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.

~~3~~

Recd 7/2/82

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
JOHN FITCH PLAZA, CN027, TRENTON, N.J. 08625

June 23, 1982

GRAY
IRON FOUNDRIES 12.10
AP-42 Section ~~7.10~~
Reference Number
20

Mr. Michael Jasinski
Environmental Engineer
GCA Corporation
Technology Division
213 Burlington Road
Bedford, Massachusetts 01730

Dear Mr. Jasinski:

Enclosed is a copy of the latest stack tests conducted at Atlantic States Cast Iron. Additional information is considered confidential and would require approval from the Company before it could be released. If you have any further questions, please contact me.

Very truly yours,

Lou Mikolajczyk
Supervisor
Technical Services Section
Bureau of Air Pollution
Control Operations

LM:eac

Enclosure

GCA

GCA CORPORATION
Technology Division

213 Burlington Road
Bedford, Massachusetts 01730
Telephone: 617-275-5444
Telex: 92-3339

4 June 1982

Mr. Lou Mikolojczyk
New Jersey Division of
Environmental Quality
Technical Services Section
625 Prospect Street
Trenton, NJ 08618

Dear Mr. Mikolojczyk:

Pursuant to our phone conversation on the above date, this letter is written to formalize a request for the stack test report regarding the Atlantic States Cast Iron Foundry.

GCA is currently involved in an EPA funded project (Contract No. 68-02-3157, Task No. 017) with the intent of revising and updating the AP-42 emission factors for the Grey Iron Foundry Industry. To accomplish this task, reports such as the one discussed are necessary to obtain current documented emissions data. As the grey iron foundry industry is not an area of significant research efforts for emissions evaluation, the majority of testing is performed as required to meet regulatory and/or permitting requirements. Therefore, the cooperation of state air pollution control agencies is providing test reports and pertinent information, i.e. process data in order to develop an emission factor (lb of particulate/ton of metal charged), during those tests is of considerable importance for the successful completion of this task.

If there are any further questions regarding this project or the type of information we are requesting, please feel free to call me at (617) 275-5444, ext. 4209. Thank you for your time and effort in this matter.

Sincerely,

Michael Jasinski

Michael Jasinski
Environmental Engineer

MJ/cf

TEST REPORT

STACK ANALYSIS

FOR

PARTICULATE EMISSION

Foundry/Scrubber

Client: Atlantic States Cast Iron
183 Sitgreaves Street
Phillipsburg, New Jersey

Testing Firm: Mease Engineering Associates
P.O. Box 51
Port Matilda, Pennsylvania

RESULTS SUMMARY

CLIENT:	Atlantic States Cast Iron Pipe Company 183 Sitgreaves Street Phillipsburg, New Jersey 08865
TEST LOCATION:	Atlantic States Cast Iron Pipe Company 183 Sitgreaves Street Phillipsburg, New Jersey 08865
UNIT TESTED:	Foundry/Venturi Scrubber
TEST PURPOSE:	Determine the compliance nature of the process with applicable State of New Jersey particulate air pollution emission requirements.
TEST EQUIPMENT:	Research Appliance Company "STAKSAMPLR" Portable Gas Sampler, Model #2343.
TEST METHOD:	Environmental Protection Agency Method 5-Determination of Particulate Emissions from Stationary Sources, as described in the Federal Register, Vol. 42, no. 160, August 18, 1977.
TESTS PERFORMED:	1. Air Volumes and Temperatures 2. Particulate Emission Rate

TEST ENGINEER:

Michael J. Mease

Michael J. Mease
N.J. P.E. No. 24320

SUMMARY TEST DATA

Process: Foundry Cupola #2/Scrubber

	Run #1	Run #2	Run #3
Test Date and Times	9/29/80 8:08-9:41 am	9/29/80 10:33-11:52am	9/29/80 12:21-1:40 pm
Stack Diameter, Inches	59.375	59.375	59.375
Sampling Nozzle Diameter, In.	0.251	0.251	0.251
Testing Time, Minutes	72	72	72
Stack Gas Temperature, °F	193	191	188
Stack Gas Moisture Content, %	38.3	39.1	39.9
Stack Gas Volume Sampled, $Ft.^3$	31.046	30.708	31.665
Stack Gas Volume Sampled, SCF @ 70°F, dry, 29.92in.Hg.	31.0	31.2	31.8
Stack Gas Velocity, Ft./Sec.	41.2	40.7	40.9
Stack Gas Flowrate, ACFM	47,500	46,900	47,200
Stack Gas Flowrate, SCFM @70°F, dry, 29.92 in.Hg.	24,200	23,600	23,500
Particulate Captured, Grams	0.1380	0.1335	0.1375
Particulate Concentration, Grains/SCF	0.069	0.066	0.067
Pollutant Mass Rate, Lb./Hr.	14.2	13.4	13.5
Percent Isokinetic of Test	99.8	103	105

Approx production