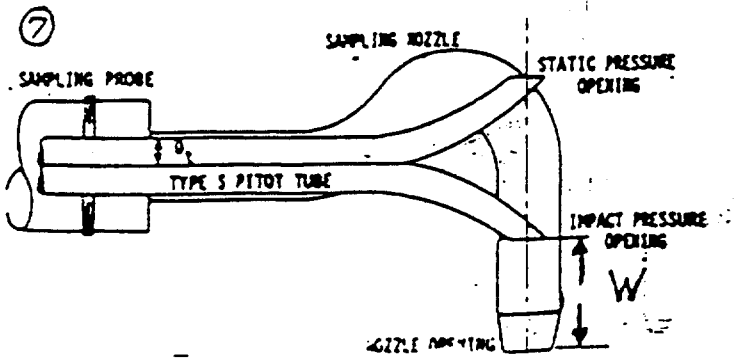
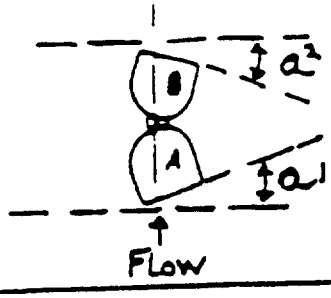


GEOMETRIC PITOT CALIBRATION

Caliper # XFS-68
Precheck
Post Check ✓

Probe #: 5-1
Date: 12-11-93
Initials: TM

①



a^1 = 2.0
a^2 = 4.0

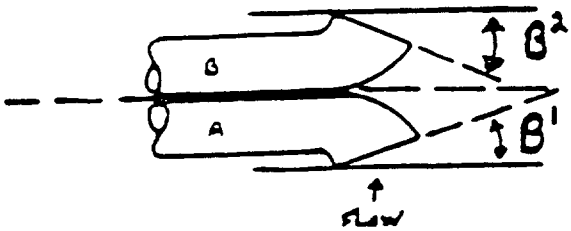
$a^1, a^2 = <10°$

B^1 = 3.0
B^2 = 3.0

$B^1, B^2, = <5°$

F = 1.028"

②



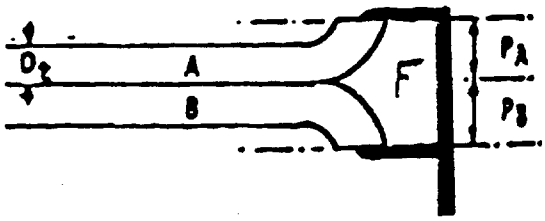
μ = 0.0179 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0.0179 — V = ≤0.03125" (V = F TAN θ)

W = 0.361 — W ≥ 0"

X = .800 — X ≥ 0.750" (3/4" using 1/2" nozzle)

③



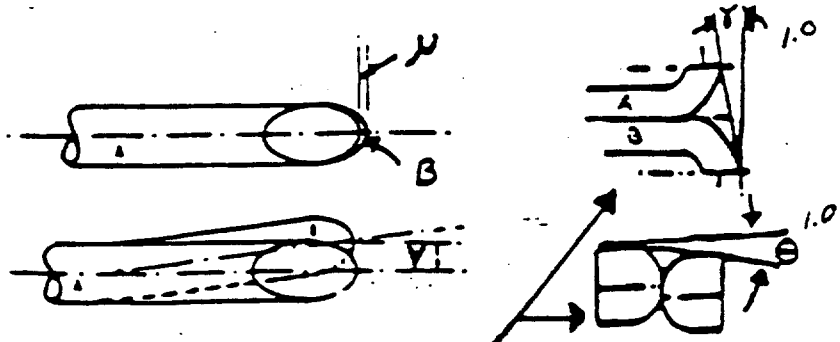
1.05 D_t < B < 1.50 D_t
$P_A = P_B$
2.10 D_t < A < 3.00 D_t

Y = 6.184 — Y ≥ 3.0"

Z = 3.168 — Z > 2.0"

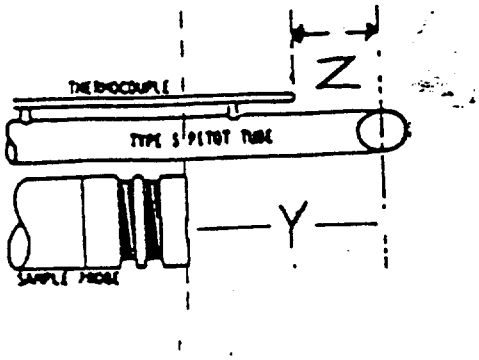
D_t = 0.375 — D_t > .1875" to .375" (3/16" to 3/8")

④



(γ, θ EXPRESSED IN DEGREES)

⑥



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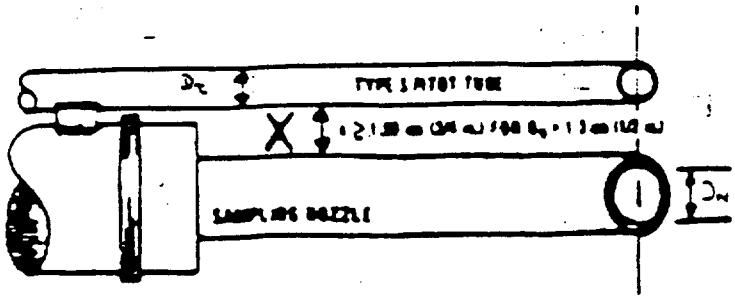

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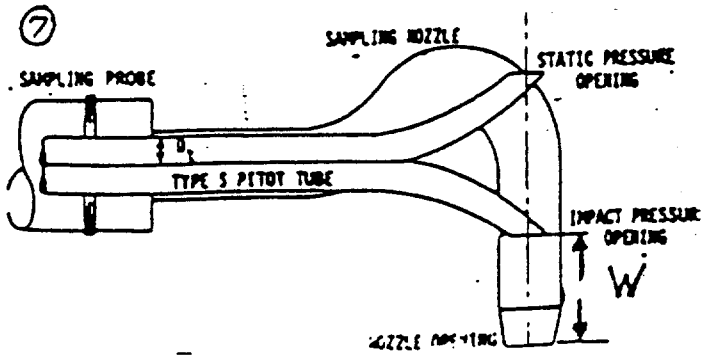
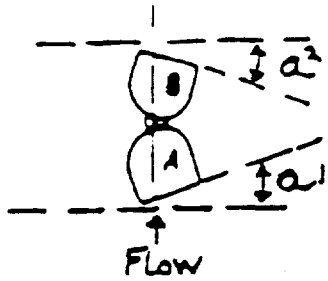


GEOMETRIC PITOT CALIBRATION

Caliper # XFS 65 | Probe #: 5-2
Precheck ✓ | Date: 11-2-93
Post Check | Initials:

①

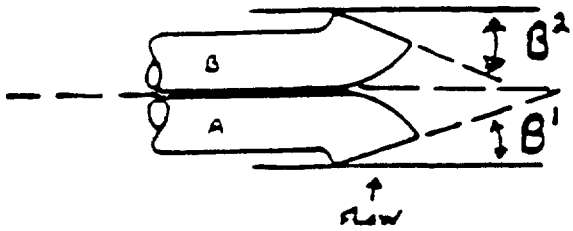


a^1 = 4.0°
a^2 = 3.0°
a^1, a^2 = <10°

B^1 = 0
B^2 = 4.0°
B^1, B^2, = <5°

F = 0.980"

②



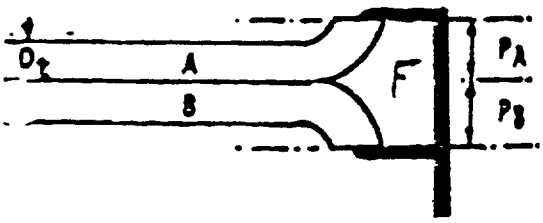
μ = 0.0465 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0 — V = ≤0.03125" (V = F TAN θ)

W = 0.355 — W ≥ 0"

X = 0.781 — X ≥ 0.750" (3/4" using 1/2" nozzle)

③



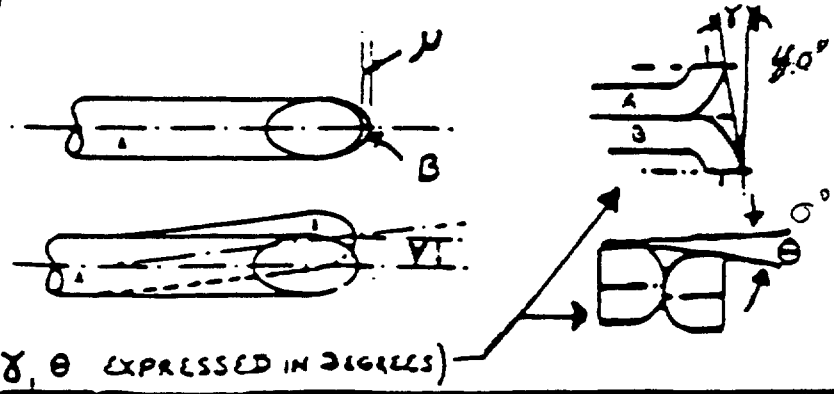
1.05 D_t < A < 1.50 D_t
$P_A = P_B$
2.10 D_t < A < 3.00 D_t

Y = 5.844 — Y ≥ 3.0"

Z = 2.265 — Z > 2.0"

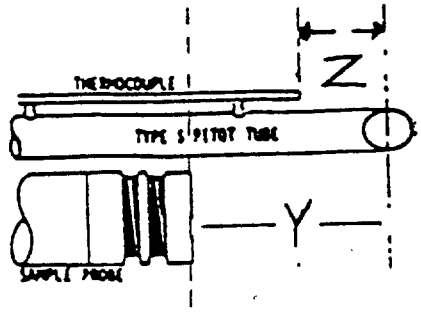
D_t = 0.377 — D_t > .1875" to .375" (3/16" to 3/8")

④



(γ, θ EXPRESSED IN DEGREES)

⑥



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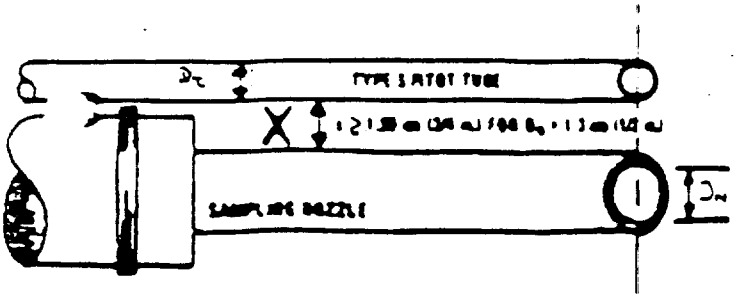
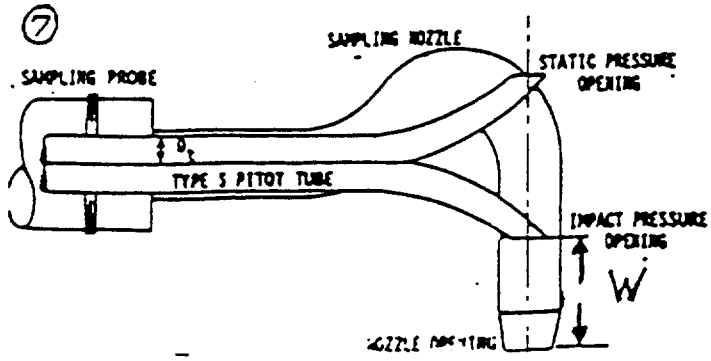


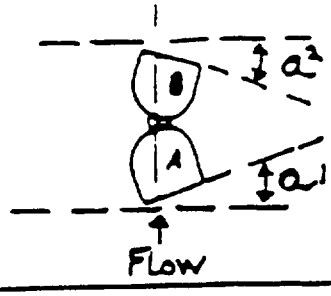
⑦



GEOMETRIC PITOT CALIBRATION

Caliper # XES-68 | Probe #: 5-2
Precheck | Date: 12-11-92
Post Check ✓ | Initials: TMT

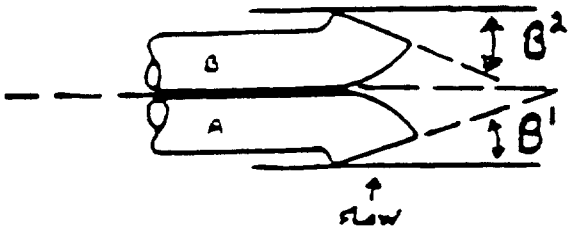
①



a^1 = 2.0
a^2 = 2.5
$a^1, a^2 = <10°$

B^1 = 3.0
B^2 = 0
$B^1, B^2, = <5°$

②



F = 0.996"

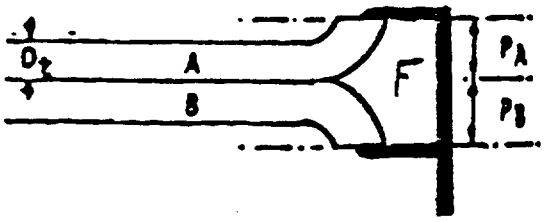
μ = 0 — $\mu = \leq 0.1250"$ ($\mu = F \tan \gamma$)

V = 0 — $V = \leq 0.03125"$ ($V = F \tan \theta$)

W = 0.231 — $W \geq 0"$

X = 0.789 — $X \geq 0.750"$ (3/4" using 1/2" nozzle)

③



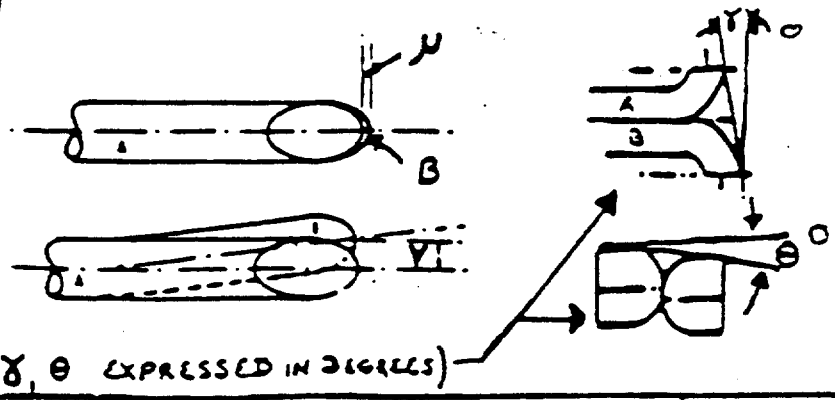
$1.05\ D_t < P < 1.50\ D_t$
$P_A = P_B$
$2.10\ D_t < A < 3.00\ D_t$

Y = 6.029 — $Y \geq 3.0"$

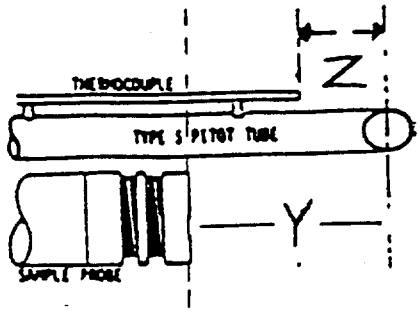
Z = 3.502 — $Z > 2.0"$

D_t = 0.374 — $D_t > .1875"$ to $.375"$ (3/16" to 3/8")

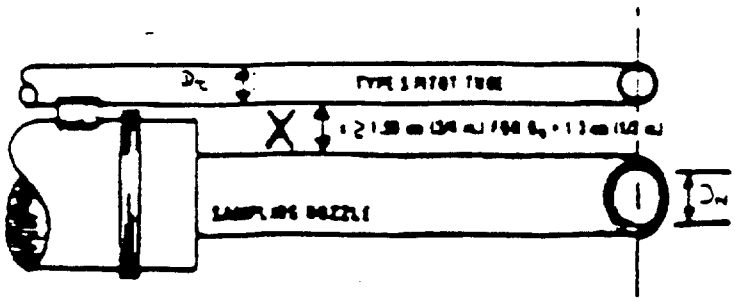
④



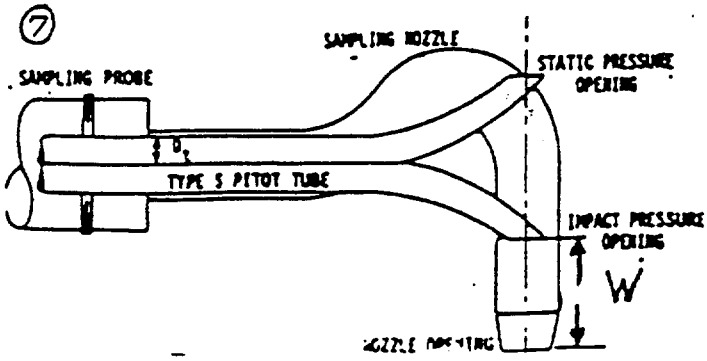
⑥



⑤



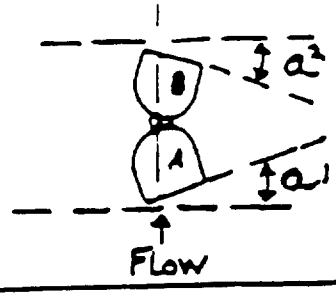
⑦



GEOMETRIC PITOT CALIBRATION

Caliper # XF5-68 | Probe #: 5-4
Precheck | Date: 12-11-93
Post Check W | Initials: ZMT

①

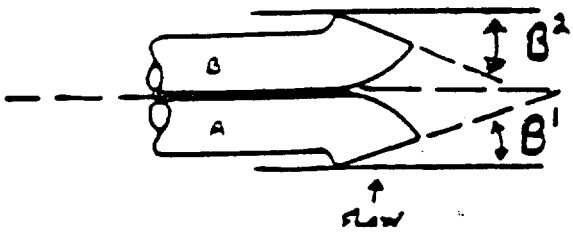


a^1 = 1.0
a^2 = 3.0
$a^1, a^2 = <10°$

B^1 = 2.0
B^2 = 1.0
$B^1, B^2, = <5°$

F = 0.869"

②



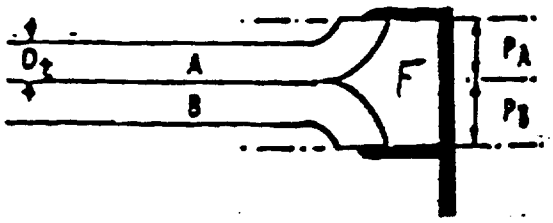
μ = 0.0151 — $\mu = \leq 0.1250"$ ($\mu = F \tan \gamma$)

V = 0.0151 — $V = \leq 0.03125"$ ($V = F \tan \theta$)

W = 0.464 — $W \geq 0"$

X = 0.791 — $X \geq 0.750"$ (3/4" using 1/2" nozzle)

③



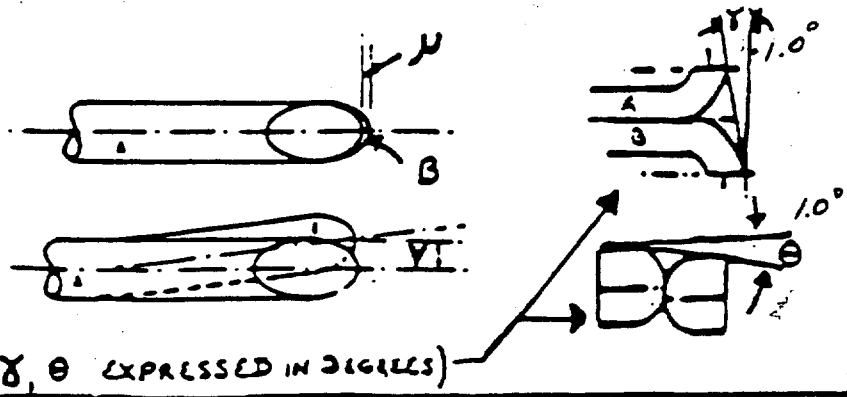
$1.05\ D_t < A < 1.50\ D_t$
$P_A = P_B$
$2.10\ D_t < A < 3.00\ D_t$

Y = 5.671 — $Y \geq 3.0"$

Z = 2.104 — $Z > 2.0"$

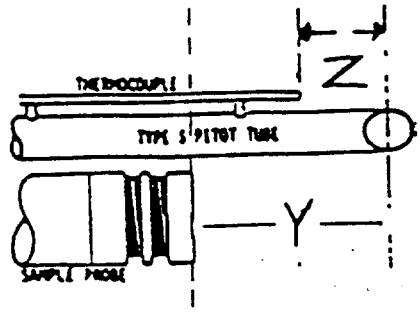
D_t = 0.371 — $D_t > .1875"$ to $.375"$ (3/16" to 3/8")

④

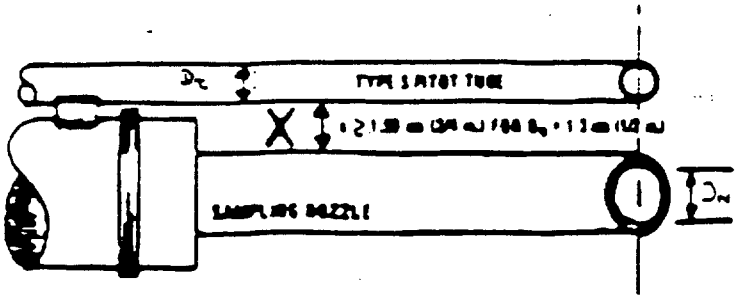


(γ, θ EXPRESSED IN DEGREES)

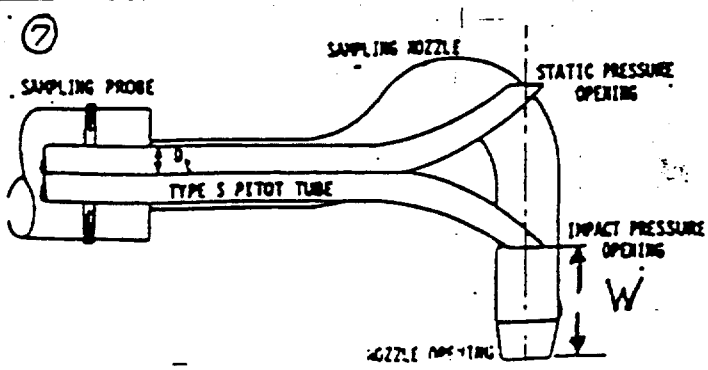
⑥



⑤



⑦

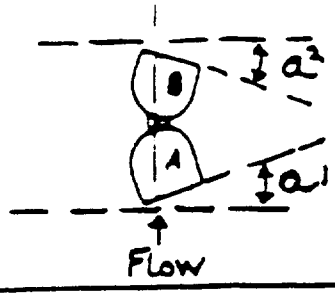


GEOMETRIC PITOT CALIBRATION

Caliper # XCF-59
Precheck ✓
Post Check

Probe #: 5-4
Date: 7-27-92
Initials: TAM

①

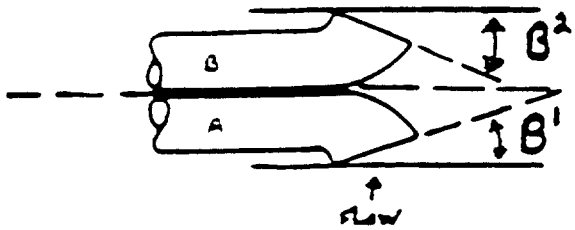


a^1 = 1.0°
a^2 = 2.5°
a^1, a^2 = <10°

B^1 = 1.5°
B^2 = 0.5°
B^1, B^2, = <5°

F = 0.854"

②



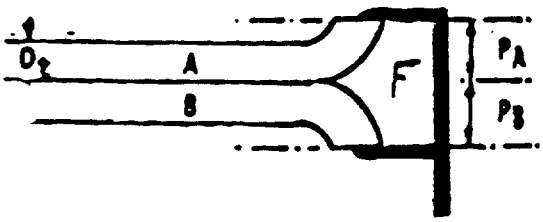
μ = 0.0149 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0.0074 — V = ≤0.03125" (V = F TAN θ)

W = 0.741 — W ≥ 0"

X = 0.762 — X ≥ 0.750" (3/4" using 1/2" nozzle)

③



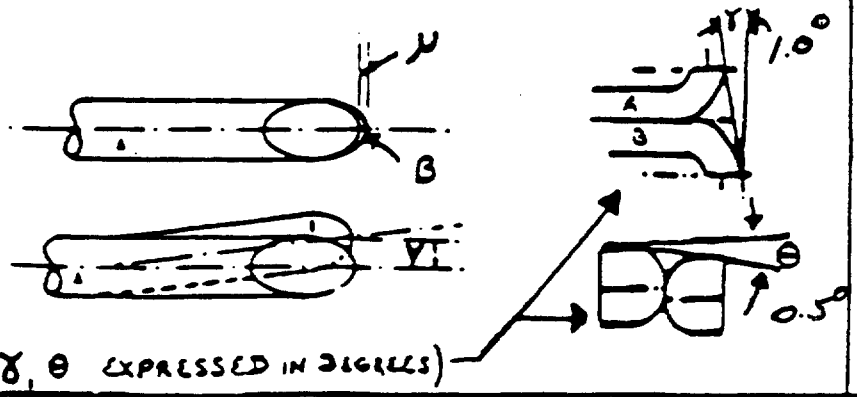
1.05 D_t < B < 1.50 D_t
P_A = P_B
2.10 D_t < A < 3.00 D_t

Y = 5.826 — Y ≥ 3.0"

Z = 2.831 — Z > 2.0"

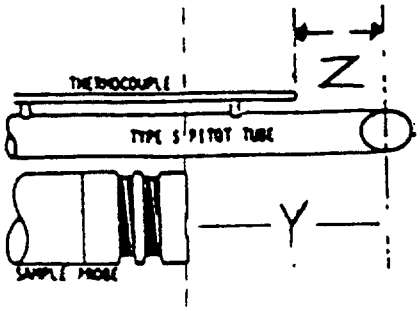
D_t = 0.376 — D_t > .1875" to .375" (3/16" to 3/8")

④

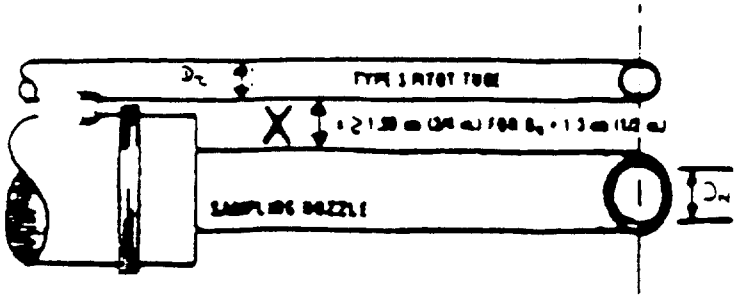


(γ, θ EXPRESSED IN DEGREES)

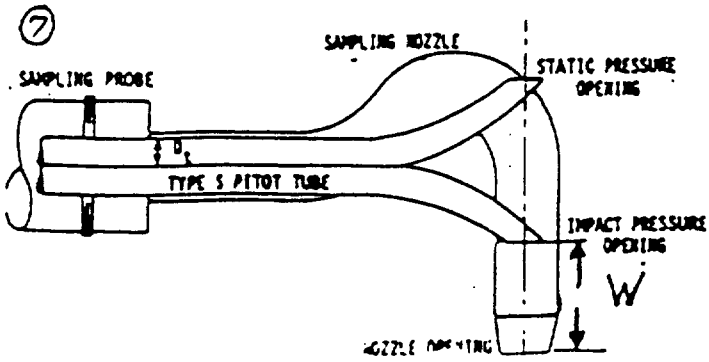
⑥



⑤



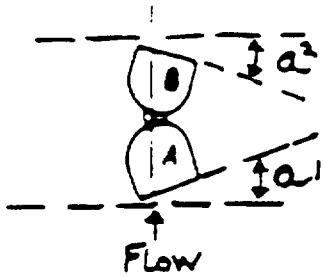
⑦



GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59 | Probe #: 5-5
Precheck | Date: 8-24-92
Post Check ✓ | Initials: TGA

①

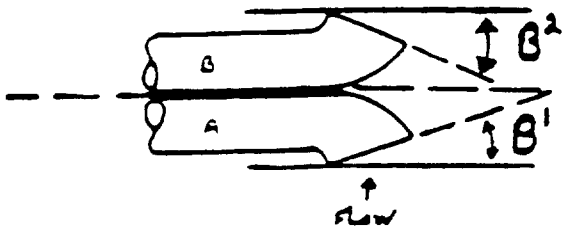


a^1 = 1.0°
a^2 = 1.0°
$a^1, a^2 = <10°$

B^1 = 1.5°
B^2 = 0
$B^1, B^2, = <5°$

F = 0.894"

②



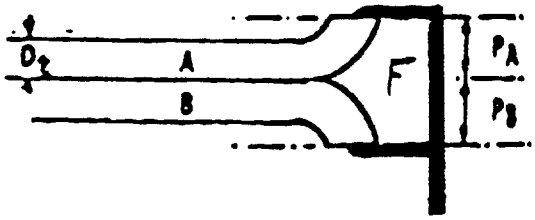
μ = 0.0234 — $\mu = \leq 0.1250"$ ($\mu = F \tan \gamma$)

V = 0.0156 — $V = \leq 0.03125"$ ($V = F \tan \theta$)

W = 0.210 — $W \geq 0"$

X = 0.782 — $X \geq 0.750"$ (3/4" using 1/2" nozzle)

③



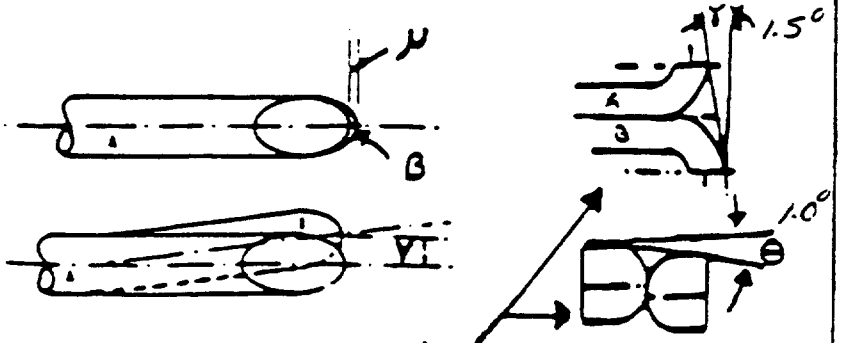
$1.05\ D_t < A < 1.50\ D_t$
$P_A = P_B$
$2.10\ D_t < B < 3.00\ D_t$

Y = 5.715 — $Y \geq 3.0"$

Z = 2.144 — $Z > 2.0"$

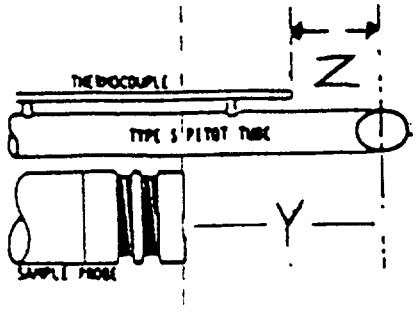
D_t = 0.375 — $D_t > .1875"$ to $.375"$ (3/16" to 3/8")

④

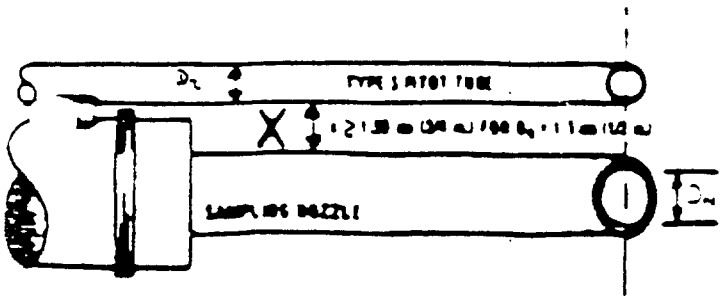


(γ, θ EXPRESSED IN DEGREES)

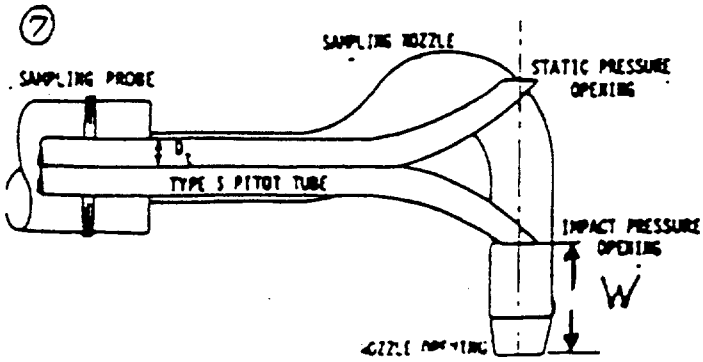
⑥



⑤



⑦



CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 3 BP 28.9 in. Hg
DATE 07-02-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT Y	ORIFICE COEFFICIENT ΔH@
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD		
START			0.000	28.90				0.50	74.200		
HALF		78.0			104.0	92.0	98.0				
STOP	11.48		5.000						79.348		
CALCULATION	11.48	538.0	5.013	28.90			558.0	28.94	5.148	1.0086	1.492
START			0.000	28.90				1.00	79.700		
HALF		78.0			108.0	94.0	101.0				
STOP	8.43		5.000						84.836		
CALCULATION	8.43	538.0	5.013	28.90			561.0	28.97	5.136	1.0151	1.601
START			0.000	28.90				2.00	96.600		
HALF		79.0			117.0	98.0	107.5				
STOP	12.05		10.000						106.880		
CALCULATION	12.05	539.0	10.025	28.90			567.5	29.05	10.280	1.0216	1.623
AVERAGE										1.0151	1.572

POST TEST

BOX # 3 BP 29.20 In. Hg
DATE 10-22-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT	ORIFICE COEFFICIENT
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	Y	ΔH@
START			0.000	29.20				1.00	538.200		
HALF		75.0			97.0	93.0	95.0				
STOP	8.85		5.000						543.400		
CALCULATION	8.85	535.0	5.013	29.20			555.0	29.27	5.200	0.9975	1.745
START			0.000	29.20				1.00	543.600		
HALF		75.0			101.0	96.0	98.5				
STOP	8.73		5.000						548.711		
CALCULATION	8.73	535.0	5.013	29.20			558.5	29.27	5.111	1.0212	1.688
START			0.000	29.20				1.00	549.100		
HALF		75.0			103.0	96.0	99.5				
STOP	8.80		5.000						554.319		
CALCULATION	8.80	535.0	5.013	29.20			559.5	29.27	5.219	1.0019	1.712
AVERAGE										1.0069	1.715
DIFFERENCE										0.8%	-8.3%

POST-TEST MAGNEHELIC CALIBRATION
BOX# 3
DATE 10-22-93
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

MAGNEHELIC Δ P	MANOMETER
0.50	0.49
0.40	0.40
0.30	0.30
0.20	0.20
0.10	0.10

0 to 5" H2O RANGE

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

POST-TEST LEAK CHECK
DATE 10-22-93
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	536.900	537.075	0.175	10.000	0.0002
WET	0.000	0.177	0.177		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

POST-TEST PYROMETER CHECK
DATE 10-22-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	111.0
2.66	150	150.0
3.82	200	201.0
6.09	300	301.0
8.31	400	402.0
10.57	500	502.0

PRE-TEST MAGNEHELIC CALIBRATION
BOX# 3
DATE 07-02-93
OPERATOR RPC

0 to 10" H2O RANGE

MAGNEHELIC

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

0 to 0.50" H2O RANGE

MAGNEHELIC

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

0 to 5" H2O RANGE

MAGNEHELIC

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

PRE-TEST LEAK CHECK
DATE 07-02-93
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	73.610	73.795	0.185	10.000	0.004
WET	0.000	0.230	0.230		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

PRE-TEST PYROMETER CHECK
DATE 07-02-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	201.0
6.09	300	300.0
8.31	400	402.0
10.57	500	502.0

QA ORIFICE AUDIT

ORIFICE	BAPC-3	DATE	10-22-93	B.P.	29.20
OPERATOR	RPC	BOX #	3		

RUN	1		2		3	
INITIAL CF	513.500		521.000		528.700	
FINAL CF	520.843		528.369		536.096	
DIFFERENCE	7.343		7.369		7.396	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	84	84	94	89	98	93
TEMP 5 MIN	91	87	95	90	99	94
TEMP 10 MIN	92	87	97	91	99	95
TEMP 15 MIN	94	89	98	93	99	95
		TEMP R		TEMP R		TEMP R
TEMP AVG	88.5	548.5	93.375	553.375	96.5	556.5
TIME (MIN.)	15.00		15.00		15.00	
	N WATE	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.70	0.05	0.70	0.05	0.70	0.05
METER PRESSURE		29.25		29.25		29.25
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	80.0	26.7	80.0	26.7	80.0	26.7
VACUUM IN HG	19.5		19.5		19.5	
DGM CAL Y	1.0151		1.0151		1.0151	
STD CF	7.042		7.004		6.990	
STD CUBIC METERS	0.1994		0.1984		0.1980	

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 6 BP 28.95 in. Hg
DATE 06-09-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT	ORIFICE COEFFICIENT
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	Y	ΔH@
START			0.000	28.95				0.50	665.100		
HALF		84			98	90	94				
STOP	13.18		5.000						670.360		
CALCULATION	13.18	544	5.013	28.95			554	28.99	5.260	0.9692	2.022
START			0.000	28.95				1.00	670.800		
HALF		84			111	95	103				
STOP	9.33		5.000						676.100		
CALCULATION	9.33	544	5.013	28.95			563	29.02	5.300	0.9763	1.994
START			0.000	28.95				2.00	676.700		
HALF		84			120	99	110				
STOP	6.63		5.000						681.931		
CALCULATION	6.63	544	5.013	28.95			570	29.10	5.231	0.9981	1.991
AVERAGE										0.9812	2.002

POST TEST

BOX # 6 BP 29.20 in. Hg
DATE 10-22-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT	ORIFICE COEFFICIENT
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	Y	ΔH@
START			0.000	29.20				1.05	726.200		
HALF		75			104	89	97				
STOP	9.20		5.000						731.542		
CALCULATION	9.20	535	5.013	29.20			557	29.28	5.342	0.9735	1.975
START			0.000	29.20				1.05	732.000		
HALF		75			89	81	85				
STOP	9.08		5.000						737.311		
CALCULATION	9.08	535	5.013	29.20			545	29.28	5.311	0.9589	1.964
START			0.000	29.20				1.05	737.600		
HALF		75			102	83	93				
STOP	9.10		5.000						743.000		
CALCULATION	9.10	535	5.013	29.20			553	29.28	5.400	0.9561	1.946
AVERAGE										0.9628	1.962
DIFFERENCE										1.9%	2.1%

PRE-TEST MAGNEHELIC CALIBRATION
BOX# 6
DATE 06-09-93
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

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

Calibration not necessary.
Primary standard on control box.

0 to 5" H2O RANGE

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

PRE-TEST LEAK CHECK
DATE 06-09-03
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	664.505	664.735	0.230	10.000	-0.001
WET	0.000	0.220	0.220		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

PRE-TEST PYROMETER CHECK
DATE 06-09-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	151.0
3.82	200	201.0
6.09	300	303.0
8.31	400	403.0
10.57	500	503.0

POST-TEST MAGNEHELIC CALIBRATION
BOX# 6
DATE 10-22-93
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

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

Calibration not necessary.
Primary standard on control box.

0 to 5" H2O RANGE

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

POST-TEST LEAK CHECK
DATE 10-22-93
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	725.750	726.000	0.250	10.000	-0.0006
WET	0.000	0.244	0.244		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

POST-TEST PYROMETER CHECK
DATE 10-22-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	300.0
8.31	400	403.0
10.57	500	503.0

QA ORIFICE AUDIT

ORIFICE BAPC-3 DATE 10-22-93 B.P. 29.20
OPERATOR RPC BOX # 6

RUN	1		2		3	
INITIAL CF	701.700		709.200		716.900	
FINAL CF	709.060		716.600		724.233	
DIFFERENCE	7.360		7.400		7.333	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	83	77	90	81	93	83
TEMP 5 MIN	85	78	90	81	94	83
TEMP 10 MIN	89	80	92	83	96	84
TEMP 15 MIN	90	81	93	83	96	84
		TEMP R		TEMP R		TEMP R
TEMP AVG	83	543	87	547	89	549
TIME (MIN.)	15.00		15.00		15.00	
	N WATE	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.75	0.06	0.75	0.06	0.75	0.06
METER PRESSURE		29.26		29.26		29.26
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	80	27	80	27	80	27
VACUUM IN HG	21.0		21.0		21.0	
DGM CAL Y	0.9812		0.9812		0.9812	
STD CF	6.894		6.884		6.790	
STD CUBIC METERS	0.1952		0.1949		0.1923	

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 7 BP 28.95 In. Hg
DATE 05-17-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT Y	ORIFICE COEFFICIENT ΔH@
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD		
START			0.000	28.95				0.50	39.300		
HALF		72			104	78	91				
STOP	12.70		5.000						44.700		
CALCULATION	12.70	532	5.013	28.95			551	28.99	5.400	0.9602	1.805
START			0.000	28.95				1.00	45.200		
HALF		73			107	81	94				
STOP	9.00		5.000						50.606		
CALCULATION	9.00	533	5.013	28.95			554	29.02	5.406	0.9613	1.810
START			0.000	28.95				2.00	51.800		
HALF		74			110	83	97				
STOP	6.33		5.000						57.190		
CALCULATION	6.33	534	5.013	28.95			557	29.10	5.390	0.9642	1.790
AVERAGE										0.9619	1.802

POST TEST

BOX # 7 BP 29.20 In. Hg
DATE 10-22-93 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER COEFFICIENT	ORIFICE COEFFICIENT
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	Y	ΔH@
START			0.000	29.20				1.25	339.800		
HALF		75			100	83	92				
STOP	8.00		5.000						345.090		
CALCULATION	8.00	535	5.013	29.20			552	29.29	5.290	0.9737	1.794
START			0.000	29.20				1.25	345.300		
HALF		75			101	84	93				
STOP	8.10		5.000						350.600		
CALCULATION	8.10	535	5.013	29.20			553	29.29	5.300	0.9736	1.836
START			0.000	29.20				1.25	350.900		
HALF		75			110	85	98				
STOP	8.13		5.000						356.203		
CALCULATION	8.13	535	5.013	29.20			558	29.29	5.303	0.9819	1.833
AVERAGE										0.9764	1.821
DIFFERENCE										-1.5%	-1.1%

PRE-TEST MAGNEHELIC CALIBRATION
BOX# 7
DATE 05-17-93
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

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

Calibration not necessary.
Primary standard on control box.

0 to 3" H2O RANGE

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

PRE-TEST LEAK CHECK
DATE 05-17-93
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	38.650	38.878	0.228	10.000	-0.003
WET	0.000	0.202	0.202		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

PRE-TEST PYROMETER CHECK
DATE 05-17-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	41.0
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	299.0
8.31	400	399.0
10.57	500	498.0

POST-TEST MAGNEHELIC CALIBRATION
BOX# 7
DATE 10-22-93
OPERATOR RPC

0 to 10" H2O RANGE

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

0 to 0.50" H2O RANGE

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

Calibration not necessary.
Primary standard on control box.

0 to 3" H2O RANGE

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

POST-TEST LEAK CHECK
DATE 10-22-93
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	338.001	338.200	0.199	10.000	-0.0004
WET	0.000	0.195	0.195		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

POST-TEST PYROMETER CHECK
DATE 10-22-93
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	300.0
8.31	400	400.0
10.57	500	502.0

QA ORIFICE AUDIT

ORIFICE BAPC-3 DATE 11-22-93 B.P. 29.20
OPERATOR RPC BOX # 7

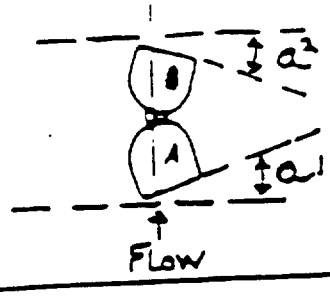
RUN	1		2		3	
INITIAL CF	445.800		453.700		461.600	
FINAL CF	453.420		461.370		469.224	
DIFFERENCE	7.620		7.670		7.624	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	80	70	81	71	82	73
TEMP 5 MIN	80	70	82	73	83	75
TEMP 10 MIN	81	71	82	73	84	75
TEMP 15 MIN	81	71	82	73	84	75
		TEMP R		TEMP R		TEMP R
TEMP AVG	76	536	77	537	79	539
TIME (MIN.)	15.00		15.00		15.00	
	N WATE	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.70	0.05	0.70	0.05	0.70	0.05
METER PRESSURE		29.25		29.25		29.25
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	75	24	75	24	75	24
VACUUM IN HG	21.0		21.0		21.0	
DGM CAL Y	0.9619		0.9619		0.9619	
STD CF	7.092		7.117		7.052	
STD CUBIC METERS	0.2009		0.2016		0.1997	

GEOMETRIC PITOT CALIBRATION

Caliper # KEF-59
Precheck ✓
Post Check

Probe #: 5-1
Date: 2-12-93
Initials: TJM

①

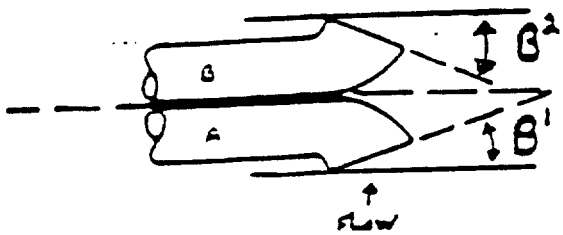


a^1 = 1.0°
a^2 = 2.0°
a^1, a^2 = <10°

B^1 = 1.0°
B^2 = 0
B^1, B^2, = <5°

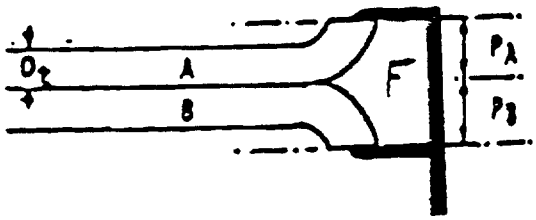
F = 1.031"

②



μ = 0.014 — μ = ≤ 0.1250" (μ = F TAN γ)
V = 0.0261 — V = ≤0.03125" (V = F TAN θ)
W = 0.212 — W ≥ 0"
X = 0.812 — X ≥ 0.750" (3/4" using 1/2" nozzle)

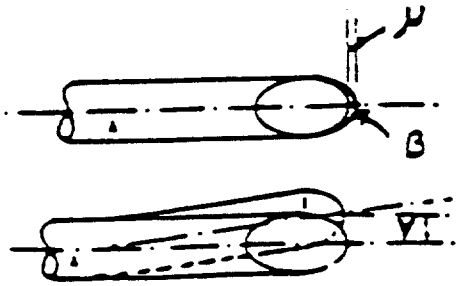
③

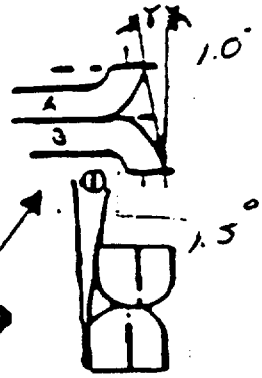


1.05 D_t < A < 1.50 D_t
P_A = P_B
2.10 D_t < A < 3.00 D_t

Y = 0.000 — Y ≥ 3.0"
Z = 2.110 — Z > 2.0"
D_t = 0.375 — D_t > .1875"

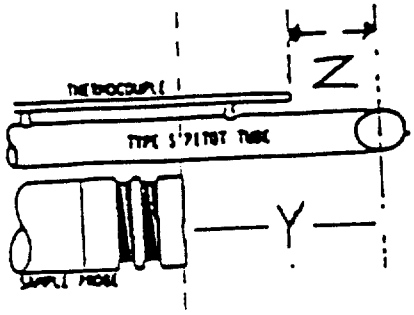
④





(γ, θ EXPRESSED IN DEGREES)

⑥



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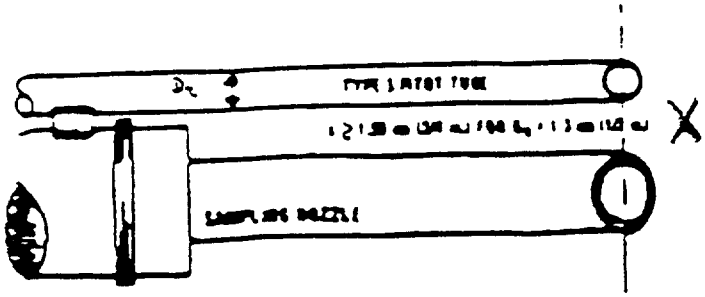

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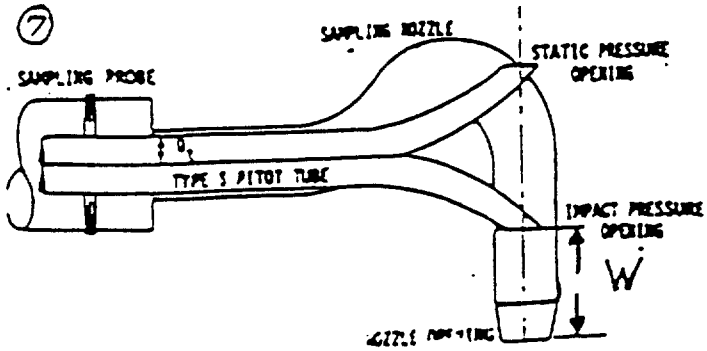
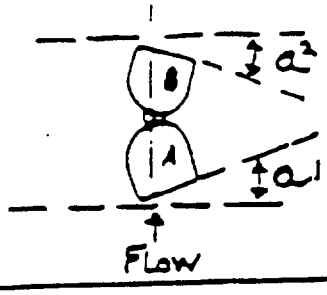


GEOMETRIC PITOT CALIBRATION

Caliper # XG-99 | Probe #: 5-1
Precheck | Date: 09-01-93
Post Check ✓ | Initials: LPC

①

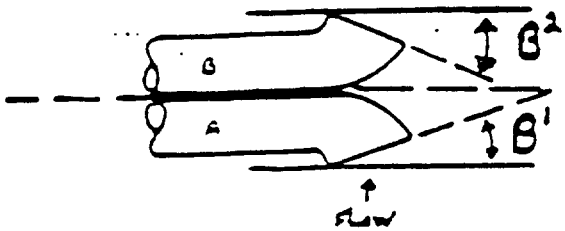


a^1 = 1.0°
a^2 = 2.0°
a^1, a^2 = <10°

B^1 = 1.0°
B^2 = 0
B^1, B^2 = <5°

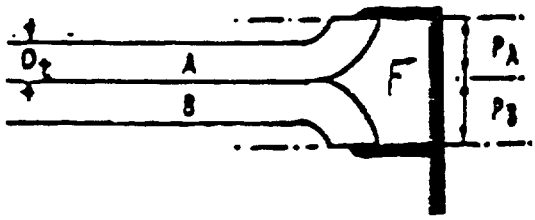
F = 1.031"

②



μ = .0174 — μ = ≤ 0.1250" (μ = F TAN γ)
V = 0.0261 — V = ≤0.03125" (V = F TAN θ)
W = .212 — W ≥ 0"

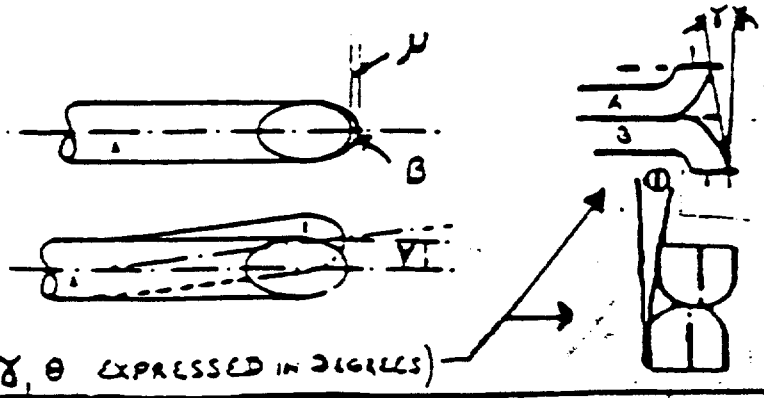
③



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

X = .81 — X ≥ 0.750" (3/4" using 1/2" nozzle)
Y = 6.0 — Y ≥ 3.0"
Z = 2.1 — Z > 2.0"
D_t = .375 — D_t > .1875"

④



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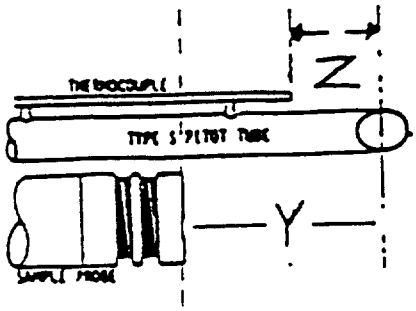

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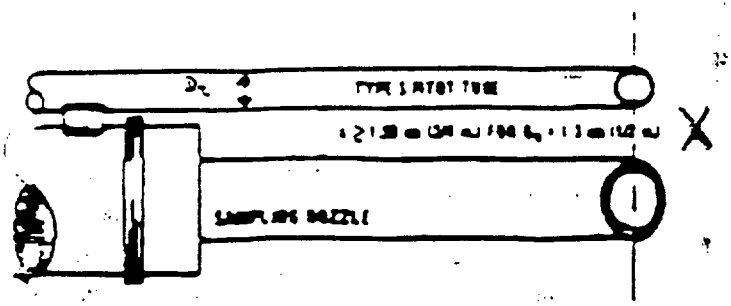

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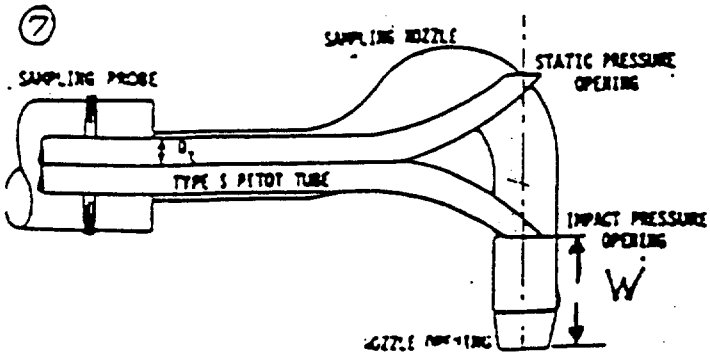
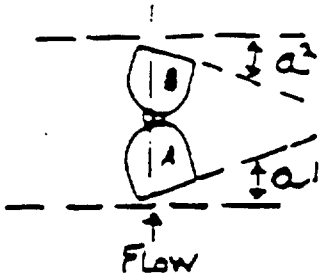


GEOMETRIC PITOT CALIBRATION

Caliper # XCF-59
Precheck ✓
Post Check

Probe #: 5-3
Date: 2-17-23
Initials: TM

①

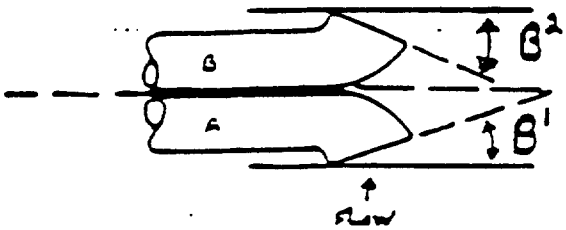


a¹ = 3.0°
a² = 2.0°
a¹, a² = <10°

B¹ = 1.0°
B² = 3.0°
B¹, B², = <5°

F = 0.896"

②



μ = 0.175 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0.175 — V = ≤0.03125" (V = F TAN θ)

W = 0.273 — W ≥ 0"

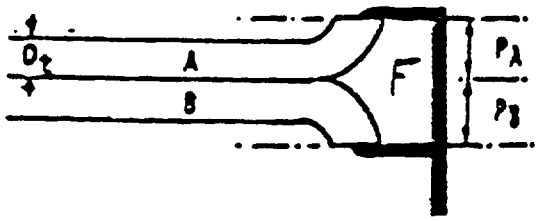
X = 0.796 — X ≥ 0.750" (3/4" using 1/2" nozzle)

Y = 6.000 — Y ≥ 3.0"

Z = 2.180 — Z > 2.0"

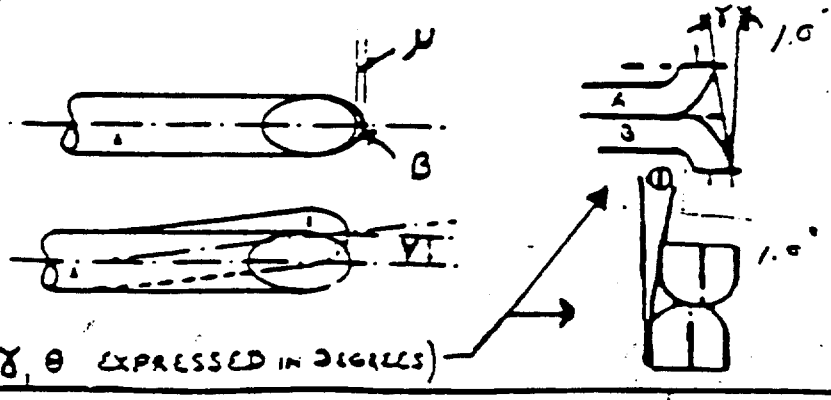
D_t = 03.77 — D_t > .1875"

③



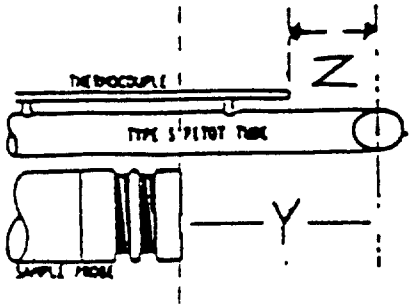
1.05 D_t < A < 1.50 D_t
P_A = P_B
2.10 D_t < A < 3.00 D_t

④

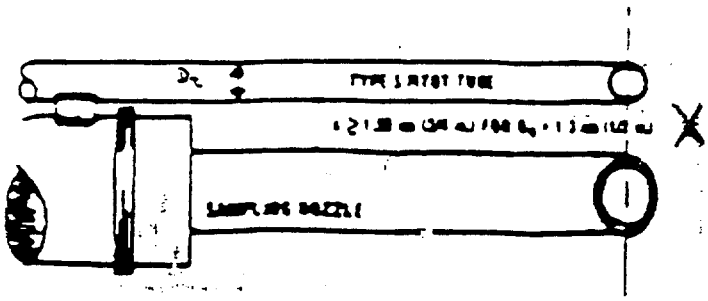


(γ, θ EXPRESSED IN DEGREES)

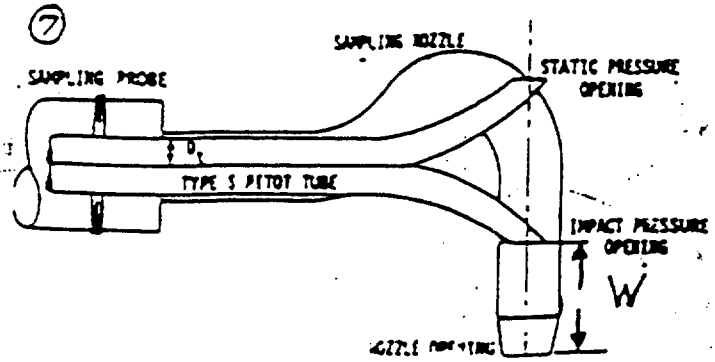
⑥



⑤



⑦

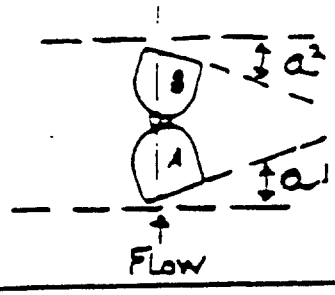


GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check ✓

Probe #: 5-3
Date: 09-01-93
Initials: [illegible]

①

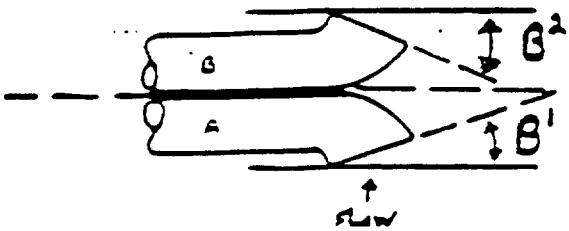


a^1 = 3.0°
a^2 = 2.0°
a^1, a^2 = <10°

B^1 = 1.0°
B^2 = 3.0°
B^1, B^2 = <5°

F = .996"

②



μ = .175 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0.175 — V = ≤0.03125" (V = F TAN θ)

W = 0.273 — W ≥ 0"

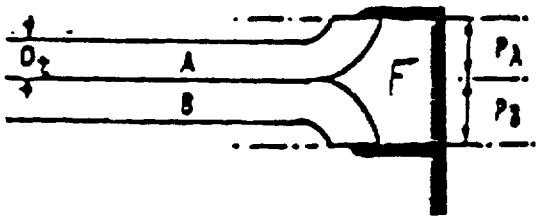
X = .796 — X ≥ 0.750" (3/4" using 1/2" nozzle)

Y = 6.0 — Y ≥ 3.0"

Z = 2.2 — Z > 2.0"

D_t = .378 — D_t > .1875"

③

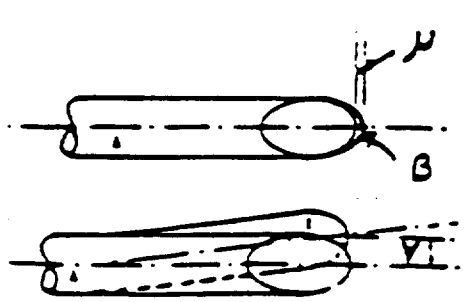


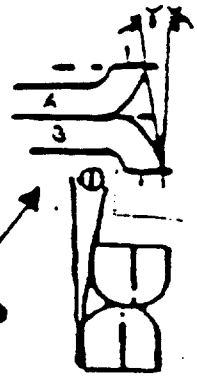
$1.05\ D_t < B < 1.50\ D_t$

$P_A = P_B$

$2.10\ D_t < A < 3.00\ D_t$

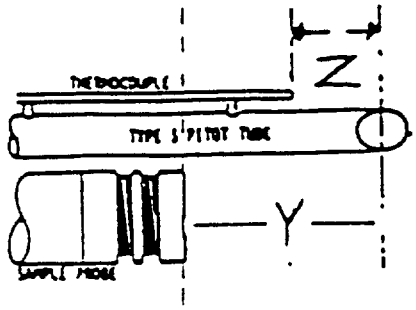
④



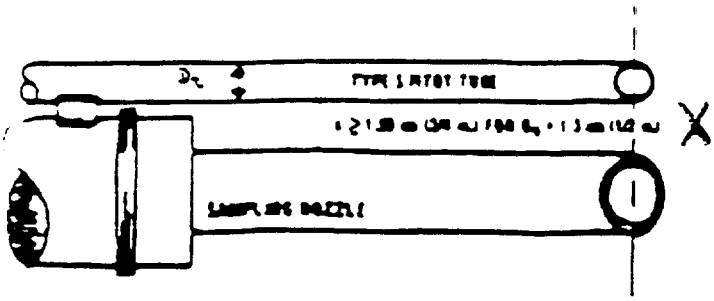


(γ, θ EXPRESSED IN DEGREES)

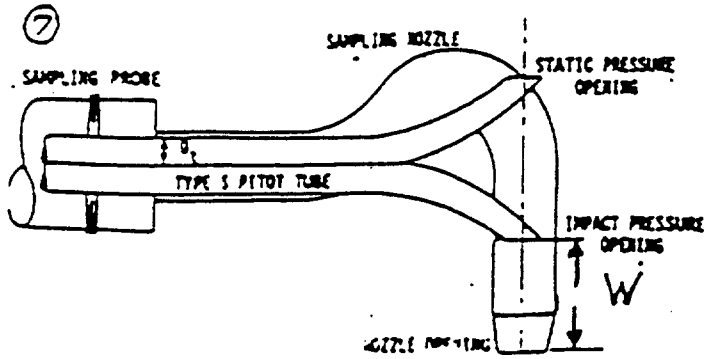
⑥



⑤



⑦

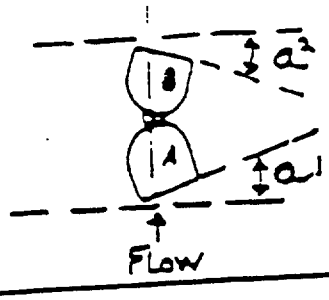


GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check ✓

Probe #: 5-3
Date: 10-25-93
Initials: KM

①

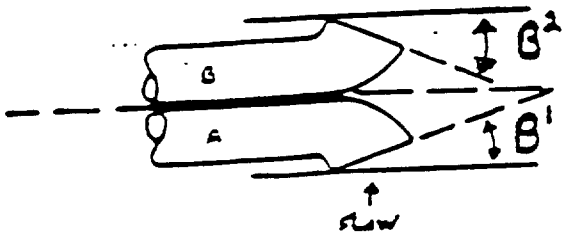


a^1 = 2.0"
a^2 = 0"
a^1, a^2 = <10°

B^1 = 1.0"
B^2 = 1.0"
B^1, B^2 = <5°

F = 0.876"

②



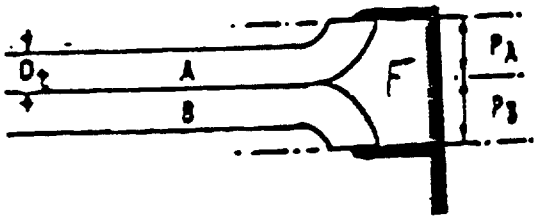
μ = 0.0350 — μ = ≤ 0.1250" (μ = F TAN γ)

V = 0.0261 — V = ≤0.03125" (V = F TAN θ)

W = 0.246 — W ≥ 0"

X = 1.236 — X ≥ 0.750" (3/4" using 1/2" nozzle)

③



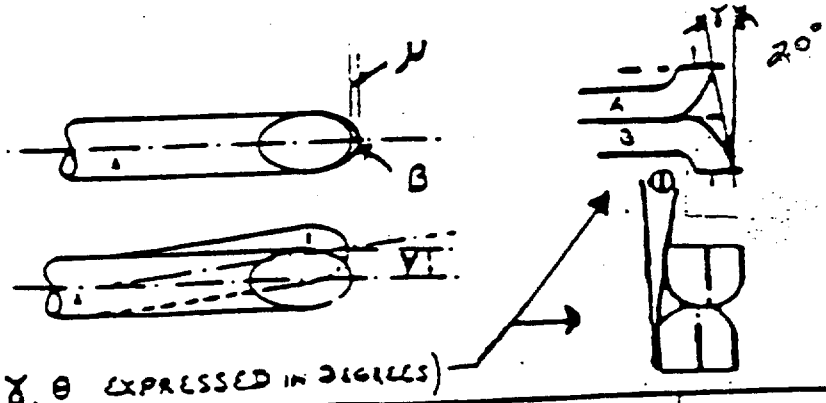
1.05 D_t < d < 1.50 D_t
$P_A = P_B$
2.10 D_t < d < 3.00 D_t

Y = 6.000 — Y ≥ 3.0"

Z = 2.069 — Z > 2.0"

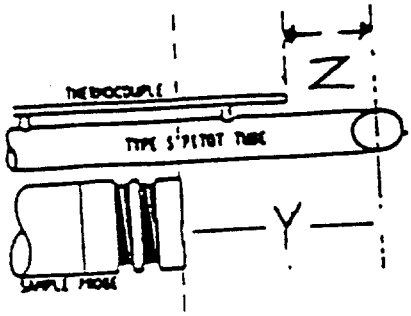
D_t = 0.375 — D_t > .1875"

④

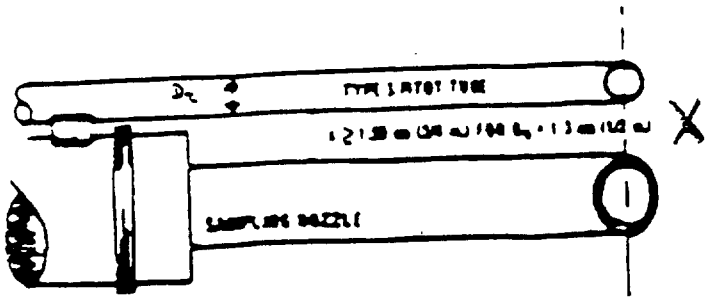


(γ, θ EXPRESSED IN DEGREES)

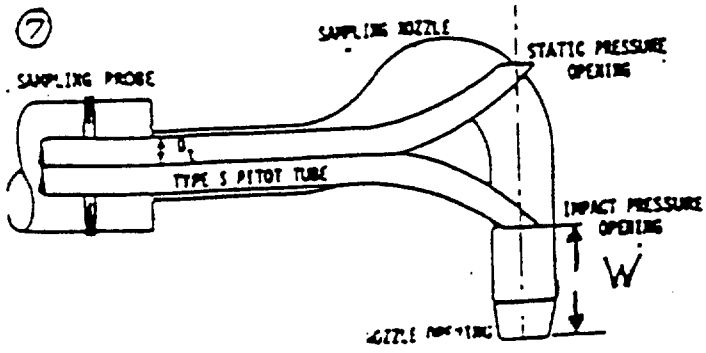
⑥



⑤



⑦

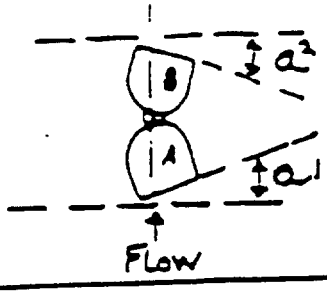


GEOMETRIC PITOT CALIBRATION

Caliper # XLF-59
Precheck ✓
Post Check

Probe #: 5.4
Date: 2-12-93
Initials: TM

①

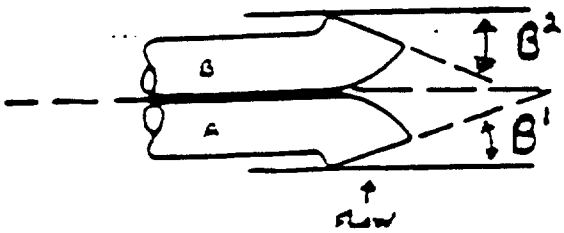


a^1 = 0°
a^2 = 4.0°
$a^1, a^2 = <10°$

B^1 = 1.0°
B^2 = 0°
$B^1, B^2, = <5°$

F = 0.884"

②



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

V = 0.0262 — $V = \leq 0.03125"$ ($V = F \tan \theta$)

W = 0.350 — $W \geq 0"$

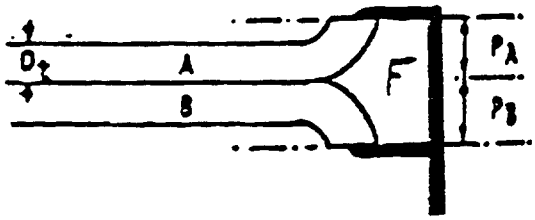
X = 0.801 — $X \geq 0.750"$ (3/4" using 1/2" nozzle)

Y = 6.000 — $Y \geq 3.0"$

Z = 2.248 — $Z > 2.0"$

D_t = 0.372 — $D_t > .1875"$

③

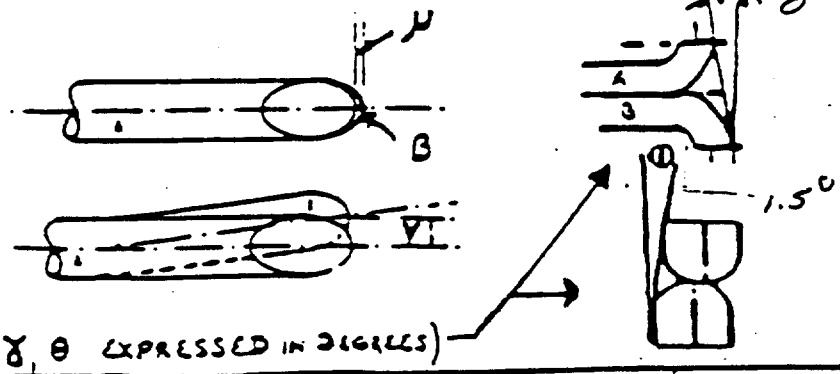


$1.05\ D_t < A < 1.50\ D_t$

$P_A = P_B$

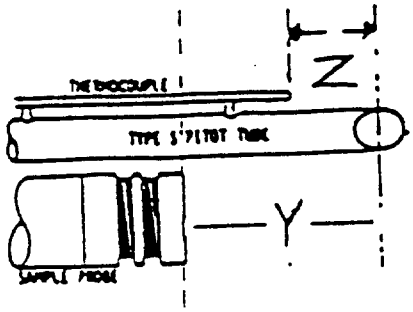
$2.10\ D_t < A < 3.00\ D_t$

④

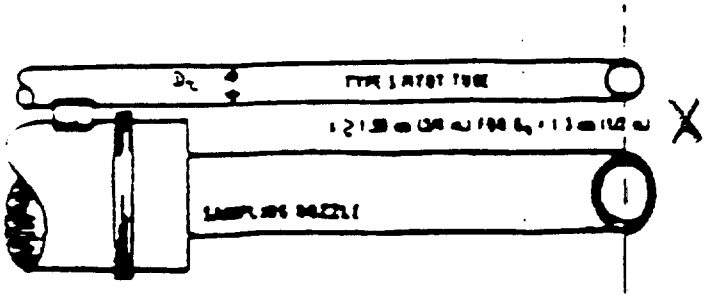


(γ, θ EXPRESSED IN DEGREES)

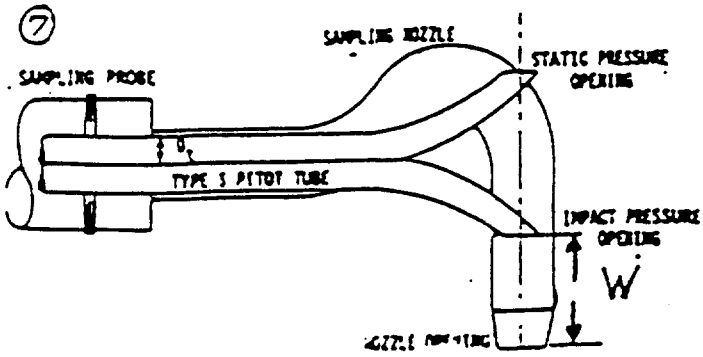
⑥



⑤



⑦

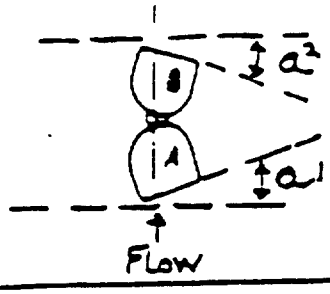


GEOMETRIC PITOT CALIBRATION

Caliper # XGF-59
Precheck
Post Check ✓

Probe #: 5-4
Date: 09-01-93
Initials: RPC

①

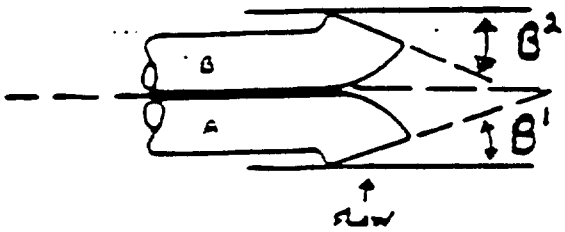


a¹ = 0°
a² = 4.0°
a¹, a² = <10°

B¹ = 1.0°
B² = 0°
B¹, B², = <5°

F = .884"

②



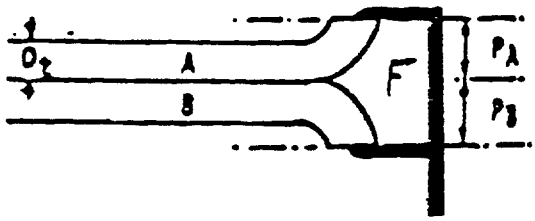
μ = 0 — μ = ≤ 0.1250" (μ = F TAN γ)

V = .026 — V = ≤0.03125" (V = F TAN θ)

W = .35 — W ≥ 0"

X = .80 — X ≥ 0.750" (3/4" using 1/2" nozzle)

③



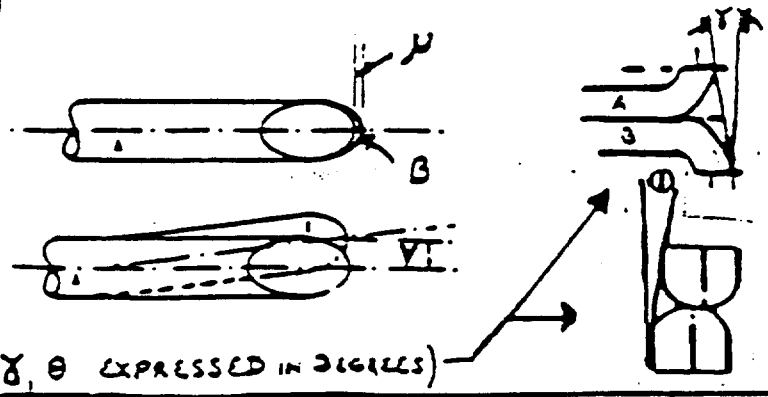
1.05 D_t < A < 1.50 D_t
$P_A = P_B$
2.10 D_t < A < 3.00 D_t

Y = 6.0 — Y ≥ 3.0"

Z = 2.25 — Z > 2.0"

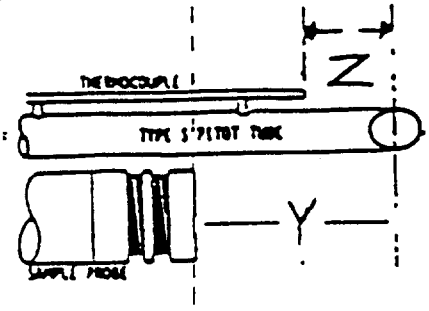
D_t = .374 — D_t > .1875"

④

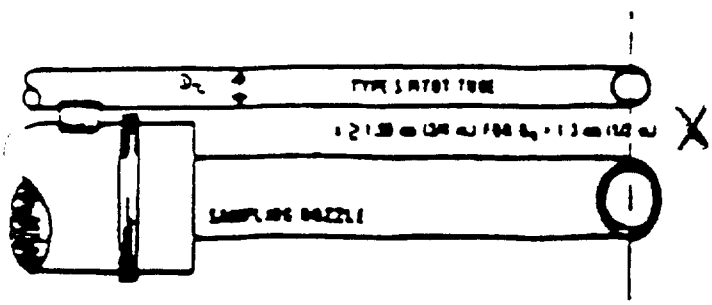


(γ, θ EXPRESSED IN DEGREES)

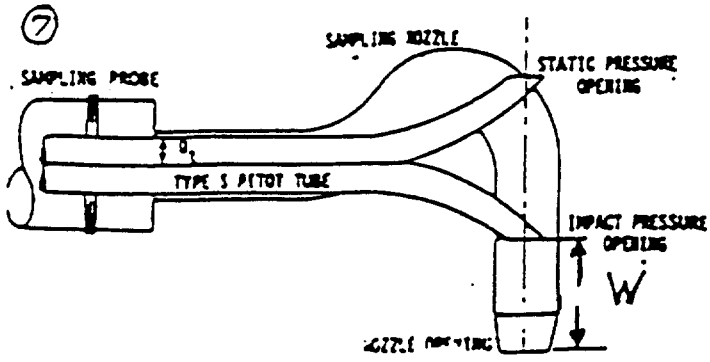
⑥



⑤



⑦



COMPLIANCE DEMONSTRATION
B BATTERY BAGHOUSE

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX B

VISIBLE EMISSIONS FIELD DATA SHEETS

VISIBLE EMISSIONS OBSERVATIONS FORM BAG HOUSE READINGS B- BATTERY

_____ SHEET

OBSERVER: BERNIE MAY

DATE: 11-17-92

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 9:00

END TIME: 10:00

OBSERVATION POINT:

SOUTH OF BAG HOUSE ROADWAY

SOURCE: BAG HOUSE B BATTERY

DISTANCE: 75 FT.

DIRECTION FROM: SOUTH

HEIGHT: 100 FT.

WIND:

SPEED: S.W 15 MPH

DIRECTION: S.W

TEMPERATURE: 47°

SKY CONDITION: CLOUDY

BACKGROUND: BLG. & SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20%

No. READINGS >= 60%

GREATEST OPACITY:

CREW: B FOREMAN: DAVE McCORKLE

COMMENTS: B-BATTERY BAG HOUSE READINGS

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

PAGE #- OF

VISIBLE EMISSIONS OBSERVATIONS FORM BAG HOUSE READINGS B- BATTERY

[redacted]

OBSERVER: BERNIE MAY

DATE: 11-17-92

FACILITY: U.S.X CLAIRTON

OBSERVATION: START TIME: 10:00

END TIME: 11:00

OBSERVATION POINT:

SOUTH OF BAGHOUSE ROADWAY

SOURCE: BAG HOUSE B BATTERY

DISTANCE: 75 FT.

DIRECTION FROM: SOUTH

HEIGHT: 100 FT.

WIND:

SPEED: S.W 15 MPH

DIRECTION: S.W

TEMPERATURE: 48°

SKY CONDITION: CLOUDY

BACKGROUND: BLG. & SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20%

No. READINGS >= 60%

GREATEST OPACITY:

CREW: B FOREMAN: DAVE McCORKLE

COMMENTS: B- BATTERY BAG HOUSE READING

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

VISIBLE EMISSIONS OBSERVATIONS FORM BAG HOUSE READINGS B-BATTERY

STACK

OBSERVER: BEANIE MAY

DATE: 11-17-92

FACILITY: U.S.X CLAIRTON

OBSERVATION: START TIME: 11:00

END TIME: 11:26

OBSERVATION POINT:

SOUTH OF BAGHOUSE ROADWAY

SOURCE:

DISTANCE: 75 FT.

DIRECTION FROM: SOUTH

HEIGHT: 100 FT.

WIND:

SPEED: 16. M.P.H

DIRECTION: S.W

TEMPERATURE: 49°

SKY CONDITION: CLOUDY

BACKGROUND: BLG. & SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION:

TOTAL No. OF READINGS: 104

No. READINGS >= 20%

No. READINGS >= 60%

GREATEST OPACITY:

CREW: 3 FOREMAN: DAVE McCORKLE

COMMENTS: B-BATTERY BAG HOUSE READINGS

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

VIDEO TAPE

VISIBLE EMISSIONS OBSERVATIONS FORM BAG HOUSE READING B-BATTERY

[redacted]

OBSERVER: BERNIE MAY

DATE: 11-17-92

FACILITY: U.S.K CLAIRTON

OBSERVATION: START TIME: 2.00

END TIME: 3.00

OBSERVATION POINT:

ROADWAY S.E. BY #3 FEEDER ROOM

SOURCE: BAG HOUSE B-BATTERY

DISTANCE: 100 FT.

DIRECTION FROM: S.E

HEIGHT: 100 FT.

WIND:

SPEED: 16 M.P.H

DIRECTION: WEST

TEMPERATURE: 48°

SKY CONDITION: CLOUDY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20%

No. READINGS >= 60%

GREATEST OPACITY:

CREW: B FOREMAN: DAVE MCCORKLE

COMMENTS: B-BATTERY BAG HOUSE READINGS

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

VISIBLE EMISSIONS OBSERVATIONS FORM BAG HOUSE READINGS B - BATTERY

[redacted]

OBSERVER: BERNIE MAY

DATE: 11-17-92

FACILITY: U.S.X CLAIRTON

OBSERVATION: START TIME: 3:00

END TIME: 4:00

OBSERVATION POINT:

ROAD WAY S.E. BY #3 FEEDER ROOM

SOURCE: BAGHOUSE B - BATTERY

DISTANCE: 100 F.T.

DIRECTION FROM: S.E.

HEIGHT: 100 F.T.

WIND:

SPEED: 15 M.P.H.

DIRECTION: WEST

TEMPERATURE: 49°

SKY CONDITION: CLOUDY & RAIN SHOWERS

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20%

No. READINGS >= 60%

GREATEST OPACITY:

CREW: B FOREMAN: DAVE MCCORKLE

COMMENTS: B - BATTERY BAG HOUSE READINGS

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

VISIBLE EMISSIONS OBSERVATIONS FORM BAGHOUSE READINGS B-BATTERY

_____ SMOK

OBSERVER: BERNIE MAY

DATE: 11-17-92

FACILITY: U.S.X CLAIRTON

OBSERVATION: START TIME: 4:00

END TIME: 5:00

OBSERVATION POINT:

ROADWAY S.E. RY #3 FEEDER ROOM.

SOURCE: BAGHOUSE B-BATTERY

DISTANCE: 100 FT.

DIRECTION FROM: S.E

HEIGHT: 100 F.T.

WIND:

SPEED: 14 MPH

DIRECTION: WEST

TEMPERATURE: 49°

SKY CONDITION: CLOUDY & RAIN SHOWERS

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20%

No. READINGS >= 60%

GREATEST OPACITY:

CREW: B FOREMAN: DAVE MCCORKLE

COMMENTS: B-BATTERY BAGHOUSE READINGS

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

VISIBLE EMISSIONS OBSERVATIONS FORM BAGHOUSE READINGS B- BATTERY

[redacted]

OBSERVER: BERNIE MAY

DATE: 11-17-92

FACILITY: U.S.X CLAIRTON

OBSERVATION: START TIME: 5.00

END TIME: _____

OBSERVATION POINT:

ROADWAY S.E BY #3 FEEDER ROOM.

SOURCE: BAGHOUSE B-BATTERY

DISTANCE: 100FT.

DIRECTION FROM: S.E.

HEIGHT: 100 FT

WIND:

SPEED: 14 M.P.H

DIRECTION: WEST

TEMPERATURE: 48°

SKY CONDITION: CLOUDY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION: _____

TOTAL No. OF READINGS: 64

No. READINGS >= 20% _____

No. READINGS >= 60% _____

GREATEST OPACITY: _____

CREW: B FOREMAN: _____

COMMENTS: B-BATTERY BAGHOUSE READINGS

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

"B" Battery Pushing

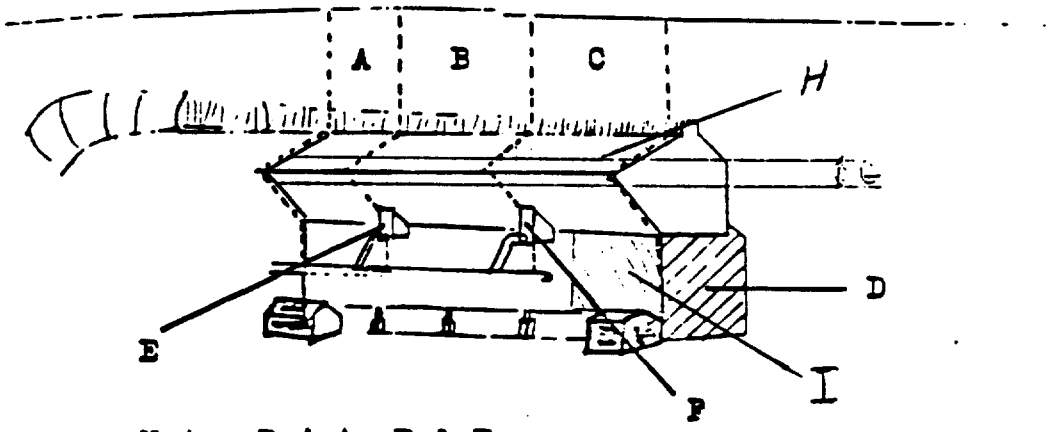
Name: [illegible]

Date: 11-17-92

Foreman: D-McCorkle Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-25	9:06	0	0	None
A-30	9:17	0	0	None
B-30	9:36	0	5%	Area "A" Above Lighting
A-35	9:46	0	0	None
A-2	10:35	0	10%	Area "D"
B-2	10:49	0	0	None
B-35	11:00	0	5%	Area "A" Above Lighting
A-7	11:12	0	5%	Area "D"

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

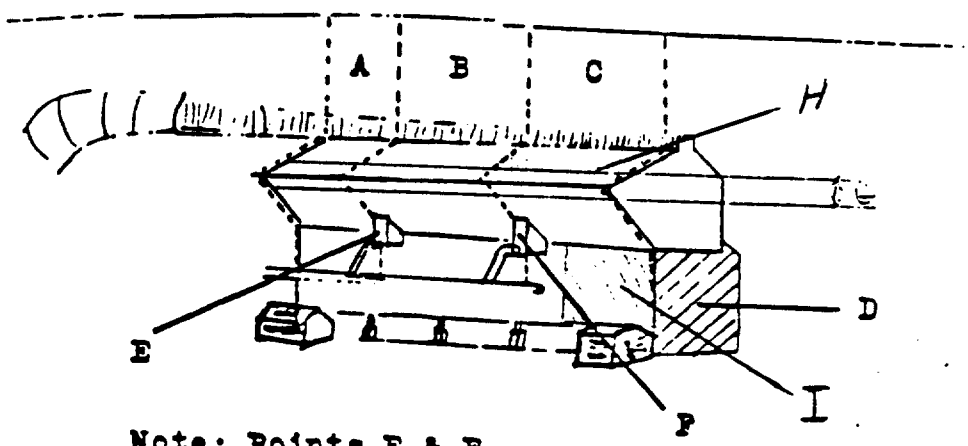
Name: [illegible]

Date: 11-17-92

Foreman: D. McCowie Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-7	11:23	0	0	NONE
A-27	14:05	0	0	NONE
B-27	14:25	0	5%	AREA "A" Above Lighting
A-32	14:34	0	5%	AREA "B" Above Lighting
B-32	1443	0	0	NONE
A-37	14:57	0	0	NONE
B-27	15:07	0	5%	AREA "A" Above Lighting
A-4	15:21	0	6%	AREA "D"

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

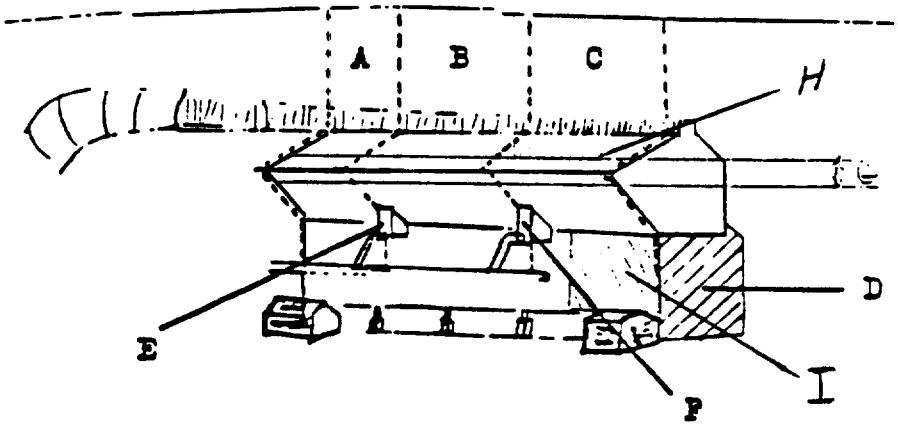
Name: [illegible]

Date: 11-17-92

Foreman: D. McCoykle Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-4	15:34	0	5%	AREA "B" Above Lighting
A-9	15:43	0	10%	AREA D (Wind Blowing South)
B-9	15:53	0	0	NONE
A-14	16:14	0	0	NONE
B-14	16:29	0	0	NONE
A-19	16:43	0	0	NONE
B-19	16:52	0	0	NONE

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.

VISIBLE EMISSIONS OBSERVATIONS FORM BAGHOUSE READINGS B- BATTERY

_____ STACK

OBSERVER: BERNIE MAY

DATE: 11-18-92

FACILITY: U.S.X CLAIRTON

OBSERVATION: START TIME: 8:50

END TIME: 9:49

OBSERVATION POINT:

ROADWAY S.E BY #3 FEEDER ROOM

SOURCE: BAGHOUSE B-BATTERY

DISTANCE: 100 FT

DIRECTION FROM: S.E

HEIGHT: 10 FT.

WIND:

SPEED: 7 M.P.H

DIRECTION: NORTH

TEMPERATURE: 43°

SKY CONDITION: CLOUDY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20%

No. READINGS >= 60%

GREATEST OPACITY:

CREW: C FOREMAN: DENNY SAWDERS

COMMENTS: B- BATTERY BAGHOUSE READINGS

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

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

VISIBLE EMISSIONS OBSERVATIONS FORM BAGHOUSE READINGS B-BATTERY

_____ ~~SCHOOK~~

OBSERVER: BERNIE MAY

DATE: 1-12-90

FACILITY: U.S.X CLAIRTON

OBSERVATION: START TIME: 9:50

END TIME: 10:49

OBSERVATION POINT:

ROADWAY S.E BY #3 FEEDER ROOM.

SOURCE: BAGHOUSE B-BATTERY

DISTANCE: 100. F.T.

DIRECTION FROM: S.E

HEIGHT: 10 F.T.

WIND:

SPEED: 9. M.P.H.

DIRECTION: NORTH

TEMPERATURE: 44°

SKY CONDITION: CLOUDY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION:

TOTAL No. OF READINGS: 240

No. READINGS >= 20%

No. READINGS >= 60%

GREATEST OPACITY:

CREW: C FOREMAN: DENNY SAWDERS

COMMENTS: B-BATTERY BAGHOUSE READINGS

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

PAGE #3 of 3

VISIBLE EMISSIONS OBSERVATIONS FORM BAGHOUSE READINGS B-BATTERY

_____ SMOKE

OBSERVER: BERNIE MAY

DATE: 11-18-92

FACILITY: U.S.X CLAIRTON

OBSERVATION: START TIME: 10:50

END TIME: _____

OBSERVATION POINT:

ACADLEY S.E. RY #3 FEEDER ROOM.

SOURCE: BAG HOUSE B-BATTERY

DISTANCE: 100 F.T.

DIRECTION FROM: S.E

HEIGHT: 10. F.T.

WIND:

SPEED: 9. M.P.H.

DIRECTION: NORTH.

TEMPERATURE: 44°

SKY CONDITION: CLOUDY

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSION: _____

TOTAL No. OF READINGS: _____

No. READINGS >= 20% _____

No. READINGS >= 60% _____

GREATEST OPACITY: _____

CREW: C FOREMAN: DENNY SANDERS

COMMENTS: B-BATTERY BAGHOUSE READINGS

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

B BATTERY BAGHOUSE TEST

PUSHING SHED OBSERVATIONS

"B" Battery Pushing

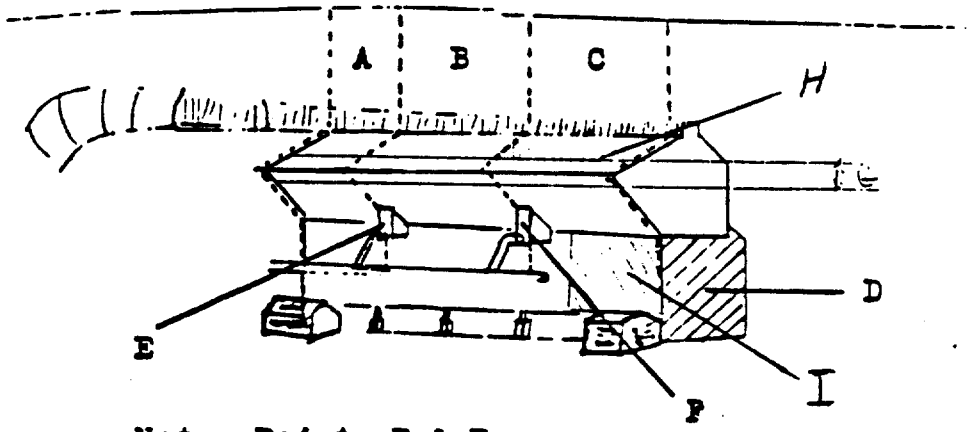
Name: [illegible]

Date: 11-18-92

Foreman: HALL Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B-37	8:57	:07	35%	SECTIONS A+B AT AREA G
A-4	9:10	:00	:5%	APEX OF SECTION C
B-4	9:34	:00	0	NO EMISSIONS
A-9	9:45	:11	25%	HEVIEST EMISSIONS FROM SOUTH END OF SHED
B-9	10:30	:00	5%	APEX OF SECTION B
A-14	10:41	:00	0	NO EMISSIONS
B-14	11:02	:00	0	NO EMISSIONS
A-19	11:19	:00	10%	APEX OF SECTIONS B+C

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

[redacted]

OBSERVER: R. BRIAN FAJTAK

DATE: 8-24-93

FACILITY: CLAIRTON

OBSERVATION: START TIME: 0938 hrs

END TIME: 1038 hrs

OBSERVATION POINT:
#3 TRANSFER STATION

SOURCE: B-BATT. BAGHOUSE

DISTANCE: ≈ 150'

DIRECTION FROM: EAST

HEIGHT: ≈ 90'

WIND:

SPEED: 5-10 mph

DIRECTION: N.W

TEMPERATURE: 81

SKY CONDITION: 25% clouds

BACKGROUND: SKY/ PLANT STRUCTURES

READING CONDITIONS: GOOD

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% [redacted] —

No. READINGS >= 60% —

GREATEST OPACITY: 0%

CREW: ____ FOREMAN: ____

COMMENTS: ____

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

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

(B)

VISIBLE EMISSIONS OBSERVATIONS FORM

[redacted]

OBSERVER: R. Brian Fajfak

DATE: 8-24-93

FACILITY: Clarton

OBSERVATION: START TIME: 1038 hrs

END TIME: 1128 hrs

OBSERVATION POINT:
#3 TRANSFER STATION

SOURCE: B-Batt. Baghouse

DISTANCE: ≈150'

DIRECTION FROM: EAST

HEIGHT: ≈90'

WIND:

SPEED: 5-10 mph

DIRECTION: N-W

TEMPERATURE: 81

SKY CONDITION: 50% clouds

BACKGROUND: Sky / Plant structures

READING CONDITIONS: GOOD

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: 0%

CREW: ____ FOREMAN: ____

COMMENTS: ____

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

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

③

VISIBLE EMISSIONS OBSERVATIONS FORM

[redacted]

OBSERVER: R. Brian Faytak

DATE: 8-24-93

FACILITY: Clarton

OBSERVATION: START TIME: 1138 hrs

END TIME: 1238 hrs

OBSERVATION POINT:

#3 TRANSFER STATION

SOURCE: B. Batt BAGHOUSE

DISTANCE: ≈ 150'

DIRECTION FROM: EAST

HEIGHT: ≈ 90'

WIND:

SPEED: 5-10 mph

DIRECTION: N-W

TEMPERATURE: 83

SKY CONDITION: 50% clouds

BACKGROUND: SKY/ Plant structures

READING CONDITIONS: GOOD

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: 0%

CREW: ____ FOREMAN: ____

COMMENTS: 7+8 module test started AT 1225 hrs

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

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

④

VISIBLE EMISSIONS OBSERVATIONS FORM

[redacted]

OBSERVER: R. Brian Fajfak

DATE: 8-24-93

FACILITY: Clairton

OBSERVATION: START TIME: 1238 hrs

END TIME: 1338 hrs

OBSERVATION POINT:

~~Clairton~~

#3 TRANSFER STATION

SOURCE: B-BATT.

BAGHOUSE

DISTANCE: ≈150'

DIRECTION FROM: East

HEIGHT: ≈90'

WIND:

SPEED: 5-10 mph

DIRECTION: N-W

TEMPERATURE: 84

SKY CONDITION: 90% clouds

BACKGROUND: SKY/

Plant structures

READING CONDITIONS: GOOD

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: 0%

CREW: ____ FOREMAN: ____

COMMENTS: ____

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

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

(5)

VISIBLE EMISSIONS OBSERVATIONS FORM

[redacted]

OBSERVER: R. BRIAN FAJTAK

DATE: 8-24-93

FACILITY: CLARTON

OBSERVATION: START TIME: 1338 HRS

END TIME: 1438 HRS

OBSERVATION POINT:

#3 TRANSFER STATION

SOURCE: B-BATT. BAGHOUSE

DISTANCE: ≈150'

DIRECTION FROM: EAST

HEIGHT: ≈90'

WIND:

SPEED: 5-10 mph

DIRECTION: N-W

TEMPERATURE: 86

SKY CONDITION: OVERCAST

BACKGROUND: SKY/ PLANT STRUCTURES

READING CONDITIONS: GOOD

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: 0%

CREW: ____ FOREMAN: ____

COMMENTS: ____

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

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

"B" Battery Pushing

START TEST 9:35

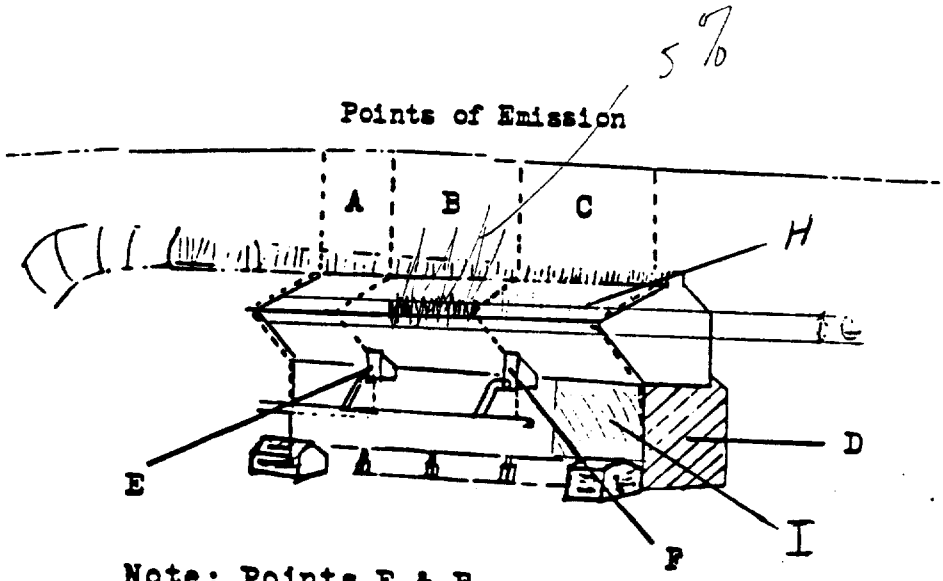
Name: DENNE

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B1	10:10	00	5%	PASSED

Points of Emission



Note: Points E & F Designate Doorways

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

"B" Battery Pushing

TEST

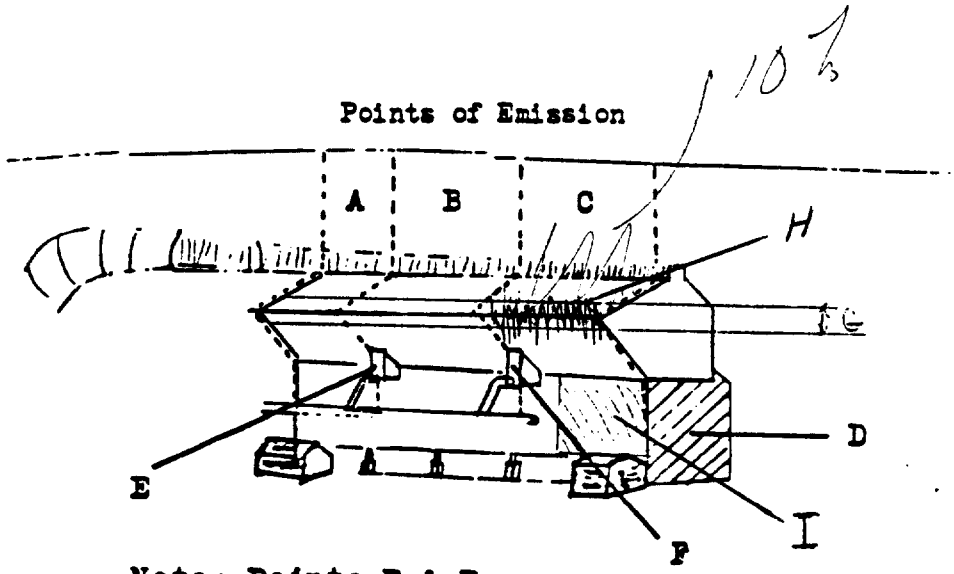
Name: DENNE

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A6	1041	:00	10%	PASSED

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 TEST

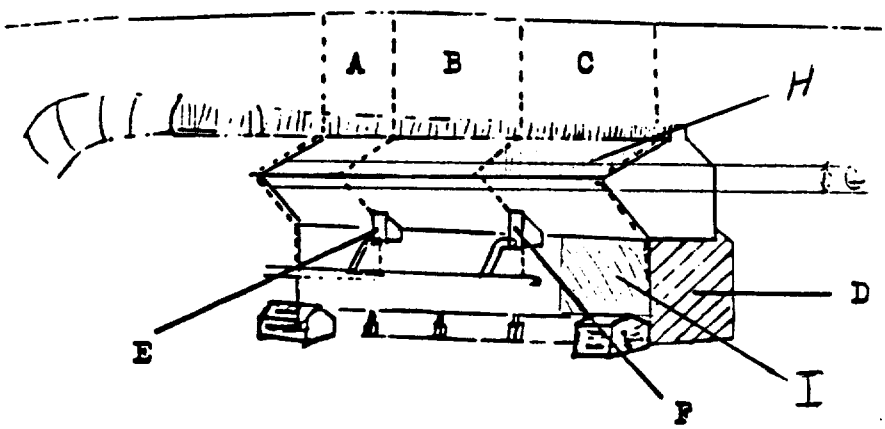
Name: DENNC

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B6	10:52	:00	0 %	PASSED

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

TEST

Name: DENNE

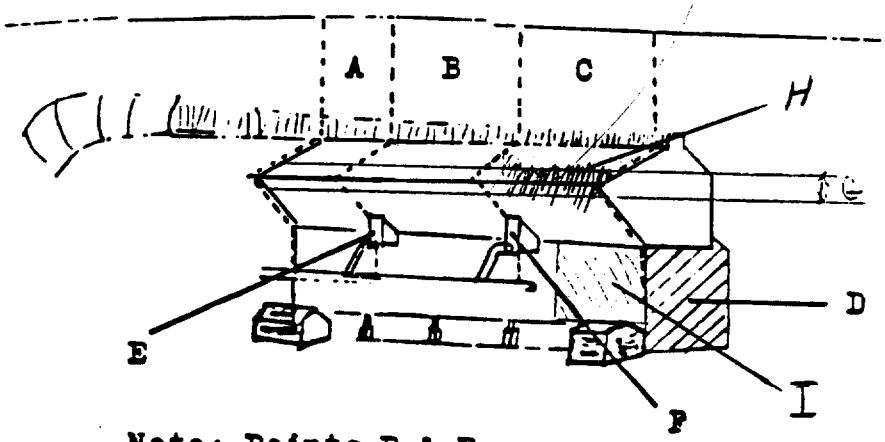
Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
All	11:12	:00	10%	PASSED

10%

Points of Emission



Note: Points E & F
Designate Doorways

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

"B" Battery Pushing

Name: Denne

Date: 8-24-93

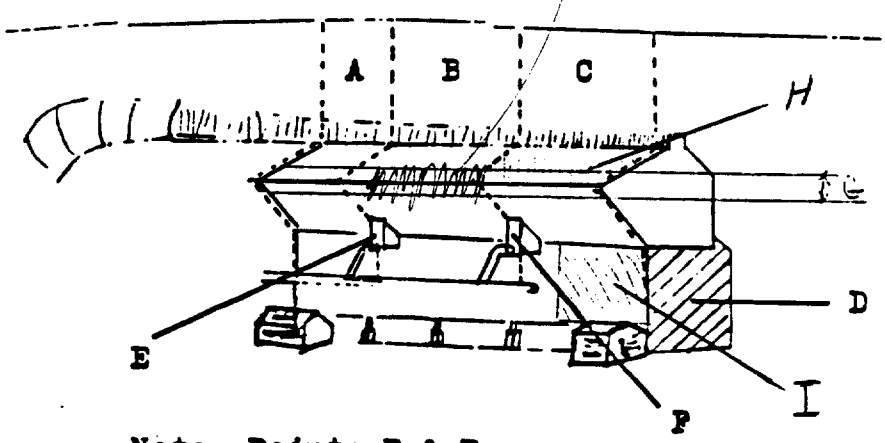
Foreman: Kapusta Crew: B

TEST

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B11	11:21	:00	10%	PASSED

10%

Points of Emission



Note: Points E & F
Designate Doorways

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

"B" Battery Pushing

Name: DENNE

Date: 8-24-93

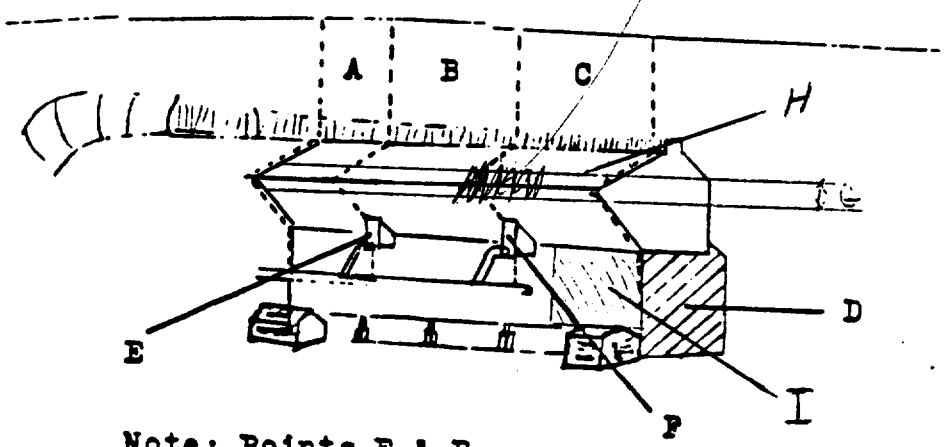
Foreman: KAPUSTA Crew: B

TEST

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A16	11:39	:00	15%	PASSED

15%

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

TEST

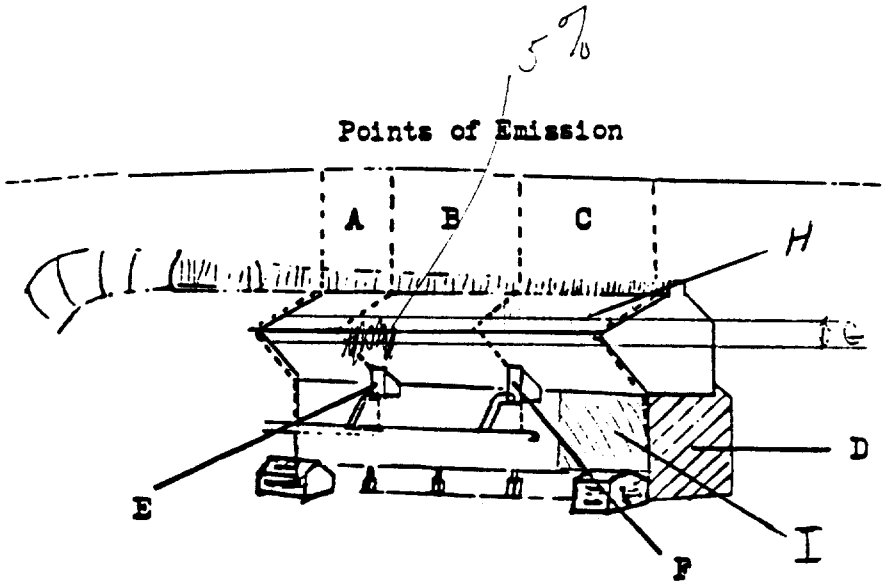
Name: DENNE

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B16	11:59	:00	5%	PASSED

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

TEST

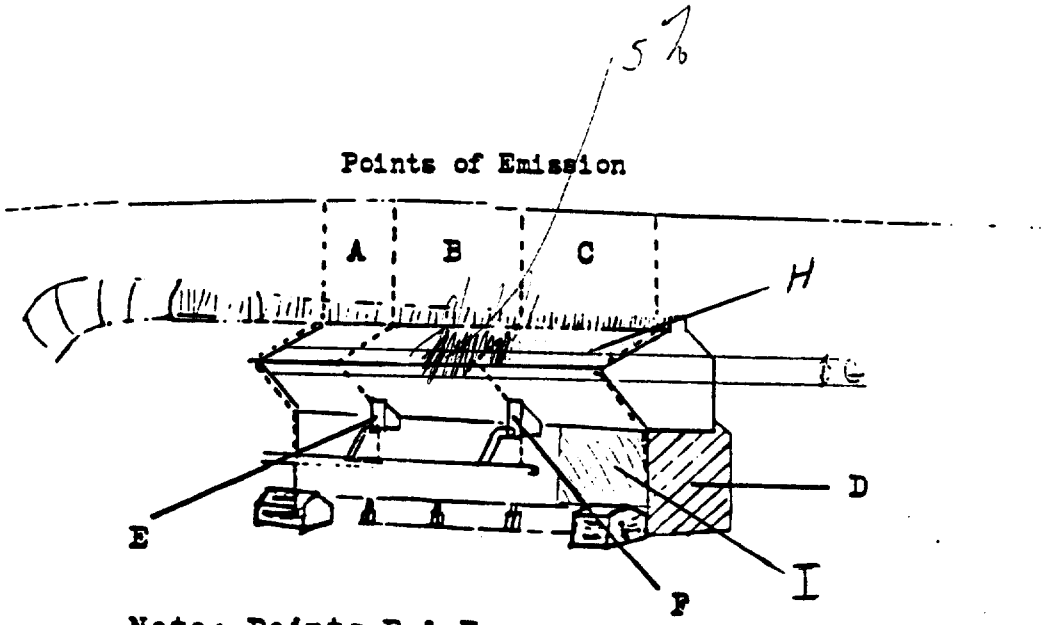
Name: DENNE

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A21	12:11	:00	5%	PASSED

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

TEST

Name: DENNE

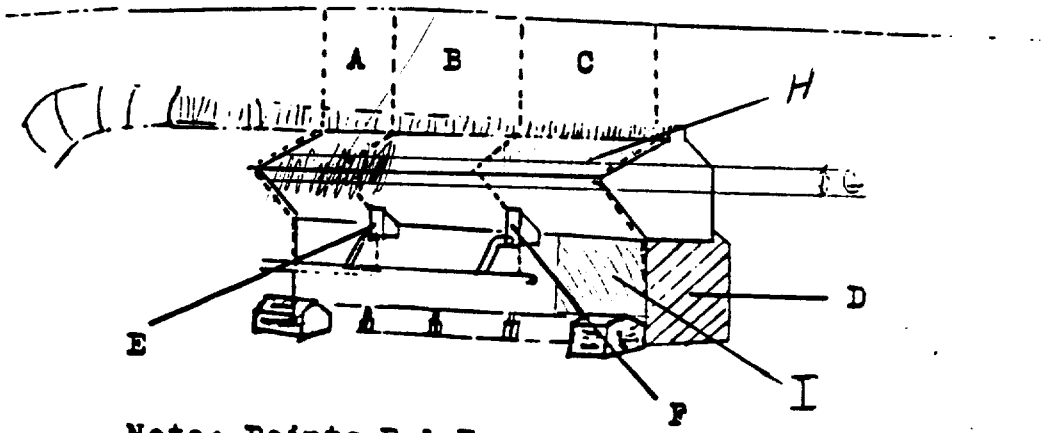
Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B21	12:22	:00	15%	PASSED

15%

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

TEST

Name: DENNE

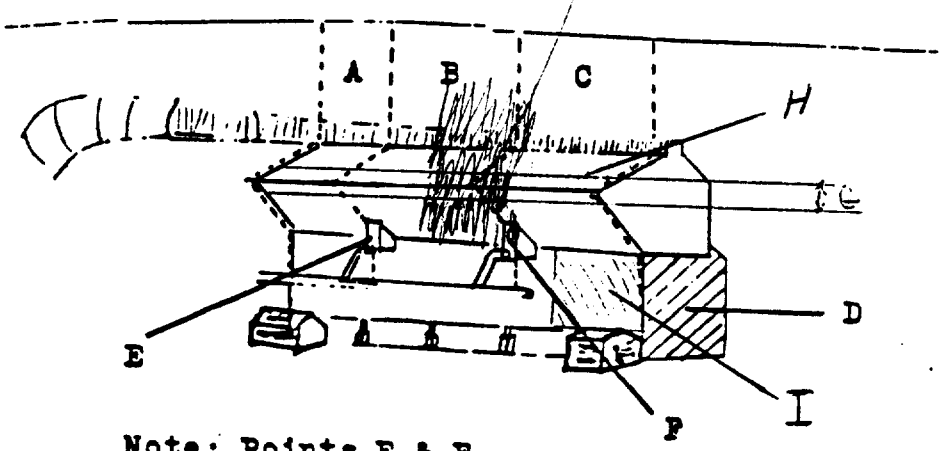
Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A26	12:33	:09	30%	

30%

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

TEST

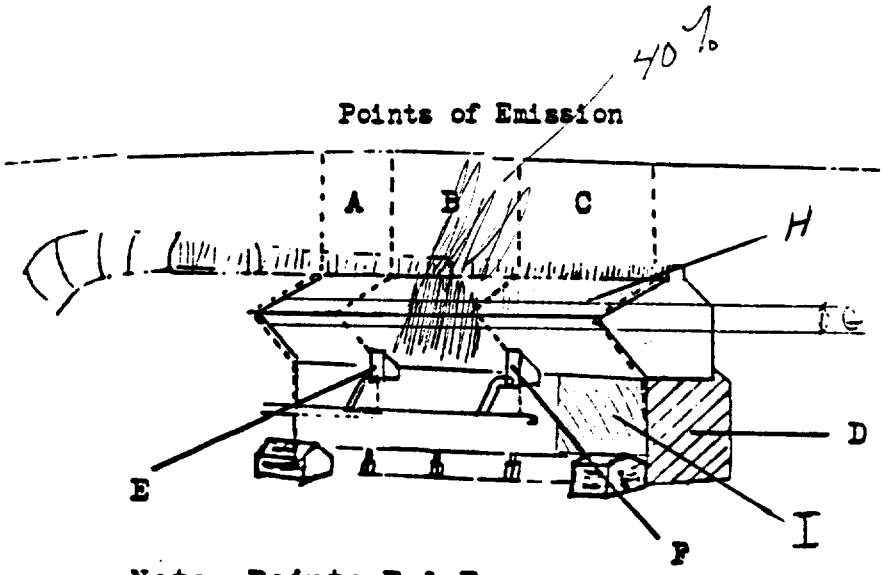
Name: DENOC

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A31	12:55	:35	40%	

Points of Emission



Note: Points E & F
Designate Doorways

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

"B" Battery Pushing

TEST

Name: DENNE

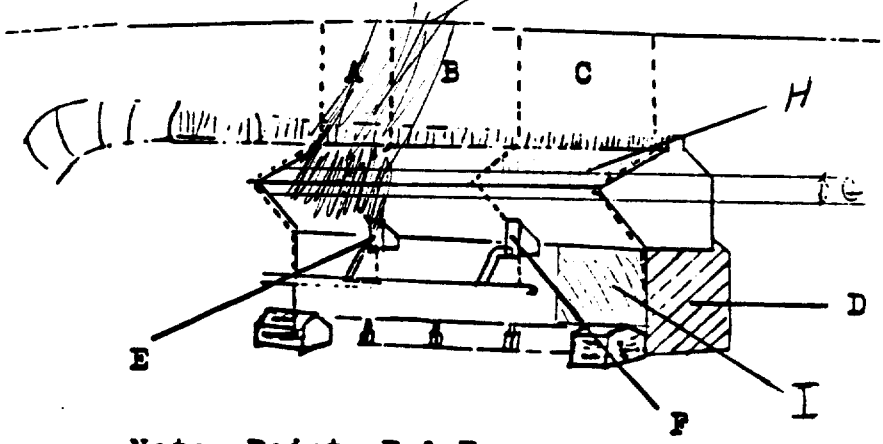
Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B26	12:42	:25	41 ?	

40 ft

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

1ST

Name: DENNE

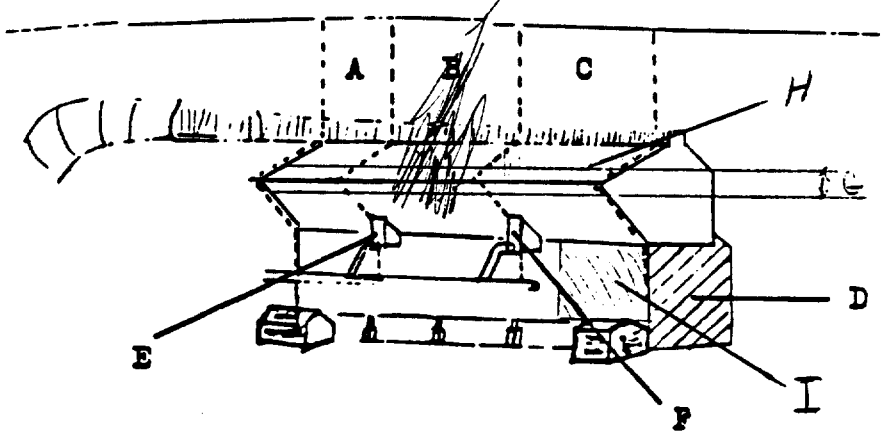
Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A36	13:26	:00	15%	PASSED

15%

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

TEST

Name: DENNE

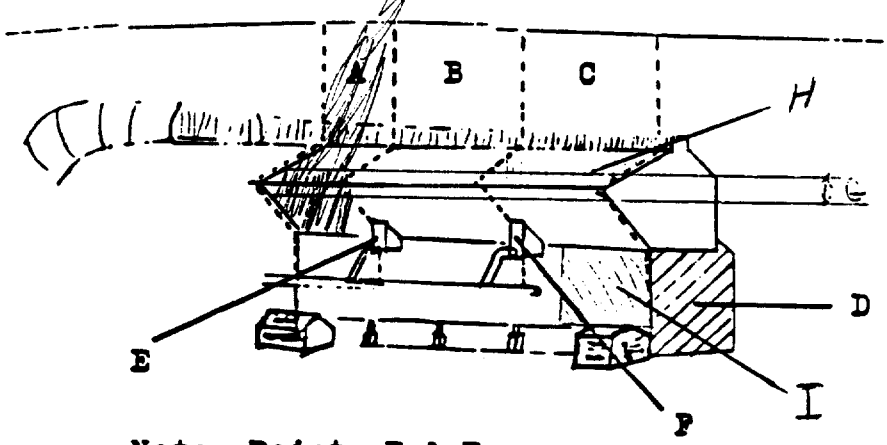
Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B31	13:16	: 11	40 %	

30%

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

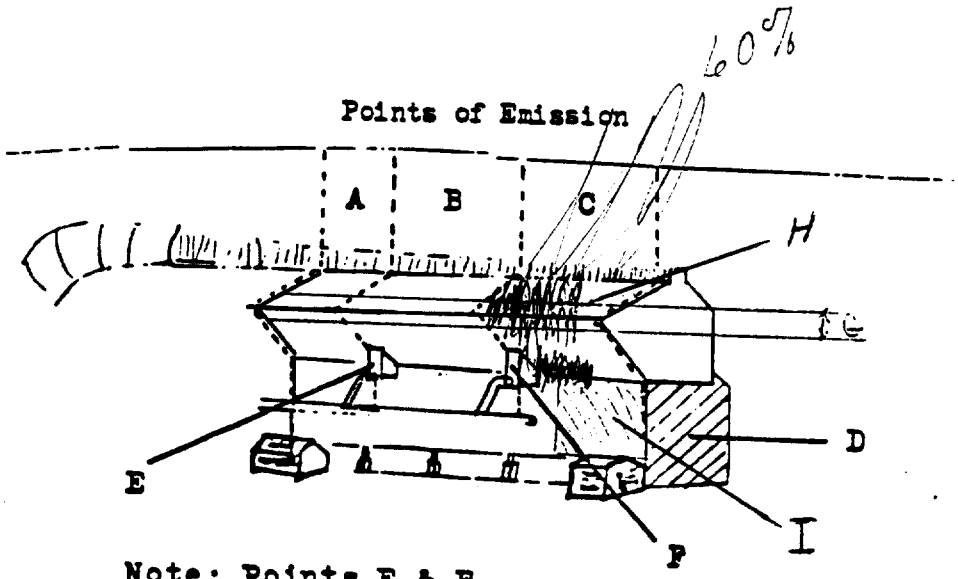
TEST

Name: DENNE

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A8	14:18	:71	60%	



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

Test

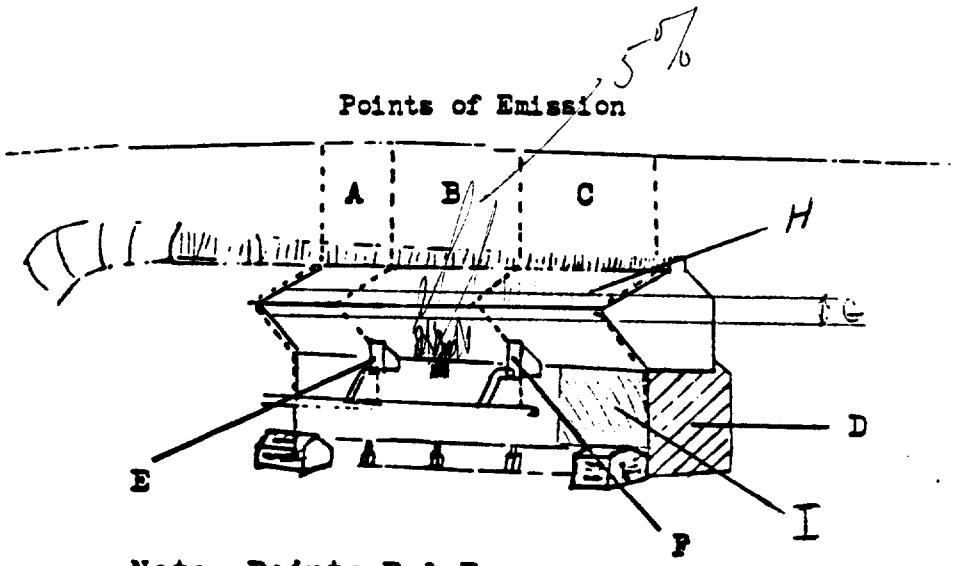
Name: DENNE

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
R3	14:08	:00	5%	PASSED

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

TEST

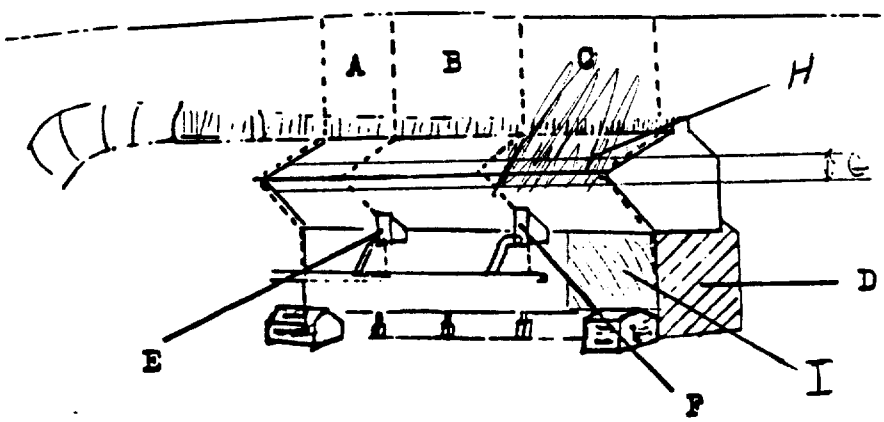
Name: DENNE

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A3	13:55	:00	15%	PASSED

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

TEST

Name: DINNI

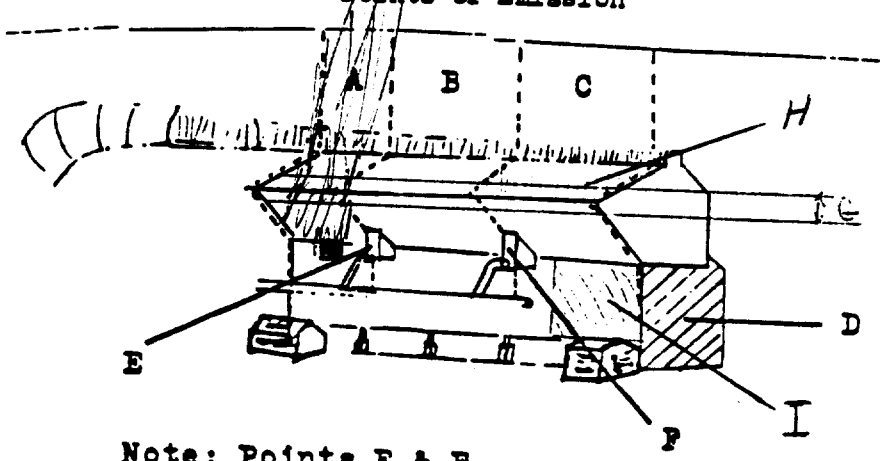
Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B36	13:39	:17	50%	

50%

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

TEST
STOP TEST
14:32

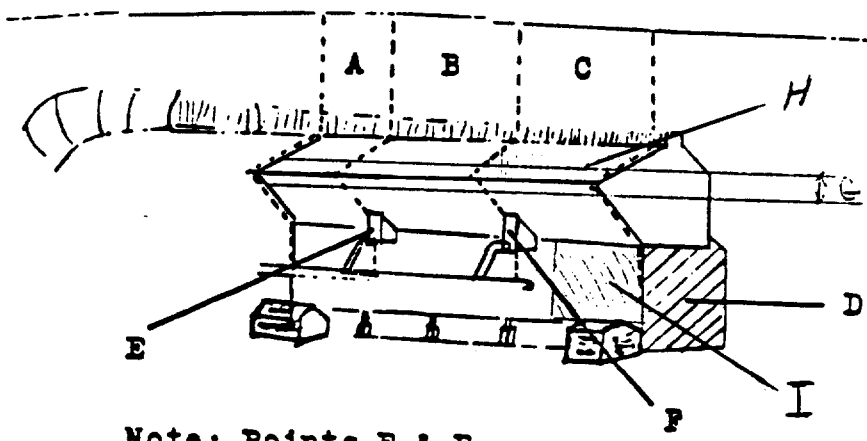
Name: DENNE

Date: 8-24-93

Foreman: KAPUSTA Crew: B

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B8	14:28	:00	0%	PASSED

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.

VISIBLE EMISSIONS OBSERVATIONS FORM

B - Baghouse STACK

B Battery - Baghouse Test #1 + #2 modules

OBSERVER: ~~Pat Mawson~~ Mark Hughes - City.

DATE: 10-6-93

FACILITY: USS-Clairton

OBSERVATION: START TIME: 11:15

END TIME: 12:15

OBSERVATION POINT:

Broadway St #3 Feeder Room

SOURCE:

DISTANCE: ~ 100 ft.

DIRECTION FROM: East

HEIGHT: ~80 ft.

WIND:

SPEED: 6 mph

DIRECTION: South

TEMPERATURE: 63°

SKY CONDITION: Clear

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: 0%

CREW: ____ FOREMAN: ____

COMMENTS:

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

VISIBLE EMISSIONS OBSERVATIONS FORM

Mark Hughes - cty. B-Baghouse STACK #1 + #2 Modules

OBSERVER: Pat Malone

DATE: 10-6-93

FACILITY: USS-Clairton

OBSERVATION: START TIME: 12:15

END TIME: 1:15

OBSERVATION POINT:

Roadway At #3 Feeder Room

SOURCE:

DISTANCE: ~ 100 ft.

DIRECTION FROM: East

HEIGHT: ~ 80 ft.

WIND:

SPEED: 6 mph

DIRECTION: South

TEMPERATURE: 63°

SKY CONDITION: Clear

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: ——

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: 0%

CREW: ____ FOREMAN: ____

COMMENTS: ____

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

VISIBLE EMISSIONS OBSERVATIONS FORM

B-Baghouse STACK #1 + #2 Modules

OBSERVER: Pat Marcum

DATE: 10-6-93

FACILITY: USS-Clairton

OBSERVATION: START TIME: 1:15

END TIME: 2:15

OBSERVATION POINT:

Roadway at #3 Feeder Room

SOURCE:

DISTANCE: ~100 ft.

DIRECTION FROM: East

HEIGHT: ~80 ft.

WIND:

SPEED: 6 mph

DIRECTION: SE

TEMPERATURE: 66°

SKY CONDITION: Clear

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 108

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: 0%

CREW: ____ FOREMAN: ____

COMMENTS:

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

"B" Battery Pushing

(TEST START 11:15)

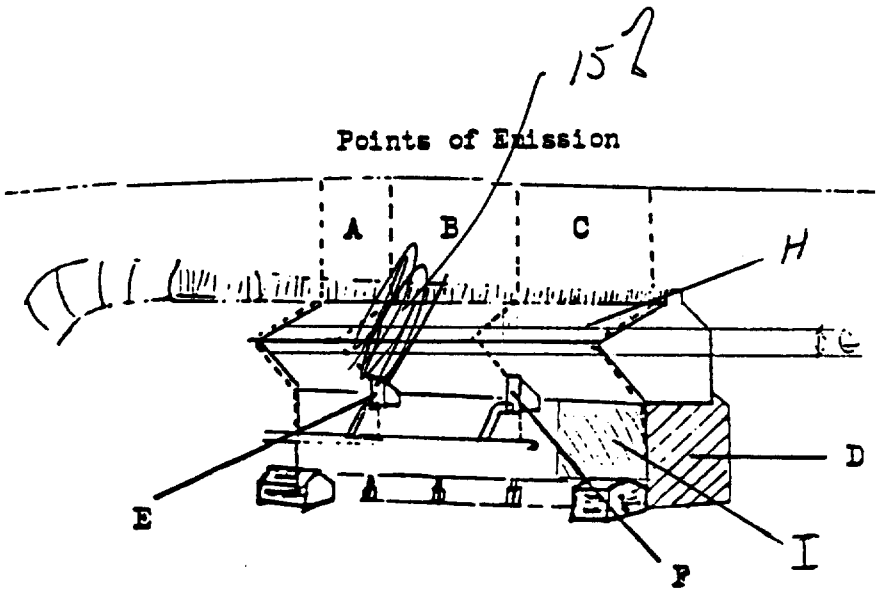
Name: DENNE

Date: 10-6-93

Foreman: KAPUSTA Crew: C

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B24	11:19	:00	15%	PASSED

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

TEST

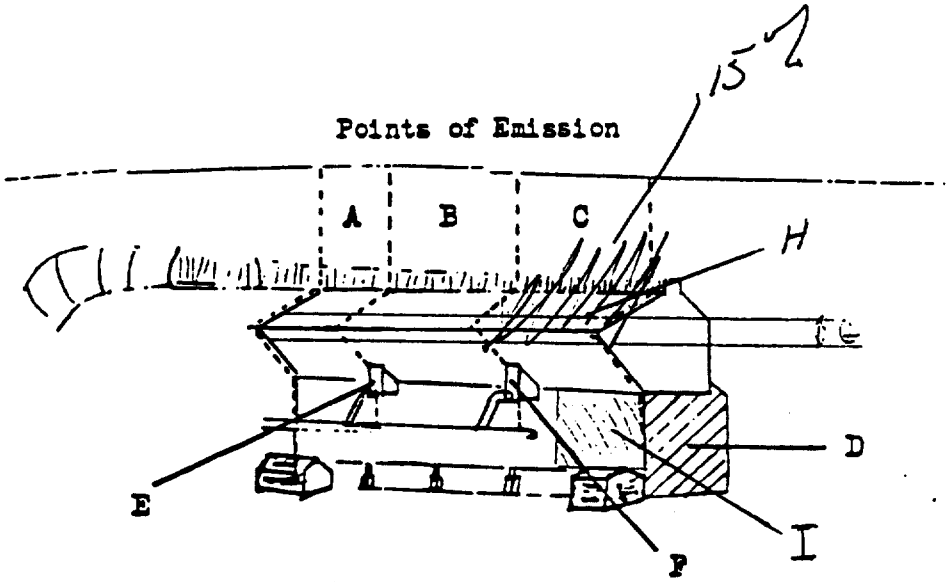
Name: DENNE

Date: 10-6-93

Foreman: KAPUSTA Crew: C

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A29	11:33	:00	15%	PASSED

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

TEST

Name: DENNE

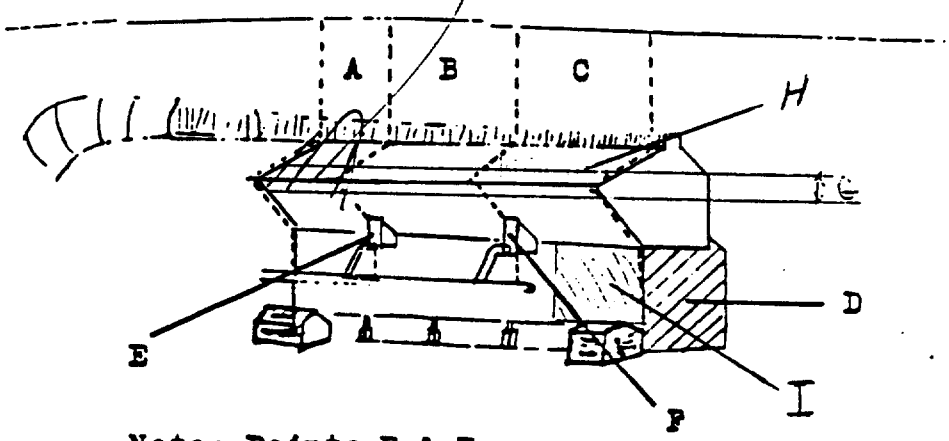
Date: 10-6-93

Foreman: KAPUSTA Crew: C

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B29	12:08	:00	5%	PASSED

5%

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: DENNIS

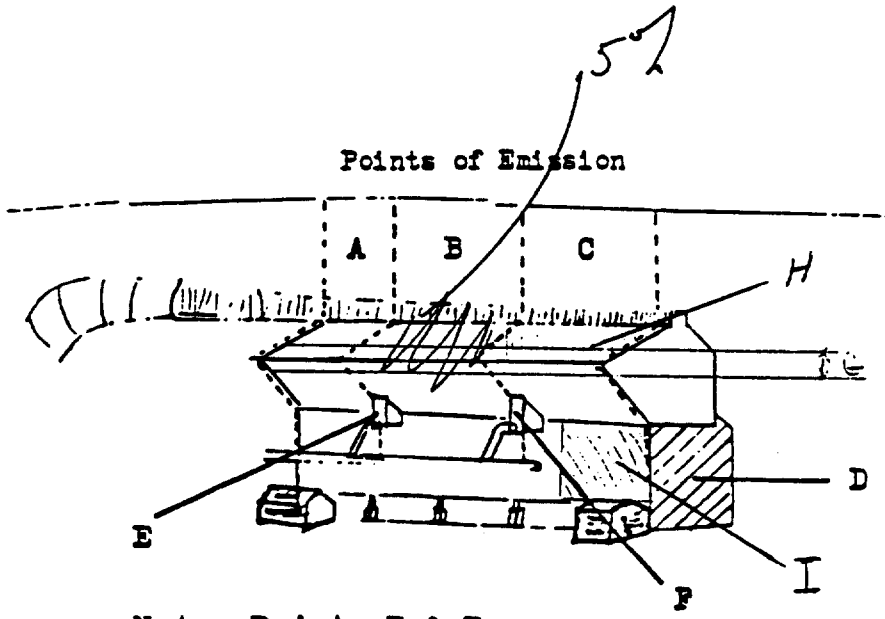
Date: 10-6-93

Foreman: KAPUSTA Crew: C

TEST

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A34	12:29	:00	5%	PASSED

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

TEST

Name: DENNE

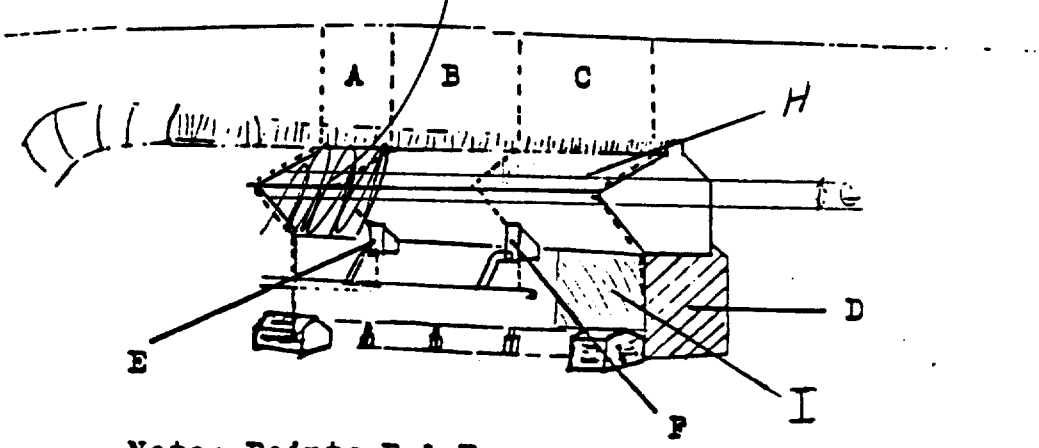
Date: 10-6-93

Foreman: KAPUJTA Crew: C

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
B34	12:50	:00	15%	PASSED

15%

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

TEST END 13:42

Name: DENNE

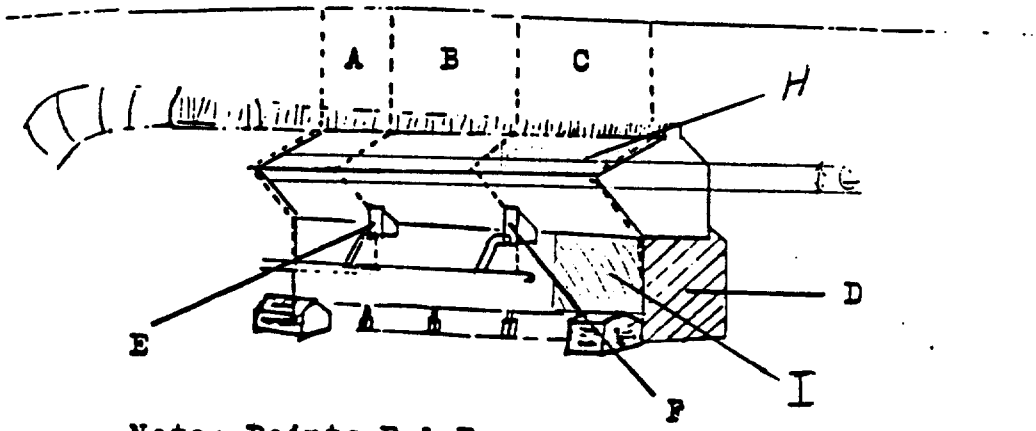
Date: 10-6-93

Foreman: KAPUSTA Crew: C

OVEN	TIME	1. PUSH Seconds Max. ≥ 20% Opac.		Areas of Emission &/or Comments
A1	13:02	:00	0%	PASSED
B1	13:16	:00	0%	PASSED
A6	13:26	:00	15%	PASSED - 15% AT AREA C
B6	13:36	:00	10%	PASSED - 10% AT AREA B
~~A11~~				
~~B1~~				
~~A16~~				
~~B16~~				

END 13:42

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.

COMPLIANCE DEMONSTRATION
B BATTERY BAGHOUSE

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX C

PLANT OPERATIONAL DATA

03.000.0088
1/85

PUSHING AND CHARGING REPORT

"B" BATTERY

B-PEC TEST

AM.

DATE 11-17-92

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
A1		A34		A6	
A6		A1		A11	
A11		A6		A16	
A16		A11		A21	
A21		A16		A26	
A26		A21		A31	
A31		A26		A36	
A36		A31		B3	
A3		A36		A8	
A8		A3		A13	
A13		A8		A18	
A18		A13		A23	
A23		A18		A28	
A28	559	A23	355	A33	
A33	613	A28	613	A38	
A38	634	A33	634	B5	
A5	646	B33	652	A10	
A10	715	A5	717	A15	
A15	737	A10	741	A20	
A20	815	A15	810	A25	
A25	842	A20	842	A30	
A30	917	A25	917	A35	
A35	947	A30	945	B2	
A2	1038	A35	1005	A7	
A7	1116	A2	1116	A12	
A12	1138	A7	1138	A17	
A17	1158	A12	1158	A22	
A22		A17		A27	
A27		A22		A32	
A32		A27		A37	
A37		A32		B4	
A4		A37		A9	
A9		A4		A14	
A14		A9		A19	
A19		A14		A24	
A24		A19		A29	
A29		A24		A34	
A34		A29		B1	

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
B1		B34		B6	
B6		B1		B11	
B11		B6		B16	
B16		B11		B21	
B21		B16		B26	
B26		B21		B31	
B31		B26		B36	
B36		B31			
B3		B36		B8	
B8		B3		B13	
B13		B8		B18	
B18		B13		B23	
B23		B18		B28	
B28	603	B23	406	B33	
B33	624	B28	624		
B5	704	A38	705	B10	
B10	725	B5	729	B15	
B15	750	B10	754	B20	
B20	831	B15	825	B25	
B25	911	B20	855	B30	
B30	940	B25	930	B35	
B35	1104	B30	1092		
B2	1052	B35	1121	B7	
B7	1128	B2	1128	B12	
B12	1148	B7	1148	B17	
B17		B12		B22	
B22		B17		B27	
B27		B22		B32	
B32		B27		B37	
B37		B32			
B4		B37		B9	
B9		B4		B14	
B14		B9		B19	
B19		B14		B24	
B24		B19		B29	
B29		B24		B34	
B34		B29			

TIME A.M.	P	C
12-1	0	0
1-2	0	0
2-3	0	0
3-4	0	1
4-5	0	1
5-6	1	0
6-7	5	4
7-8	5	5
8-9	3	4
9-10	4	3
10-11	2	2
11-12	6	6

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	C
12x8	11	11
8x4	15	15
4x12		
Total	26	26

[redacted]

12x8 [redacted]

8x4 -

4x12-

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

03.000.0088
1/85

PUSHING AND CHARGING REPORT

"B" BATTERY

PM. DATE 11-17-92

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
A1	628	A34	639	A6	
A6	653	A1	658	A11	
A11	723	A6	728	A16	
A16	748	A11	751	A21	
A21	815	A16	815	A26	
A26	840	A21	840	A31	
A31	922	A26	928	A36	
A36	934	A31	930	B3	
A3	959	A36	953	A8	
A8	1023	A3	1023	A13	
A13	1053	A8	1051	A18	
A18	1121	A13	1121	A23	
A23		A18		A28	
A28		A23		A33	
A33		A28		A38	
A38		A33		B5	
A5		B33		A10	
A10		A5		A15	
A15		A10		A20	
A20		A15		A25	23/23
A25		A20		A30	
A30		A25		A35	
A35		A30		B2	
A2		A35		A7	
A7		A2		A12	
A12		A7		A17	
A17		A12		A22	
A22	1222	A17	1225	A27	
A27	209	A22	1245	A32	
A32	235	A27	220	A37	
A37	259	A32	252	B4	
A4	323	A37	317	A9	
A9	345	A4	342	A14	
A14	414	A9	412	A19	
A19	437	A14	433	A24	
A24	527	A19	458	A29	
A29	546	A24	543	A34	
A34	607	A29	607	B1	

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
B1	638	B34	647	B6	
B6	712	B1	712	B11	
B11	734	B6	741	B16	
B16	759	B11	803	B21	
B21	830	B16	830	B26	
B26	850	B21	850	B31	
B31	917	B26	923	B36	
B36	945	B31	942		
B3	1015	B36	1011	B8	
B8	1039	B3	1039	B13	
B13	1107	B8	1102	B18	
B18	1135	B13	1134	B23	Lot of Rod Carbon
B23		B18		B28	
B28		B23		B33	
B33		B28			
B5		A38		B10	
B10		B5		B15	
B15		B10		B20	
B20		B15		B25	
B25		B20		B30	24/24
B30		B25		B35	
B35		B30			
B2		B35		B7	
B7		B2		B12	
B12		B7		B17	
B17	1210	B12	1212	B22	
B22	1230	B17	1233	B27	
B27	227	B22	1257	B32	
B32	249	B27	242	B37	
B37	309	B32	307		
B4	337	B37	330	B9	
B9	355	B4	350	B14	
B14	429	B9	424	B19	
B19	449	B14	442	B24	
B24	536	B19	533	B28	
B29	556	B24	553	B34	
B34	617	B29	618		

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	3	5
1-2	0	0
2-3	5	3
3-4	5	5
4-5	4	5
5-6	4	3
6-7	5	5
7-8	5	4
8-9	4	5
9-10	5	5
10-11	4	4
11-12	3	3

TOTALS	P	C
12x8		
6x4	13	13
4x12	34	34
Total	47	47
12x8		
8x4		
4x12		

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

AM
NOON
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
BR 55005
B
5D
11-17-92

12 NIGHT
1 A.M.
2 A.M.
5 A.M.
6 A.M.
7 A.M.
12 NOON
1 P.M.
2 P.M.
4 P.M.
5 P.M.
6 P.M.
7 P.M.
8 P.M.
11-17 92
BR 5002
Boas Cut
Poster Derrick

MIDNIGHT
Gas Cut
Risker Detail
Volume

03.000.0068
1/85

PUSHING AND CHARGING REPORT

"B" BATTERY

DATE 11-18-92

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
A1		A34		A6	
A6		A1		A11	
A11		A6		A16	
A16		A11		A21	
A21		A16		A26	
A26		A21		A31	
A31		A26		A36	
A36		A31		B3	
A3		A36		A8	
A8		A3		A13	
A13		A8		A18	
A18		A13		A23	
A23	1208	A18	1212	A28	
A28	1241	A23	1239	A33	
A33	104	A28	102	A38	
A38	138	A33	126	B5	
A5	154	B33	136	A10	
A10	232	A5	212	A15	
A15	252	A10	250	A20	
A20	316	A15	314	A25	
A25	336	A20	336	A30	
A30	403	A25	403	A35	
A35	422	A30	423	B2	
A2	451	A35	449	A7	
A7	515	A2	514	A12	
A12	548	A7	548	A17	
A17	611	A12	611	A22	
A22	639	A17	639	A27	
A27	707	A22	707	A32	
A32	735	A27	735	A37	
A37	8:35	A32	8:35	B4	
A4	9:30	A37	8:59	A9	
A9	9:35	A4	9:35	A14	
A14	10:30	A9	10:35	A19	
A19	11:16	A14	11:03	A24	
A24	11:44	A19	11:41	A29	
A29		A24		A34	
A34		A29		B1	

24

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
B1		B34		B6	
B6		B1		B11	
B11		B6		B16	
B16		B11		B21	
B21		B16		B26	
B26		B21		B31	
B31		B26		B36	
B36		B31			
B3		B36		B8	
B8		B3		B13	
B13		B8		B18	
B18		B13		B23	
B23	1227	B18	1227	B28	
B28	1253	B23	1251	B33	
B33	115	B28	113		
B5	204	A38	152	B10	
B10	243	B5	223	B15	
B15	306	B10	301	B20	
B20	326	B15	324	B25	
B25	347	B20	351	B30	
B30	415	B25	413	B35	
B35	434	B30	439		
B2	544	B35	500	B7	
B7	528	B2	528	B12	
B12	557	B7	557	B17	
B17	625	B12	625	B22	
B22	653	B17	653	B27	
B27	721	B22	721	B32	
B32	8:10	B27	8:10	B37	
B37	8:45	B32	8:40		
B4	9:25	B37	9:20	B9	
B9	10:30	B4	9:45	B14	
B14	10:59	B9	10:50	B19	
B19	11:34	B14	11:15	B24	
B24	11:59	B19	11:56	B29	
B29		B24		B34	
B34		B29			

23

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

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	C
12x8	34	34
8x4	13	13
4x12		
Total	47	47

FOREMAN

12x8 [illegible]

8x4 -

4x12-

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

03.000.0088
1/85

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PUSHING AND CHARGING REPORT

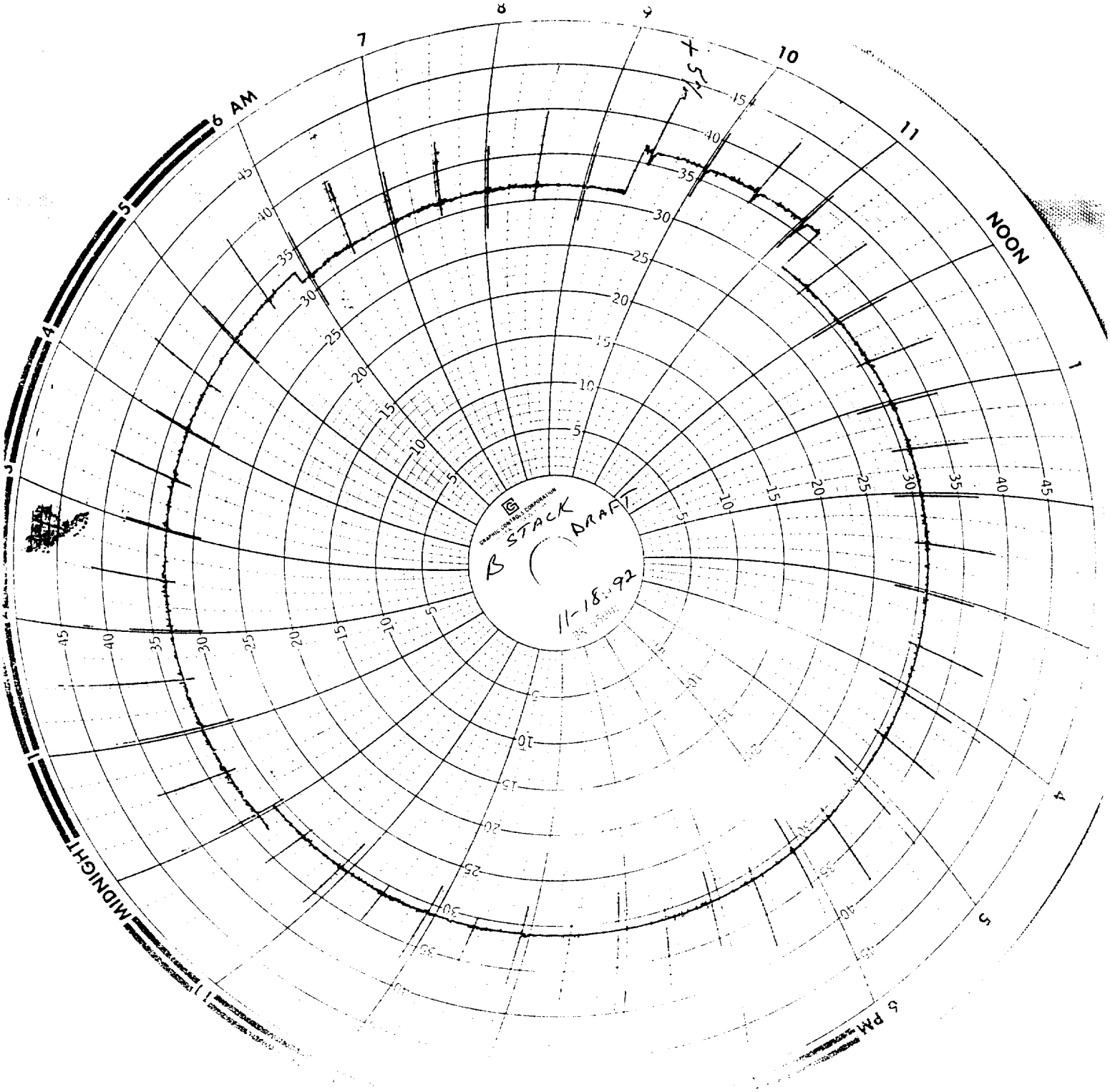
"B" BATTERY

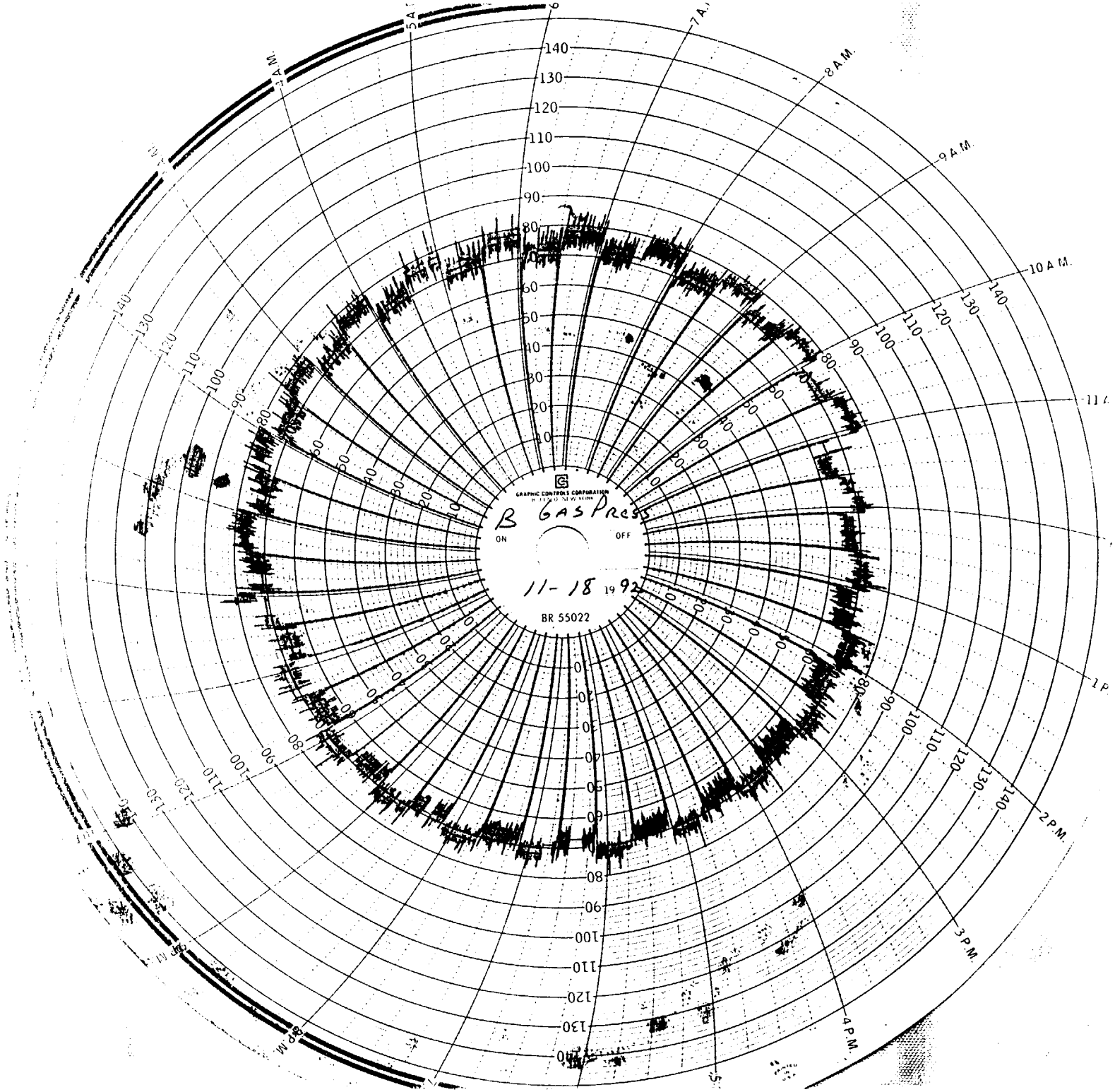
DATE 11-18-92

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	TIME A.M.	P	C
A1	105	A34	105	A6		B1	120	B34	120	B6		12-1		
A6	135	A1	135	A11		B6	150	B1	150	B11		1-2		
A11	202	A6	203	A16		B11	212	B6	212	B16		2-3		
A16	225	A11	225	A21		B16	240	B11	240	B21		3-4		
A21	252	A16	252	A26		B21	—	B16	307	B26		4-5		
A26	309	A21	312	A31		B26	325	B21	—	B31		5-6		
A31	335	A26	335	A36		B31	345	B26	345	B36		6-7		
A36	355	A31	355	B3		B36	405	B31	405			7-8		
A3	418	A36	418	A8		B3	430	B36	430	B8		8-9		
A8	442	A3	442	A13		B8	457	B3	457	B13		9-10		
A13	510	A8	510	A18		B13	525	B8	525	B18		10-11		
A18	540	A13	540	A23		B18	552	B13	552	B23		11-12		
A23	605	A18	605	A28		B23	620	B18	620	B28				
A28	630	A23	630	A33		B28	645	B23	645	B33		TIME P.M.	P	C
A33	659	A28	659	A38		B33	712	B28	712			12-1	4	4
A38	733	A33	723	B5								1-2	4	4
A5	745	B33	745	A10		B5	757	A38	757	B10		2-3	5	5
A10	812	A5	812	A15		B10	825	B5	825	B15		3-4	5	5
A15	837	A10	837	A20		B15	849	B10	849	B20		4-5	5	5
A20	904	A15	904	A25		B20	914	B15	914	B25		5-6	4	4
A25	924	A20	924	A30		B25	937	B20	937	B30		6-7	5	5
A30	1006	A25	1006	A35		B30	1020	B25	1030	B35		7-8	4	4
A35	1032	A30	1032	B2		B35	1053	B30	1053			8-9	4	4
A2	1102	A35	1107	A7		B2	1120	B35	1120	B7		9-10	4	4
A7	1135	A2	1135	A12		B7		B2		B12		10-11	4	4
A12		A7		A17		B12		B7		B17		11-12	3	3
A17		A12		A22		B17		B12		B22		TOTALS		
A22		A17		A27		B22		B17		B27			P	C
A27		A22		A32		B27		B22		B32		12x8		
A32		A27		A37		B32		B27		B37		8x4	18	18
A37		A32		B4		B37		B32				4x12	33	33
A4		A37		A9		B4		B37		B9		Total	51	51
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 - Sowder		
A29	1210	A24	1210	A34		B29	1220	B24	1220	B34		8x4 -		
A34	1235	A29	1235	B1		B34	1250	B29	1250			4x12-		
	27		27				24		24					

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

NOON
1
2
3
6 PM
7
8
9
10
11
MIDNIGHT
1
2
3
6 AM
7
8
9
10
11
900
800
700
600
500
400
300
200
100
Volume


MIDNIGHT
1
2
3
4
5
6 AM
7
8
9
10
11
NOON
1
2
3
4
5
6 PM
B STACK DRAFT
11-18-92
GRAPHIC CONTROLS CORPORATION


GRAPHIC CONTROLS CORPORATION
B GAS PRESS
ON
OFF
11-18 1992
BR 55022
6
7 A.M.
8 A.M.
9 A.M.
10 A.M.
1 P.M.
2 P.M.
3 P.M.
4 P.M.
5 P.M.
6 P.M.

.000.0088
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PUSHING AND CHARGING REPORT

"B" BATTERY

DATE 8-24-93

AM

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
A1	925	A34	917	A6		B1	607	B34	935	B6	
A6	1040	A1	1015	A11		B6	1050	B1	1050	B11	
A11	1110	A6	1100	A16		B11	1122	B6	1117	B16	
A16	1137	A11	1152	A21		B16	1158	B11		B21	
A21		A16		A26		B21		B16		B26	
A26		A21		A31		B26		B21		B31	
A31		A26		A36		B31		B26		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	1212	A15	1212	A25		B20	1223	B15	1224	B25	
A25	1255	A20	1240	A30		B25	105	B20	105	B30	
A30	115	A25	115	A35		B30	135	B25	125	B35	
A35	145	A30	135	B2		B35	155	B30	153		
A2	209	A35	205	A7		B2	222	B35	218	B7	
A7	233	A2	233	A12		B7	246	B2	244	B12	
A12	258	A7	254	A17		B12	305	B7	307	B17	
A17	315	A12	317	A22		B17	330	B12	327	B22	
A22	343	A17	347	A27		B22	355	B17	353	B27	
A27	405	A22	405	A32		B27	418	B22	417	B32	
A32	432	A27	430	A37		B32	446	B27	442	B37	
A37	500	A32	500	B4		B37	514	B32	512		
A4	528	A37	524	A9		B4	542	B37	538	B9	
A9	557	A4	552	A14		B9	611	B4	608	B14	
A14	625	A9	622	A19		B14	639	B9	636	B19	
A19	653	A14	650	A24		B19	707	B14	705	B24	
A24	721	A19	718	A29		B24	735	B19	730	B29	
A29	815	A24	813	A34		B29	835	B24	825	B34	
A34	845	A29	845	B1		B34	904	B29	901		

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

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	C
12x8	34	34
8x4	12	11
4x12		
Total		

FOREMAN

12x8 SMITH

8x4 - M. Cockle

4x12-

23 23/22

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

03.000.0088
1/85

PUSHING AND CHARGING REPORT

"B" BATTERY

DATE 8-29-93

P. M.

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
A1		A34		A6	
A6		A1		A11	
A11		A6		A16	
A16		A11		A21	
A21	1209	A16	1215	A26	
A26	1232	A21	1236	A31	
A31	1254	A26	1255	A36	
A36	125	A31	123	B3	
A3	159	A36	148	A8	
A8	217	A3	219	A13	
A13	236	A8	235	A18	
A18	257	A13	251	A23	
A23	317	A18	315	A28	
A28	336	A23	339	A33	
A33	414	A28	411	A38	
A38	432	A33	433	B5	
A5	442	B33	449	A10	
A10	501	A5	510	A15	
A15	539	A10	532	A20	
A20	559	A15	559	A25	
A25	627	A20	628	A30	
A30	655	A25	655	A35	
A35	721	A30	721	B2	
A2	750	A35	745	A7	
A7	818	A2	818	A12	
A12	846	A7	846	A17	
A17	917	A12	916	A22	
A22	942	A17	942	A27	
A27	1017	A22	1011	A32	
A32	1042	A27	1032	A37	
A37	1101	A32	1107	B4	
A4	1132	A37	1135	A9	
A9		A4		A14	
A14		A9		A19	
A19		A14		A24	
A24		A19		A29	
A29		A24		A34	
A34		A29		B1	

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
B1		B34		B6	
B6		B1		B11	
B11		B6		B16	
B16		B11	1205	B21	
B21	1222	B16	1226	B26	
B26	1241	B21	1247	B31	
B31	115	B26	106	B36	
B36	137	B31	132		
B3	206	B36	201	B8	
B8	226	B3	225	B13	
B13	247	B8	245	B18	
B18	307	B13	305	B23	
B23	325	B18	323	B28	
B28	348	B23	346	B33	
B33	423	B28	423		
B5	451	A38	459	B10	
B10	530	B5	529	B15	
B15	549	B10	55	B20	
B20	613	B15	612	B25	
B25	640	B20	639	B30	
B30	707	B25	707	B35	
B35	735	B30	735		
B2	804	B35	801	B7	
B7	832	B2	832	B12	
B12	900	B7	900	B17	
B17	930	B12	928	B22	
B22	952	B17	951	B27	
B27	1020	B22	1022	B32	
B32	1052	B27	1053	B37	
B37	112	B32	112		
B4		B37		B9	
B9		B4		B14	
B14		B9		B19	
B19		B14		B24	
B24		B19		B29	
B29		B24		B34	
B34		B29			

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	6
1-2	4	4
2-3	6	6
3-4	5	5
4-5	5	5
5-6	5	5
6-7	4	4
7-8	4	4
8-9		
9-10		
10-11	1	1
11-12	3	3

TOTALS	P	C
12x8		
8x4	50	51
4x12	34	34
Total	54	55

FOREMAN

12x8 -

8x4 - McCoble

4x12- [illegible]

25 25 26 27

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

Tuesday, August 24, 1993 Turn [illegible]
Battery: B

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	A2[illegible]	34:11	3:50pm	4:00pm	4:1[illegible]pm
2	B2[illegible]	34:11	4:04pm	4:14pm	4:24pm
3	A3[illegible]	34:10	4:18pm	4:28pm	4:38pm
4	B3[illegible]	34:10	4:32pm	4:42pm	4:52pm
5	A[illegible]	34:10	4:46pm	4:56pm	5:06pm
6	B[illegible]	34:09	5:0[illegible]pm	5:10pm	5:20pm
7	A[illegible]	34:08	5:1[illegible]pm	5:24pm	5:34pm
8	B[illegible]	34:08	5:23pm	5:33pm	5:49pm
9	A2	34:07	5:42pm	5:52pm	6:12pm
10	B2	34:07	5:57pm	6:07pm	6:17pm
11	A7	34:06	6:11pm	6:21pm	6:31pm
12	B7	33:50	6:25pm	6:35pm	6:45pm
13	A12	33:49	6:39pm	6:49pm	6:59pm
14	B12	33:48	6:53pm	7:03pm	7:13pm
15	A17	33:47	7:07pm	7:17pm	7:27pm
16	B17	33:46	7:21pm	7:31pm	7:41pm
17	A22	33:45	7:35pm	7:45pm	7:55pm
18	B22	33:45	7:50pm	8:00pm	8:10pm
19	A27	33:44	8:04pm	8:14pm	8:24pm
20	B27	33:43	8:18pm	8:28pm	8:38pm
21	A32	33:42	8:32pm	8:42pm	8:52pm
22	B32	33:41	8:46pm	8:56pm	9:06pm
23	A37	33:40	9:00pm	9:10pm	9:20pm
24	B37	33:39	9:14pm	9:24pm	9:34pm
25	A4	33:38	9:28pm	9:38pm	9:48pm
26	B4	33:37	9:42pm	9:52pm	10:02pm
27	A9	33:37	9:57pm	10:07pm	10:17pm
28	B9	33:36	10:11pm	10:21pm	10:31pm
29	A14	33:35	10:25pm	10:35pm	10:45pm
30	B14	33:34	10:39pm	10:49pm	10:59pm
31	A19	33:33	10:53pm	11:03pm	11:13pm
32	B19	33:32	11:07pm	11:17pm	11:27pm
33	A24	33:31	11:21pm	11:31pm	11:41pm
34	B24	33:30	11:35pm	11:45pm	11:55pm

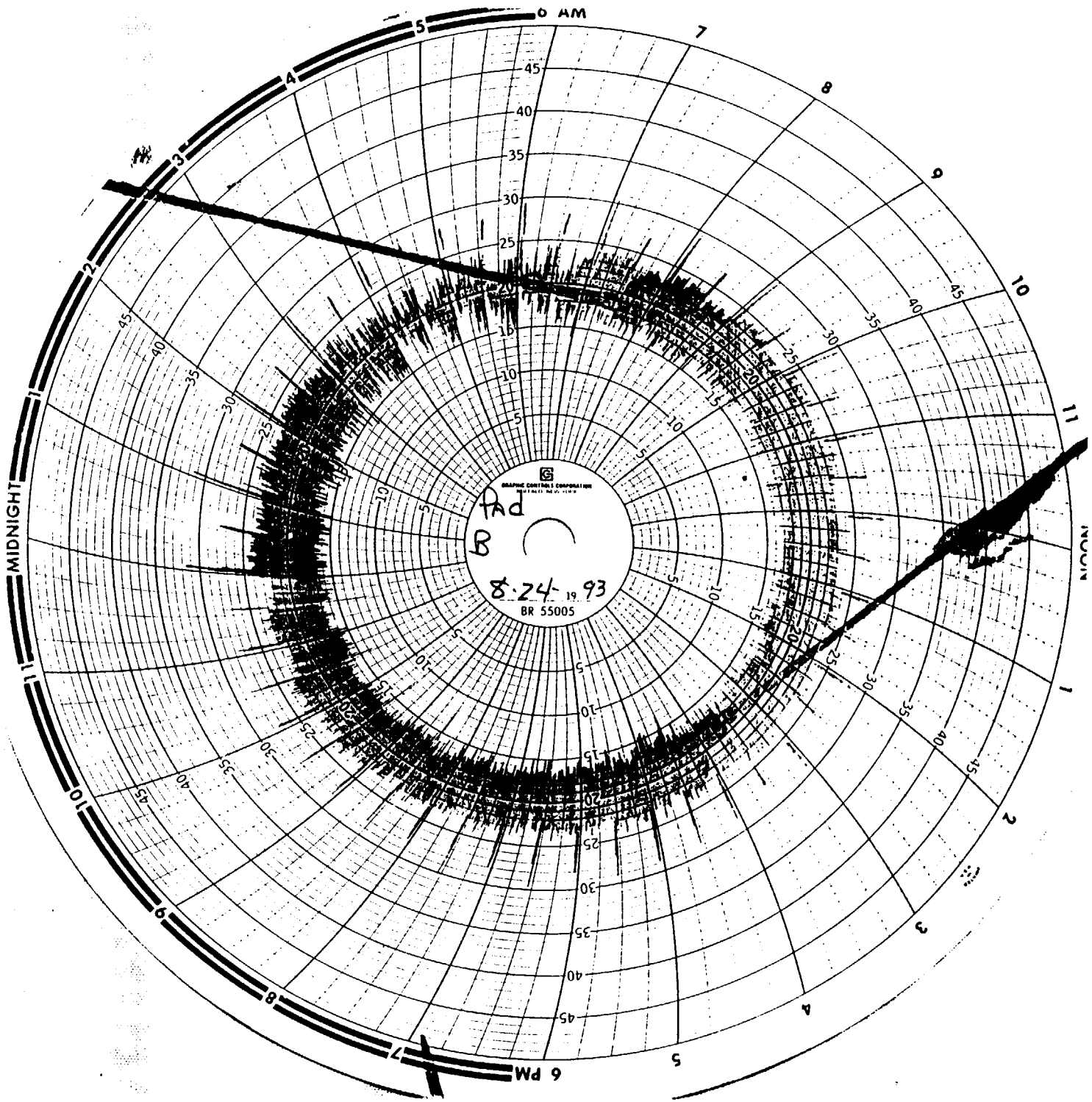
PUSHING SCHEDULE

Tuesday, August 24, 1993 Turn 2
Battery: B

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	A29	17:33	7:50am	8:00am	8:25am
2	B29	17:30	8:05am	8:15am	8:40am
3	A34	17:30	8:20am	8:30am	8:55am
4	B34	17:30	8:35am	8:45am	9:10am
5	A1	17:30	8:50am	9:00am	9:25am
6	B1	17:30	9:05am	9:15am	9:40am
7	A6	17:30	9:20am	9:30am	9:55am
8	B6	17:31	9:35am	9:45am	10:10am
9	A11	17:32	9:50am	10:00am	10:25am
10	B11	17:33	10:05am	10:15am	10:40am
11	A16	17:34	10:20am	10:30am	10:55am
12	B16	17:35	10:35am	10:45am	11:10am
13	A21	17:36	10:50am	11:00am	11:25am
14	B21	17:37	11:05am	11:15am	11:40am
15	A26	17:38	11:20am	11:30am	11:55am
16	B26	17:36	11:35am	11:45am	12:10pm
17	A31	17:39	11:50am	12:00pm	12:25pm
18	B31	17:40	12:05pm	12:15pm	12:40pm
19	A36	17:41	12:20pm	12:30pm	12:55pm
20	B36	17:42	12:35pm	12:45pm	1:10pm
21	A3	17:43	12:50pm	1:00pm	1:25pm
22	B3	17:44	1:05pm	1:15pm	1:40pm
23	A8	17:45	1:20pm	1:30pm	1:55pm
24	B8	17:45	1:35pm	1:45pm	2:10pm
25	A13	17:46	1:50pm	2:00pm	2:25pm
26	B13	17:47	2:05pm	2:15pm	2:40pm
27	A18	17:48	2:20pm	2:30pm	2:55pm
28	B18	17:49	2:35pm	2:45pm	3:10pm
29	A23	17:50	2:50pm	3:00pm	3:25pm
30	B23	17:51	3:05pm	3:15pm	3:40pm
31	A28	17:52	3:20pm	3:30pm	3:55pm
32	B28	17:53	3:35pm	3:45pm	4:10pm

Tuesday, August 24, 1993 Turn 3
Battery: B

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	A33	17:53	3:50pm	4:00pm	4:10pm
2	B33	17:53	4:04pm	4:14pm	4:24pm
3	A38	17:53	4:18pm	4:28pm	4:38pm
4	A5	17:53	4:32pm	4:42pm	4:52pm
5	B5	17:53	4:46pm	4:56pm	5:06pm
6	A10	31:40	5:00pm	5:10pm	5:20pm
7	B10	18:07	5:14pm	5:24pm	5:34pm
8	A15	18:07	5:28pm	5:38pm	5:48pm
9	B15	18:07	5:42pm	5:52pm	6:02pm
10	A20	36:18	5:57pm	6:07pm	6:17pm
11	B20	36:18	6:11pm	6:21pm	6:31pm
12	A25	36:17	6:25pm	6:35pm	6.45pm
13	B25	36:17	6:39pm	6:49pm	6:59pm
14	A30	36:16	6:53pm	7:03pm	7:13pm
15	B30	36:16	7:07pm	7:17pm	7:27pm
16	A35	36:15	7:21pm	7:31pm	7:41pm
17	B35	36:15	7:35pm	7:45pm	7:55pm
18	A2	36:15	7:50pm	8:00pm	8:10pm
19	B2	2:07	8:04pm	8:14pm	8:24pm
20	A7	2:07	8:18pm	8:28pm	8:38pm
21	B7	2:07	8:32pm	8:42pm	8:52pm
22	A12	2:07	8:46pm	8:56pm	9:06pm
23	B12	2:07	9:00pm	9:10pm	9:20pm
24	A17	2:07	9:14pm	9:24pm	9:34pm
25	B17	2:07	9:28pm	9:38pm	9:48pm
26	A22	2:07	9:42pm	9:52pm	10:02pm
27	B22	2:07	9:57pm	10:07pm	10:17pm
28	A27	2:07	10:11pm	10:21pm	10:31pm
29	B27	2:07	10:25pm	10:35pm	10:45pm
30	A32	2:07	10:39pm	10:49pm	10:59pm
31	B32	2:07	10:53pm	11:03pm	11:13pm
32	A37	2:07	11:07pm	11:17pm	11:27pm
33	B37	2:07	11:21pm	11:31pm	11:41pm
34	A4	2:07	11:35pm	11:45pm	11:55pm


6 PM
7
8
9
10
11
MIDNIGHT
1
2
3
4
5
6 AM
Pad
B
8-24- 19 93
BR 55005

6 PM
NOON
6 AM
8 · 24 · 93
RR 55121

1 A.M.
2 A.M.
3 A.M.
4 A.M.
5 A.M.
6 A.M.
7 A.M.
8 A.M.
9 A.M.
10 A.M.
11 A.M.
12 NOON
140
130
120
110
100
90
80

NOON
6 PM
MIDNIGHT
6 AM
BR 55005

6 PM
NOON
6 AM
BR 55005
8-24-93

03.000.0088
1/85

PUSHING AND CHARGING REPORT

"B" BATTERY

"A.M." DATE 10-6-93

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	5	5
A6		A1		A11		B6		B1		B11		1-2	5	5
A11		A6		A16		B11		B6		B16		2-3	4	4
A16		A11		A21		B16		B11		B21		3-4	4	4
A21		A16		A26		B21		B16		B26		4-5	4	4
A26		A21		A31	MADE 2 PASSES A26	B26		B21		B31		5-6	4	4
A31		A26		A36		B31		B26		B36		6-7	4	5
A36		A31		B3		B36		B31				7-8	4	3
A3		A36		A8		B3		B36		B8		8-9	3	2
A8		A3		A13		B8		B3		B13		9-10	5	5
A13		A8		A18		B13		B8		B18		10-11	3	1
A18		A13		A23		B18		B13		B23		11-12	2	3
A23		A18		A28		B23		B18		B28				
A28		A23		A33		B28	1:05	B23	1:08	B33		TIME P.M.	P	C
A33	1:17	A28	1:21	A38		B33	1:30	B28	1:33			12-1		
A38	1:43	A33	1:46	B5								1-2		
A5	1:54	B33	1:58	A10		B5	1:07	A38	1:10	B10		2-3		
A10	1:19	A5	1:22	A15		B10	1:31	B5	1:34	B15		3-4		
A15	1:44	A10	1:46	A20		B15	1:56	B10	1:58	B20		4-5		
A20	2:13	A15	2:14	A25		B20	2:16	B15	2:17	B25		5-6		
A25	2:40	A20	2:41	A30		B25	2:56	B20	2:57	B30		6-7		
A30	3:10	A25	3:09	A35		B30	3:34	B25	3:36	B35		7-8		
A35	3:38	A30	3:36	B2	BOTTOM NEEDS CUT A35	B35	3:53	B30	3:51			8-9		
A2	4:08	A35	4:03	A7		B2	4:23	B35	4:18	B7		9-10		
A7	4:37	A2	4:35	A12		B7	4:52	B2	4:50	B12		10-11		
A12	5:07	A7	5:05	A17		B12	5:20	B7	5:20	B17		11-12		
A17	5:37	A12	5:35	A22		B17	5:52	B12	5:50	B22		TOTALS		
A22	6:03	A17	6:03	A27		B22	6:19	B17	6:17	B27			P	C
A27	6:33	A22	6:31	A32		B27	6:46	B22	6:44	B32		12x8	34	34
A32	7:39	A27	6:55	A37		B32	7:00	B27	7:02	B37		8x4	11	11
A37	7:15	A32	7:15	B4	M/T PATCHER	B37	7:27	B32	7:28			4x12	—	—
A4	8:25	A37	7:43	A9		B4	8:40	B37	8:35	B9		Total	45	45
A9	9:50	A4	8:48	A14		B9	9:11	B4	9:09	B14				
A14	9:22	A9	9:22	A19		B14	9:40	B9	9:35	B19				
A19	10:27	A14	9:43	A24		B19	10:46	B14	9:57	B24		FOREMAN		
A24	10:56	A19	10:56	A29		B24	11:19	B19	11:19	B29		12x8 -		
A29	11:36	A24	11:36	A34		B29		B24		B34		8x4 -		
A34		A29		B1		B34		B29				4x12-		

23 / 23 22 / 22

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

03.000.0088
1/85

PUSHING AND CHARGING REPORT

"B" BATTERY "PM"

DATE 10-6-93

PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS	PUSH		CHARGE		CLEAN CHUCK DOOR	COMMENTS
A1	1 04	A34	1 20	A6		B1	1 15	B34	1 12	B6	
A6	1 16	A1	1 25	A11		B6	1 36	B1	1 35	B11	
A11	1 46	A6	1 44	A16		B11	1 57	B6	1 58	B16	
A16	2 08	A11	2 08	A21		B16	2 16	B11	2 21	B21	
A21	2 29	A16	2 33	A26		B21	2 36	B16	2 43	B26	
A26	2 48	A21	2 53	A31		B26	3 03	B21	3 09	B31	
A31	3 15	A26	3 20	A36		B31	3 28	B26	3 30	B36	
A36	3 45	A31	3 45	B3		B36	4 07	B31	4 22		
A3	4 38	A36	4 40	A8		B3	4 50	B36	4 53	B8	
A8	5 00	A3	5 01	A13		B8	5 09	B3	5 11	B13	
A13	5 18	A8	5 21	A18		B13	5 32	B8	5 33	B18	
A18	5 40	A13	5 50	A23		B18	5 53	B13	5 59	B23	
A23	6 05	A18	6 10	A28		B23	6 15	B18	6 20	B28	
A28	6 28	A23	6 30	A33		B28	6 41	B23	6 43	B33	
A33	6 53	A28	6 56	A38		B33	7 07	B28	7 07		
A38	7 21	A33	7 23	B5							
A5	7 35	B33	7 45	A10		B5	7 50	A38	7 56	B10	
A10	8 04	A5	8 06	A15		B10	8 18	B5	8 15	B15	
A15	8 32	A10	8 35	A20		B15	8 50	B10	8 46	B20	
A20	9 00	A15	9 00	A25		B20	9 14	B15	9 13	B25	
A25	9 28	A20	9 35	A30		B25	9 42	B20	9 40	B30	
A30	[illegible]	A25	[illegible]	A35		B30	10 11	B25	10 10	B35	
A35	10 07	A30	[illegible]	B2		B35	10 38	B30	10 38		
A2	10 37	A35	10 50	A7		B2	11 07	B35	11 04	B7	
A7	11 34	A2	11 30	A12		B7	11 35	B2	11 32	B12	
A12		A7		A17		B12		B7		B17	
A17		A12		A22		B17		B12		B22	
A22		A17		A27		B22		B17		B27	
A27		A22		A32		B27		B22		B32	
A32		A27		A37		B32		B27		B37	
A37		A32		B4		B37		B32			
A4		A37		A9		B4		B37		B9	
A9		A4		A14		B9		B4		B14	
A14		A9		A19		B14		B9		B19	
A19		A14		A24		B19		B14		B24	
A24		A19		A29		B24		B19		B29	
A29		A24		A34		B29	12 04	B24	12 23	B34	
A34	12 28	A29	12 34	B1		B34	12 50	B29	12 47		
	26		26				26		26		

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	[illegible]	[illegible]
1-2	6	6
2-3	5	5
3-4	4	4
4-5	3	3
5-6	6	6
6-7	5	5
7-8	4	[illegible]
8-9	4	4
9-10	5	5
10-11	4	4
11-12	3	3

TOTALS	P	C
12x8	—	—
8x4	18	18
4x12	31	34
Total	52	52

FOREMAN
12x8 -
8x4 -
4x12-

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

P U S H I N G S C H E D U L E

Wednesday, October 6, 1993 Turn 1
Battery: B

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	B23	18:08	11:50am	12:00am	12:10am
2	A33	18:07	12:04am	12:14am	12:24am
3	B33	18:07	12:18am	12:28am	12:38am
4	A38	18:07	12:32am	12:42am	12:52am
5	A5	18:07	12:46am	12:56am	1:06am
6	B5	18:07	1:00am	1:10am	1:20am
7	A10	18:07	1:14am	1:24am	1:34am
8	B10	18:07	1:28am	1:38am	1:48am
9	A15	18:07	1:42am	1:52am	2:02am
10	B15	18:07	1:57am	2:07am	2:17am
11	A20	18:06	2:11am	2:21am	2:31am
12	B20	18:05	2:25am	2:35am	2:45am
13	A25	18:04	2:39am	2:49am	2:59am
14	B25	18:03	2:53am	3:03am	3:13am
15	A30	18:02	3:07am	3:17am	3:27am
16	B30	18:01	3:21am	3:31am	3:41am
17	A35	18:00	3:35am	3:45am	3:55am
18	B35	18:00	3:50am	4:00am	4:10am
19	A2	17:59	4:04am	4:14am	4:24am
20	B2	17:58	4:18am	4:28am	4:38am
21	A7	17:57	4:32am	4:42am	4:52am
22	B7	17:56	4:46am	4:56am	5:06am
23	A12	17:55	5:00am	5:10am	5:20am
24	B12	17:54	5:14am	5:24am	5:34am
25	A17	17:53	5:28am	5:38am	5:48am
26	B17	17:52	5:42am	5:52am	6:02am
27	A22	17:52	5:57am	6:07am	6:17am
28	B22	17:51	6:11am	6:21am	6:31am
29	A27	17:50	6:25am	6:35am	6:45am
30	B27	17:49	6:39am	6:49am	6:59am
31	A32	17:48	6:53am	7:03am	7:13am
32	B32	17:47	7:07am	7:17am	7:27am
33	A37	17:46	7:21am	7:31am	7:41am
34	B37	17:45	7:35am	7:45am	7:55am

PUSHING SCHEDULE

Wednesday, October 6, 1993 Turn 2
Battery: B

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	A4	17:45	7:50am	8:00am	8:25am
2	B4	17:45	8:03am	8:15am	8:40am
3	A7	17:45	8:20am	8:30am	8:55am
4	B9	17:45	8:35am	8:45am	9:10am
5	A14	17:45	8:50am	9:00am	9:25am
6	B14	17:45	9:05am	9:15am	9:40am
7	A17	17:45	9:20am	9:30am	9:55am
8	B19	17:45	9:35am	9:45am	10:10am
9	A24	17:46	9:50am	10:00am	10:25am
10	B24	17:46	10:05am	10:15am	10:40am
11	A29	17:47	10:20am	10:30am	10:55am
12	B29	17:47	10:35am	10:45am	11:10am
13	A34	17:48	10:50am	11:00am	11:25am
14	B34	17:48	11:05am	11:15am	11:40am
15	A1	17:49	11:20am	11:30am	11:55am
16	B1	17:49	11:35am	11:45am	12:10pm
17	A6	17:50	11:50am	12:00pm	12:25pm
18	B6	17:50	12:05pm	12:15pm	12:40pm
19	A11	17:51	12:20pm	12:30pm	12:55pm
20	B11	17:51	12:35pm	12:45pm	1:10pm
21	A16	17:51	12:50pm	1:00pm	1:25pm
22	B16	17:52	1:05pm	1:15pm	1:40pm
23	A21	17:52	1:20pm	1:30pm	1:55pm
24	B21	17:53	1:35pm	1:45pm	2:10pm
25	A26	36:08	1:50pm	2:00pm	2:25pm
26	B26	18:08	2:05pm	2:15pm	2:40pm
27	A31	18:09	2:20pm	2:30pm	2:55pm
28	B31	18:09	2:35pm	2:45pm	3:10pm
29	A36	18:10	2:50pm	3:00pm	3:25pm
30	B36	18:10	3:05pm	3:15pm	3:40pm
31	A3	18:11	3:20pm	3:30pm	3:55pm
32	B3	18:11	3:35pm	3:45pm	4:10pm

P U S H I N G S C H E D U L E

Wednesday, October 6, 1993 Turn 3
Battery: B

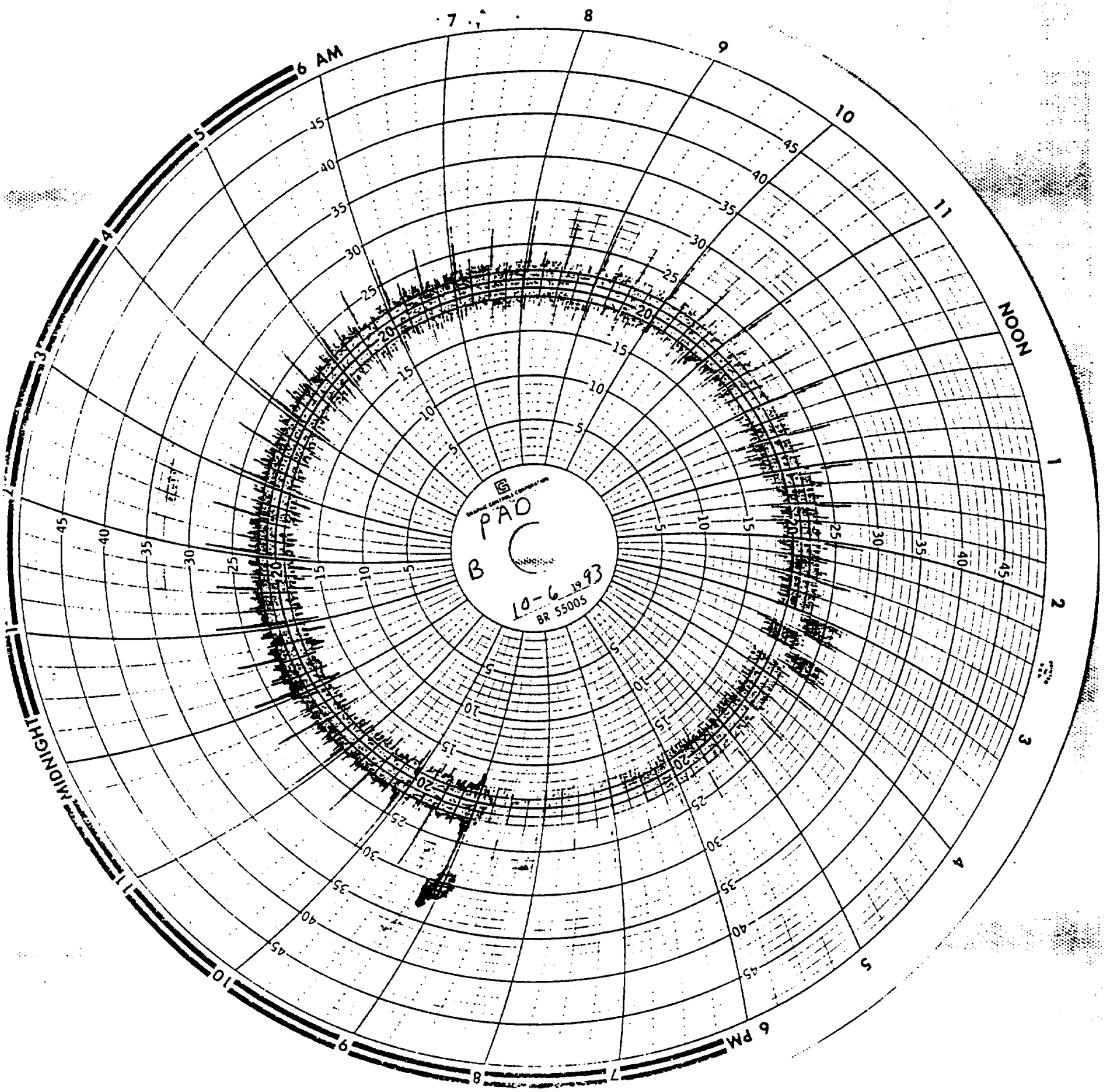
Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	B06	0:45	3:50pm	4:00pm	4:10pm
2	A2	0:44	4:04pm	4:14pm	4:24pm
3	B3	0:43	4:18pm	4:28pm	4:38pm
4	A6	18:53	4:32pm	4:42pm	4:52pm
5	B9	18:53	4:46pm	4:56pm	5:06pm
6	A12	18:52	5:00pm	5:10pm	5:20pm
7	B13	18:52	5:14pm	5:24pm	5:34pm
8	A16	18:51	5:28pm	5:38pm	5:48pm
9	B16	18:51	5:42pm	5:52pm	6:02pm
10	A20	18:51	5:57pm	6:07pm	6:17pm
11	B20	18:51	6:11pm	6:21pm	6:31pm
12	A23	18:50	6:25pm	6:35pm	6:45pm
13	B23	18:49	6:39pm	6:49pm	6:59pm
14	A27	18:49	6:53pm	7:03pm	7:13pm
15	B27	18:49	7:07pm	7:17pm	7:27pm
16	A30	18:49	7:21pm	7:31pm	7:41pm
17	A5	18:49	7:35pm	7:45pm	7:55pm
18	B5	18:50	7:50pm	8:00pm	8:10pm
19	A10	18:50	8:04pm	8:14pm	8:24pm
20	B10	18:50	8:18pm	8:28pm	8:38pm
21	A15	18:50	8:32pm	8:42pm	8:52pm
22	B15	18:49	8:46pm	8:56pm	9:06pm
23	A20	18:49	9:00pm	9:10pm	9:20pm
24	B20	18:49	9:14pm	9:24pm	9:34pm
25	A25	18:49	9:28pm	9:38pm	9:48pm
26	B25	18:49	9:42pm	9:52pm	10:02pm
27	A30	18:50	9:57pm	10:07pm	10:17pm
28	B30	18:50	10:11pm	10:21pm	10:31pm
29	A35	18:50	10:25pm	10:35pm	10:45pm
30	B35	18:49	10:39pm	10:49pm	10:59pm
31	A2	18:49	10:53pm	11:03pm	11:13pm
32	B2	18:49	11:07pm	11:17pm	11:27pm
33	A7	18:49	11:21pm	11:31pm	11:41pm
34	B7	18:49	11:35pm	11:45pm	11:55pm

NOON
MIDNIGHT
6 PM
STACK HOUSE
10-6 1993
BR 55005

6 AM
NOON
6 PM
MIDNIGHT
STACK DRAFT
B
10-6 1993
BR 55005

12 NOON
1 P.M.
2 P.M.
3 P.M.
4 P.M.
5 P.M.
6 P.M.
7 P.M.
8 P.M.
10 P.M.
11 P.M.
12 NIGHT
1 A.M.
5 A.M.
6 A.M.
7 A.M.
11 A.M.
PRESS

NOON
MIDNIGHT
6 PM
Volume
10-6-73
BR 55121


6 AM
NOON
6 PM
MIDNIGHT
PAD
B C
10-6 1993
BR 55005

COMPLIANCE DEMONSTRATION
B BATTERY BAGHOUSE

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX D

GRAVIMETRIC RESULTS, EMISSIONS CALCULATIONS

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

ANALYTICAL REPORTING FORM

CLIENT USS Clairton Works
PLANT LOCATION Clairton, PA ; B-Battery PEC
PROJECT NUMBER 300195-01
UNIT TESTED B-Battery PEC

TEST DATE 11/17/92 & 11/18/92
DATE RECEIVED 11/17/92 & 11/18/92
DATE ANALYZED 11/18/92, 11/20/92, 11/23/92
ANALYTICAL METHOD

Test Number	Component	Cyclone Weight Units ( )	Filter Weight Units (grams)	Insoluble Portion of Front Half Units ( )	0.22μ Filter Insoluble Portion of Back Half Units (grams)	Soluble Portion of Back Half Units (grams)	Soluble Portion of Front Half Units (grams)	Chloroform/ Ethyl Ether Extract Units ( )
CLR-M1-1	Particulate		0.0010		0.0004	0.0076	0.0038	
CLR-M3-1	Particulate		0.0010		0.0006	0.0119	0.0045	
CLR-M4-1	Particulate		0.0061		0.0013	0.0087	0.0106	
CLR-M5-1	Particulate		0.0013		0.0006	0.0098	0.0031	
CLR-M6-1	Particulate		0.0001		0.0003	0.0103	0.0057	
CLR-M7-1	Particulate		0.0139		0.0008	0.0170	0.0053	
CLR-M9-1	Particulate		0.0009		0.0004	0.0104	0.0050	
CLR-M10-1	Particulate		0.0008		0.0014	0.0057	0.0060	
CLR-M11-1	Particulate		0.0005		0.0008	0.0067	0.0049	
CLR-M12-1	Particulate		0.0001		0.0012	0.0048	0.0027	
CLR-M13-1	Particulate		0.0003		0.0004	0.0096	0.0034	
CLR-M14-1	Particulate		0.0005		0.0015	0.0040	0.0033	
CLR-ACET-BLK (BLANK)	Particulate					0.0000	0.0000	

Extraction Method
Solvent

Analyst's Signature Patrick J. Stockton / JPS
Date 12-3-92

Comments

AQE 3/92

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

ANALYTICAL REPORTING FORM

CLIENT: USS Clairton Works
PLANT LOCATION: Clairton, PA
PROJECT NUMBER: 300195-01
UNIT TESTED: B-Battery Baghouse

TEST DATE: 8/24/93
DATE RECEIVED: 8/24/93
DATE ANALYZED: 8/25/93
ANALYTICAL METHOD:

Test Number	Component	Cyclone Weight Units ( )	Filter Weight Units (g)	Insoluble Portion of Front Half Units ( )	0.22μ Filter Insoluble Portion of Back Half Units (g)	Soluble Portion of Back Half Units (g)	Soluble Portion of Front Half Units (g)	Chloroform/ Ethyl Ether Extract Units ( )
CLR-M2-2	Particulate		0.0000		0.0016	0.0069	0.0518	
CLR-M4-2	Particulate		0.0004		0.0018	0.0033	0.0085	
CLR-M7-2	Particulate		0.0029		0.0022	0.0041	0.0033	
CLR-M8-2	Particulate		0.0008		0.0023	0.0071	0.0030	

Extraction Method
Solvent

Analyst's Signature: PJS / JPS
Date: 9/3/93

Comments

AQE 3/92

KEYSTONE ENVIRONMENTAL RESOURCES
AIR QUALITY ENGINEERING

ANALYTICAL REPORTING FORM

CLIENT: USS - Clairton Steel
PLANT LOCATION: Clairton Steel - Clairton, Pa
PROJECT NUMBER: 300260-01
UNIT TESTED: M2

TEST DATE: 10/6/93
DATE RECEIVED: 10/7/93
DATE ANALYZED: 10/10/93
ANALYTICAL METHOD:

Test Number	Filter ID Number	Component	Cyclone Weight Units ( )	Filter Weight Units (grams)	Soluble Portion of Front Half H2O Rinse Units (grams)	Soluble Portion of Front Half Acetone Rinse Units (grams)	Soluble Portion of Back Half H2O Rinse Units (grams)	Soluble Portion of Back Half Acetone Rinse Units (grams)	0.22μm Filter Insoluble Portion of Back Half H2O Rinse Units (grams)
CLR-M2-3	1087	Particulate		0.0004	0.0100	0.0007	0.0009	0.0020	0.0006

Analyst's Signature: [illegible]
Date: 10/15/93

Comments

USS Clairton Works
B-Battery Baghouse Compliance Demonstration
Calculation of Allowable Emission Rate

11-17-92 test times : 0905 → 1115
"A" side : 5 ovens pushed from 0917 → 1138
"B" side : 5 ovens pushed from 0911 → 1128
} 10 ovens pushed in 147 min

11-17-92 test times : 1405 → 1720
"A" side : 7 ovens pushed from 1409 → 1637
"B" side : 7 ovens pushed from 1427 → 1649
} 14 ovens pushed in 160 min

11-18-92 test times : 0855 → 1110
"A" side : 3 ovens pushed from 0910 → 1040
"B" side : 3 ovens pushed from 0925 → 1059
} 6 ovens pushed in 109 min

8-24-93 test times : 0937 → 1139
"A" side : 3 ovens pushed from 1040 → 1137
"B" side : 3 ovens pushed from 1007 → 1122
} 6 ovens pushed in 90 min

8-24-93 test times : 1225 → 1432
"A" side : 7 ovens pushed from 1209 → 1436
"B" side : 8 ovens pushed from 1158 → 1447
} 15 ovens pushed in 169 min

10-6-93 test times : 1120 → 1335
"A" side : 5 ovens pushed from 1132 → 1346
"B" side : 6 ovens pushed from 1119 → 1357
} 11 ovens pushed in 158 min

$$\text{Overall pushing rate} = \frac{(10+14+6+6+15+11)\text{ ovens pushed}}{(147+160+109+90+169+158)\text{ min}}\left[\frac{60\text{ min}}{1\text{ hr}}\right]$$

$$= 4.47 \text{ ovens/hr}$$

Allowable Emission rate = 0.04 lb/ton coke pushed (25.1 tons/push)
$= (0.04)(25.1)(4.47) = 4.49$ lb/hr

From testing, Actual Emission Rate $= (5.23 \text{ lb/hr})(12/14) = 4.48$ lb/hr

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-17-92
TEST SITE 3-Battery Baghouse - Module #1 TEST NUMBER CLR-M1-1

A.	Barometric Pressure	29.24	in. Hg	
B.	Static Pressure	0.25	in. H2O	
C.	Stack Pressure	29.26	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.75	in. H2O	
E.	Meter Pressure	29.37	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.8	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9721		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.214	in.	
L.	Nozzle Area	2.50×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	92	°F	
N.	Average Stack Temperature	552	°R	(460+M)
O.	Average Meter Temperature	66	°F	
P.	Average Meter Temperature	526	°R	(460+O)
Q.	Condensate Volume	-5.2	mL	
R.	Absorbed H2O	18.8	mL	
S.	Total H2O	13.6	mL	(Q+R)
T.	Filter Weight	0.0010	g	
U.	Probe Weight	0.0038	g	
V.	Impinger Weight	0.0004	g	
W.	Total Weight	0.0052	g	(T+U+V)
X.	Metered Gas Volume	92.568	dcf	
Y.	Corrected Metered Gas Volume	89.985	dcf	(X*H)
Z.	H2O Gas Volume	0.653	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	90.638	cf	(Y+Z)
BB.	Percent H2O	0.7	%	(100*Z/AA)
CC.	Gas Volume Sampled	88.667	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0009	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.007		18	0.126
CO2	Ø	0.993	44	Ø
CO	Ø	↓	28	Ø
O2	0.205	↓	32	6.514
N2	0.795	↓	28	22.104

Average Molecular Weight 28.74 lb./lb. mol

FF.	Average Stack Velocity	52.0	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	39200	acfm	(60*FF*J)
HH	Standard Flow Rate	36700	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	101.9	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.28	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-24-93

TEST SITE B-Battery Baghouse - Module 2 TEST NUMBER CL2-M2-2

A.	Barometric Pressure	29.40	in. Hg	
B.	Static Pressure	+0.4	in. H2O	
C.	Stack Pressure	29.43	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.07	in. H2O	
E.	Meter Pressure	29.48	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.40	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9812		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.217	in.	
L.	Nozzle Area	2.57×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	122	°F	
N.	Average Stack Temperature	582	°R	(460+M)
O.	Average Meter Temperature	109	°F	
P.	Average Meter Temperature	569	°R	(460+O)
Q.	Condensate Volume	19.3	mL	
R.	Absorbed H2O	12.9	mL	
S.	Total H2O	32.2	mL	(Q+R)
T.	Filter Weight	0.0000	g	
U.	Probe Weight	0.0518	g	
V.	Impinger Weight	0.0016	g	
W.	Total Weight	0.0534	g	(T+U+V)
X.	Metered Gas Volume	66.850	dcf	
Y.	Corrected Metered Gas Volume	65.593	dcf	(X*H)
Z.	H2O Gas Volume	1.664	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	67.257	cf	(Y+Z)
BB.	Percent H2O	2.5	%	(100*Z/AA)
CC.	Gas Volume Sampled	59.972	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0137	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.025		18	0.45
CO2	Ø	0.975	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.40
N2	0.795		28	21.70

Average Molecular Weight 28.55 lb./lb. mol

FF.	Average Stack Velocity	37.8	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	28500	acfm	(60*FF*J)
HH	Standard Flow Rate	25400	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	98.5	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	2.91	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 10-6-93
TEST SITE B-Battery Baghouse - Module 2 TEST NUMBER CLR-M2-3

A.	Barometric Pressure	29.84	in. Hg	
B.	Static Pressure	0.15	in. H2O	
C.	Stack Pressure	29.85	in. Hg	[A+(B/13.6)]
D.	Average ΔH	0.83	in. H2O	
E.	Meter Pressure	29.90	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.35	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0151		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.225	in.	
L.	Nozzle Area	2.76×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	108	°F	
N.	Average Stack Temperature	568	°R	(460+M)
O.	Average Meter Temperature	93	°F	
P.	Average Meter Temperature	553	°R	(460+O)
Q.	Condensate Volume	4.3	mL	
R.	Absorbed H2O	9.8	mL	
S.	Total H2O	14.1	mL	(Q+R)
T.	Filter Weight	0.0004	g	
U.	Probe Weight	0.0107	g	
V.	Impinger Weight	0.0006	g	
W.	Total Weight	0.0117	g	(T+U+V)
X.	Metered Gas Volume	66.496	dcf	
Y.	Corrected Metered Gas Volume	62.425	dcf	(X*H)
Z.	H2O Gas Volume	0.698	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	63.123	cf	(Y+Z)
BB.	Percent H2O	1.1	%	(100*Z/AA)
CC.	Gas Volume Sampled	59.563	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0030	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.011		18	0.198
CO2	Ø	0.989	44	Ø
CO	Ø	↓	28	Ø
O2	0.205	↓	32	6.488
N2	0.795	↓	28	22.015

Average Molecular Weight 28.70 lb./lb. mol

FF.	Average Stack Velocity	34.6	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	26100	acfm	(60*FF*J)
HH	Standard Flow Rate	24200	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	94.5	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.62	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-17-92
TEST SITE B-Battery Baghouse - Module 3 TEST NUMBER CLR - M3 - 1

A.	Barometric Pressure	29.24	in. Hg	
B.	Static Pressure	0.20	in. H2O	
C.	Stack Pressure	29.25	in. Hg	[A+(B/13.6)]
D.	Average Δ H	0.49	in. H2O	
E.	Meter Pressure	29.28	in. Hg	[A+(D/13.6)]
F.	Average Δ P	0.21	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9617		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.214	in.	
L.	Nozzle Area	2.50×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	93	°F	
N.	Average Stack Temperature	553	°R	(460+M)
O.	Average Meter Temperature	69	°F	
P.	Average Meter Temperature	529	°R	(460+O)
Q.	Condensate Volume	-1.1	mL	
R.	Absorbed H2O	8.4	mL	
S.	Total H2O	7.3	mL	(Q+R)
T.	Filter Weight	0.0010	g	
U.	Probe Weight	0.0045	g	
V.	Impinger Weight	0.0006	g	
W.	Total Weight	0.0061	g	(T+U+V)
X.	Metered Gas Volume	52.035	dcf	
Y.	Corrected Metered Gas Volume	50.042	dcf	(X*H)
Z.	H2O Gas Volume	0.353	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	50.395	cf	(Y+Z)
BB.	Percent H2O	0.7	%	(100*Z/AA)
CC.	Gas Volume Sampled	48.879	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0019	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.007		18	0.126
CO2	Ø	0.993	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.514
N2	0.795		28	22.104

Average Molecular Weight 28.74 lb./lb. mol

FF.	Average Stack Velocity	26.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	20100	acfm	(60*FF*J)
HH	Standard Flow Rate	18800	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	109.8	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.30	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-17-92
TEST SITE B-Battery Baghouse - Module 4 TEST NUMBER CLR - M4 - 1

A.	Barometric Pressure	29.24	in. Hg	
B.	Static Pressure	0.30	in. H2O	
C.	Stack Pressure	29.26	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.63	in. H2O	
E.	Meter Pressure	29.36	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.80	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9721		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft²	(0.00545*I²)
K.	Nozzle Diameter	~~0.972~~ 0.214	in.	
L.	Nozzle Area	2.50×10^{-4}	ft²	(0.00545*K²)
M.	Average Stack Temperature	100	°F	
N.	Average Stack Temperature	560	°R	(460+M)
O.	Average Meter Temperature	68	°F	
P.	Average Meter Temperature	528	°R	(460+O)
Q.	Condensate Volume	1.5	mL	
R.	Absorbed H2O	17.5	mL	
S.	Total H2O	19.0	mL	(Q+R)
T.	Filter Weight	0.0061	g	
U.	Probe Weight	~~0.0013~~ 0.0106	g	
V.	Impinger Weight	0.0013	g	
W.	Total Weight	0.0180	g	(T+U+V)
X.	Metered Gas Volume	87.165	dcf	
Y.	Corrected Metered Gas Volume	84.733	dcf	(X*H)
Z.	H2O Gas Volume	0.916	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	85.649	cf	(Y+Z)
BB.	Percent H2O	1.1	%	(100*Z/AA)
CC.	Gas Volume Sampled	83.147	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0033	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.011		18	0.198
CO2	∅	0.989	44	∅
CO	∅		28	∅
O2	0.205		32	6.488
N2	0.795		28	22.015

Average Molecular Weight 28.70 lb./lb. mol

FF.	Average Stack Velocity	52.5	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	39600	acfm	(60*FF*J)
HH	Standard Flow Rate	36500	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	96.6	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	1.02	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-24-93
TEST SITE B-Battery Baghouse - Module 4 TEST NUMBER CLR - MM - 2

A.	Barometric Pressure	29.40	in. Hg	
B.	Static Pressure	0.2	in. H2O	
C.	Stack Pressure	29.41	in. Hg	[A+(B/13.6)]
D.	Average ΔH	0.80	in. H2O	
E.	Meter Pressure	29.46	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.50	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9619		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.195	in.	
L.	Nozzle Area	2.07×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	126	°F	
N.	Average Stack Temperature	586	°R	(460+M)
O.	Average Meter Temperature	119	°F	
P.	Average Meter Temperature	579	°R	(460+O)
Q.	Condensate Volume	20.5	mL	
R.	Absorbed H2O	10.1	mL	
S.	Total H2O	30.6	mL	(Q+R)
T.	Filter Weight	0.0004	g	
U.	Probe Weight	0.0085	g	
V.	Impinger Weight	0.0018	g	
W.	Total Weight	0.0107	g	(T+U+V)
X.	Metered Gas Volume	66.082	dcf	
Y.	Corrected Metered Gas Volume	63.564	dcf	(X*H)
Z.	H2O Gas Volume	1.609	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	65.173	cf	(Y+Z)
BB.	Percent H2O	2.5	%	(100*Z/AA)
CC.	Gas Volume Sampled	57.074	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0029	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.025		18	0.45
CO2	0	0.975	44	Ø
CO	0		28	Ø
O2	0.205		32	6.40
N2	0.795		28	21.70

Average Molecular Weight 28.55 lb./lb. mol

FF.	Average Stack Velocity	42.4	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	32000	acfm	(60*FF*J)
HH	Standard Flow Rate	28300	scfm	[CG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	104.5	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.69	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-17-92
TEST SITE B-Battery Baghouse - Module 5 TEST NUMBER CLR - M5 - 1

A.	Barometric Pressure	29.24	in. Hg	
B.	Static Pressure	0.60	in. H2O	
C.	Stack Pressure	29.28	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.43	in. H2O	
E.	Meter Pressure	29.35	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.55	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9617		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.214	in.	
L.	Nozzle Area	250×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	97	°F	
N.	Average Stack Temperature	557	°R	(460+M)
O.	Average Meter Temperature	77	°F	
P.	Average Meter Temperature	537	°R	(460+O)
Q.	Condensate Volume	2.0	mL	
R.	Absorbed H2O	14.0	mL	
S.	Total H2O	16.0	mL	(Q+R)
T.	Filter Weight	0.0013	g	
U.	Probe Weight	0.0031	g	
V.	Impinger Weight	0.0006	g	
W.	Total Weight	0.0050	g	(T+U+V)
X.	Metered Gas Volume	81.860	dcf	
Y.	Corrected Metered Gas Volume	78.725	dcf	(X*H)
Z.	H2O Gas Volume	0.785	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	79.510	cf	(Y+Z)
BB.	Percent H2O	1.0	%	(100*Z/AA)
CC.	Gas Volume Sampled	75.931	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0010	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.010		18	0.180
CO2	Ø	0.990	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.494
N2	0.795		28	22.037

Average Molecular Weight 28.71 lb./lb. mol

FF.	Average Stack Velocity	43.4	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	32700	acfm	(60*FF*J)
HH	Standard Flow Rate	30300	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	106.0	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.26	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-18-92
TEST SITE B-Battery Baghouse - Module 6 TEST NUMBER CLR-M6-1

A.	Barometric Pressure	29.44	in. Hg	
B.	Static Pressure	0.05	in. H2O	
C.	Stack Pressure	29.44	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.59	in. H2O	
E.	Meter Pressure	29.56	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.75	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9721		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.214	in.	
L.	Nozzle Area	250×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	102	°F	
N.	Average Stack Temperature	562	°R	(460+M)
O.	Average Meter Temperature	59	°F	
P.	Average Meter Temperature	519	°R	(460+O)
Q.	Condensate Volume	4.3	mL	
R.	Absorbed H2O	15.7	mL	
S.	Total H2O	20.0	mL	(Q+R)
T.	Filter Weight	0.0001	g	
U.	Probe Weight	0.0057	g	
V.	Impinger Weight	0.0003	g	
W.	Total Weight	0.0061	g	(T+U+V)
X.	Metered Gas Volume	85.557	dcf	
Y.	Corrected Metered Gas Volume	83.170	dcf	(X*H)
Z.	H2O Gas Volume	0.941	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	84.111	cf	(Y+Z)
BB.	Percent H2O	1.1	%	(100*Z/AA)
CC.	Gas Volume Sampled	83.594	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0011	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.011		18	0.198
CO2	Ø	0.989	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.488
N2	0.795		28	22.015

Average Molecular Weight 28.70 lb./lb. mol

FF.	Average Stack Velocity	50.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	38300	acfm	(60*FF*J)
HH	Standard Flow Rate	35400	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	100.1	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.33	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-18-93
TEST SITE B Battery Baghouse - Module 7 TEST NUMBER CLR-M7-1

A.	Barometric Pressure	29.44	in. Hg	
B.	Static Pressure	0.60	in. H2O	
C.	Stack Pressure	29.48	in. Hg	[A+(B/13.6)]
D.	Average ΔH	2.08	in. H2O	
E.	Meter Pressure	29.59	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.90	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9617		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.214	in.	
L.	Nozzle Area	2.50×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	99	°F	
N.	Average Stack Temperature	559	°R	(460+M)
O.	Average Meter Temperature	66	°F	
P.	Average Meter Temperature	526	°R	(460+O)
Q.	Condensate Volume	5.5	mL	
R.	Absorbed H2O	17.4	mL	
S.	Total H2O	22.9	mL	(Q+R)
T.	Filter Weight	0.0139	g	
U.	Probe Weight	0.0053	g	
V.	Impinger Weight	0.0008	g	
W.	Total Weight	0.0200	g	(T+U+V)
X.	Metered Gas Volume	97.719	dcf	
Y.	Corrected Metered Gas Volume	93.976	dcf	(X*H)
Z.	H2O Gas Volume	1.092	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	95.068	cf	(Y+Z)
BB.	Percent H2O	1.1	%	(100*Z/AA)
CC.	Gas Volume Sampled	93.293	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0033	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.011		18	0.198
CO2	Ø	0.989	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.488
N2	0.795		28	22.015

Average Molecular Weight 28.70 lb./lb. mol

FF.	Average Stack Velocity	53.4	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	41800	acfm	(60*FF*J)
HH	Standard Flow Rate	38900	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	101.7	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	1.09	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-24-93
TEST SITE B-Battery Baghouse - Module 7 TEST NUMBER CLR-M7-2

A.	Barometric Pressure	29.40	in. Hg	
B.	Static Pressure	0.2	in. H2O	
C.	Stack Pressure	29.41	in. Hg	[A+(B/13.6)]
D.	Average Δ H	0.70	in. H2O	
E.	Meter Pressure	29.45	in. Hg	[A+(D/13.6)]
F.	Average Δ P	0.50	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9619		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.195	in.	
L.	Nozzle Area	2.07×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	133	°F	
N.	Average Stack Temperature	593	°R	(460+M)
O.	Average Meter Temperature	124	°F	
P.	Average Meter Temperature	584	°R	(460+O)
Q.	Condensate Volume	23.0	mL	
R.	Absorbed H2O	10.4	mL	
S.	Total H2O	33.4	mL	(Q+R)
T.	Filter Weight	0.0029	g	
U.	Probe Weight	0.0033	g	
V.	Impinger Weight	0.0022	g	
W.	Total Weight	0.0084	g	(T+U+V)
X.	Metered Gas Volume	63.732	dcf	
Y.	Corrected Metered Gas Volume	61.304	dcf	(X*H)
Z.	H2O Gas Volume	1.771	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	63.075	cf	(Y+Z)
BB.	Percent H2O	2.8	%	(100*Z/AA)
CC.	Gas Volume Sampled	54.555	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0024	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.028		18	0.504
CO2	Ø	0.972	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.376
N2	0.795		28	21.637

Average Molecular Weight 28.52 lb./lb. mol

FF.	Average Stack Velocity	42.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	32200	acfm	(60*FF*J)
HH	Standard Flow Rate	28200	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	100.8	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.56	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-24-93
TEST SITE B-Battery Bechase-Module 8 TEST NUMBER CLR-M8-2

A.	Barometric Pressure	29.40	in. Hg	
B.	Static Pressure	0.40	in. H2O	
C.	Stack Pressure	29.43	in. Hg	[A+(B/13.6)]
D.	Average ΔH	0.70	in. H2O	
E.	Meter Pressure	29.45	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.95	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9812		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.181	in.	
L.	Nozzle Area	1.79×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	129	°F	
N.	Average Stack Temperature	589	°R	(460+M)
O.	Average Meter Temperature	112	°F	
P.	Average Meter Temperature	572	°R	(460+O)
Q.	Condensate Volume	22.0	mL	
R.	Absorbed H2O	9.6	mL	
S.	Total H2O	31.6	mL	(Q+R)
T.	Filter Weight	0.0008	g	
U.	Probe Weight	0.0030	g	
V.	Impinger Weight	0.0023	g	
W.	Total Weight	0.0061	g	(T+U+V)
X.	Metered Gas Volume	57.015	dcf	
Y.	Corrected Metered Gas Volume	55.943	dcf	(X*H)
Z.	H2O Gas Volume	1.642	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	57.585	cf	(Y+Z)
BB.	Percent H2O	2.9	%	(100*Z/AA)
CC.	Gas Volume Sampled	50.829	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0019	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.029		18	0.522
CO2	0	0.971	44	Ø
CO	0		28	Ø
O2	0.205		32	6.370
N2	0.795		28	21.614

Average Molecular Weight 28.51 lb./lb. mol

FF.	Average Stack Velocity	44.6	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	33700	acfm	(60*FF*J)
HH	Standard Flow Rate	29700	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	103.2	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.47	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-17-92
TEST SITE B-Battery Baghouse - Module 9 TEST NUMBER CLR-M9-1

A.	Barometric Pressure	29.24	in. Hg	
B.	Static Pressure	0.25	in. H2O	
C.	Stack Pressure	29.26	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.75	in. H2O	
E.	Meter Pressure	29.37	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.65	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9916		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.234	in.	
L.	Nozzle Area	2.99×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	93	°F	
N.	Average Stack Temperature	553	°R	(460+M)
O.	Average Meter Temperature	93	°F	
P.	Average Meter Temperature	553	°R	(460+O)
Q.	Condensate Volume	-2.3	mL	
R.	Absorbed H2O	16.7	mL	
S.	Total H2O	14.4	mL	(Q+R)
T.	Filter Weight	0.0009	g	
U.	Probe Weight	0.0050	g	
V.	Impinger Weight	0.0004	g	
W.	Total Weight	0.0063	g	(T+U+V)
X.	Metered Gas Volume	94.129	dcf	
Y.	Corrected Metered Gas Volume	93.338	dcf	(X*H)
Z.	H2O Gas Volume	0.727	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	94.065	cf	(Y+Z)
BB.	Percent H2O	0.8	%	(100*Z/AA)
CC.	Gas Volume Sampled	87.480	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0011	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.008		18	0.144
CO2	Ø	0.992	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.568
N2	0.795		28	22.082

Average Molecular Weight 28.73 lb./lb. mol

FF.	Average Stack Velocity	47.0	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	35400	acfm	(60*FF*J)
HH	Standard Flow Rate	33100	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	93.4	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.31	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-17-92

TEST SITE B-Battery Baghouse - Module 10 TEST NUMBER CCR-M10-1

A.	Barometric Pressure	29.34	in. Hg	
B.	Static Pressure	0.60	in. H2O	
C.	Stack Pressure	29.28	in. Hg	[A+(B/13.6)]
D.	Average Δ H	1.79	in. H2O	
E.	Meter Pressure	29.37	in. Hg	[A+(D/13.6)]
F.	Average Δ P	0.80	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0094		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.217	in.	
L.	Nozzle Area	2.57×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	90	°F	
N.	Average Stack Temperature	550	°R	(460+M)
O.	Average Meter Temperature	78	°F	
P.	Average Meter Temperature	538	°R	(460+O)
Q.	Condensate Volume	-3.7	mL	
R.	Absorbed H2O	17.7	mL	
S.	Total H2O	14.0	mL	(Q+R)
T.	Filter Weight	0.0008	g	
U.	Probe Weight	0.0060	g	
V.	Impinger Weight	0.0014	g	
W.	Total Weight	0.0082	g	(T+U+V)
X.	Metered Gas Volume	93.559	dcf	
Y.	Corrected Metered Gas Volume	94.438	dcf	(X*H)
Z.	H2O Gas Volume	0.688	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	95.126	cf	(Y+Z)
BB.	Percent H2O	0.7	%	(100*Z/AA)
CC.	Gas Volume Sampled	90.979	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0014	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.007		18	0.126
CO2	Ø	0.993	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.564
N2	0.795		28	22.104

Average Molecular Weight 28.79 lb./lb. mol

FF.	Average Stack Velocity	51.9	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	39200	acfm	(60*FF*J)
HH	Standard Flow Rate	36800	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	101.5	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.44	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-17-92
TEST SITE B-Battery Baghouse - Module 11 TEST NUMBER CLR - M11 - 1

A.	Barometric Pressure	29.24	in. Hg	
B.	Static Pressure	0.4	in. H2O	
C.	Stack Pressure	29.27	in. Hg	[A+(B/13.6)]
D.	Average ΔH	0.43	in. H2O	
E.	Meter Pressure	29.27	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.18	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0094		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.217	in.	
L.	Nozzle Area	2.57×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	90	°F	
N.	Average Stack Temperature	550	°R	(460+M)
O.	Average Meter Temperature	74	°F	
P.	Average Meter Temperature	534	°R	(460+O)
Q.	Condensate Volume	0.4	mL	
R.	Absorbed H2O	9.5	mL	
S.	Total H2O	9.9	mL	(Q+R)
T.	Filter Weight	0.0005	g	
U.	Probe Weight	0.0049	g	
V.	Impinger Weight	0.0008	g	
W.	Total Weight	0.0062	g	(T+U+V)
X.	Metered Gas Volume	46.705	dcf	
Y.	Corrected Metered Gas Volume	47.144	dcf	(X*H)
Z.	H2O Gas Volume	0.483	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	47.627	cf	(Y+Z)
BB.	Percent H2O	1.0	%	(100*Z/AA)
CC.	Gas Volume Sampled	45.602	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0021	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.010		18	0.180
CO2	Ø	0.990	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.494
N2	0.795		28	22.037

Average Molecular Weight 28.71 lb./lb. mol

FF.	Average Stack Velocity	24.6	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	18600	acfm	(60*FF*J)
HH	Standard Flow Rate	17500	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	107.5	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.31	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-17-92
TEST SITE B-Battery Baghouse - Module 12 TEST NUMBER CCR - M12 - 1

A.	Barometric Pressure	29.24	in. Hg	
B.	Static Pressure	0.05	in. H2O	
C.	Stack Pressure	29.24	in. Hg	[A+(B/13.6)]
D.	Average ΔH	0.38	in. H2O	
E.	Meter Pressure	29.27	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.14	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9918		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.234	in.	
L.	Nozzle Area	2.99×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	91	°F	
N.	Average Stack Temperature	551	°R	(460+M)
O.	Average Meter Temperature	86	°F	
P.	Average Meter Temperature	546	°R	(460+O)
Q.	Condensate Volume	1.2	mL	
R.	Absorbed H2O	8.5	mL	
S.	Total H2O	9.7	mL	(Q+R)
T.	Filter Weight	0.0001	g	
U.	Probe Weight	0.0027	g	
V.	Impinger Weight	0.0012	g	
W.	Total Weight	0.0040	g	(T+U+V)
X.	Metered Gas Volume	42.495	dcf	
Y.	Corrected Metered Gas Volume	42.138	dcf	(X*H)
Z.	H2O Gas Volume	0.484	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	42.622	cf	(Y+Z)
BB.	Percent H2O	1.1	%	(100*Z/AA)
CC.	Gas Volume Sampled	39.864	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.015	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.011		18	0.198
CO2	Ø	0.989	44	Ø
CO	Ø	↓	28	Ø
O2	0.205		32	6.488
N2	0.795		28	22.015

Average Molecular Weight 28.70 lb./lb. mol

FF.	Average Stack Velocity	21.8	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	16400	acfm	(60*FF*J)
HH	Standard Flow Rate	15400	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	91.8	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.20	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 11-18-92
TEST SITE B-Battery Baghouse - Module 13 TEST NUMBER CLR-M13-1

A.	Barometric Pressure	29.44	in. Hg	
B.	Static Pressure	0.50	in. H2O	
C.	Stack Pressure	29.48	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.20	in. H2O	
E.	Meter Pressure	29.53	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.45	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9918		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.234	in.	
L.	Nozzle Area	2.99×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	94	°F	
N.	Average Stack Temperature	554	°R	(460+M)
O.	Average Meter Temperature	90	°F	
P.	Average Meter Temperature	550	°R	(460+O)
Q.	Condensate Volume	4.0	mL	
R.	Absorbed H2O	14.6	mL	
S.	Total H2O	18.6	mL	(Q+R)
T.	Filter Weight	0.0003	g	
U.	Probe Weight	0.0034	g	
V.	Impinger Weight	0.0004	g	
W.	Total Weight	0.0041	g	(T+U+V)
X.	Metered Gas Volume	78.035	dcf	
Y.	Corrected Metered Gas Volume	77.380	dcf	(X*H)
Z.	H2O Gas Volume	0.928	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	78.308	cf	(Y+Z)
BB.	Percent H2O	1.2	%	(100*Z/AA)
CC.	Gas Volume Sampled	73.317	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0009	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.012		18	0.216
CO2	Ø	0.988	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.481
N2	0.795		28	21.993

Average Molecular Weight 28.69 lb./lb. mol

FF.	Average Stack Velocity	39.0	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	29400	acfm	(60*FF*J)
HH	Standard Flow Rate	27600	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	720	sec	
JJ.	Percent Isokinetic	94.2	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.21	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 1-18-93
TEST SITE B-Battery Baghouse - Module 14 TEST NUMBER CLR-1M14-1

A.	Barometric Pressure	29.44	in. Hg	
B.	Static Pressure	0.6	in. H2O	
C.	Stack Pressure	29.48	in. Hg	[A+(B/13.6)]
D.	Average Δ H	0.50	in. H2O	
E.	Meter Pressure	29.48	in. Hg	[A+(D/13.6)]
F.	Average Δ P	0.21	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0094		
I.	Stack Diameter	48	in.	
J.	Stack Area	12.57	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.217	in.	
L.	Nozzle Area	2.57×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	97	°F	
N.	Average Stack Temperature	557	°R	(460+M)
O.	Average Meter Temperature	70	°F	
P.	Average Meter Temperature	530	°R	(460+O)
Q.	Condensate Volume	2.1	mL	
R.	Absorbed H2O	9.8	mL	
S.	Total H2O	11.9	mL	(Q+R)
T.	Filter Weight	0.0005	g	
U.	Probe Weight	0.0033	g	
V.	Impinger Weight	0.0015	g	
W.	Total Weight	0.0053	g	(T+U+V)
X.	Metered Gas Volume	50.814	dcf	
Y.	Corrected Metered Gas Volume	51.292	dcf	(X*H)
Z.	H2O Gas Volume	0.572	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	51.864	cf	(Y+Z)
BB.	Percent H2O	1.1	%	(100*Z/AA)
CC.	Gas Volume Sampled	50.347	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0016	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.011		18	0.198
CO2	Ø	0.989	44	Ø
CO	Ø		28	Ø
O2	0.205		32	6.488
N2	0.795		28	22.015

Average Molecular Weight 28.70 lb./lb. mol

FF.	Average Stack Velocity	26.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	20100	acfm	(60*FF*J)
HH	Standard Flow Rate	18800	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	110.3	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	0.25	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL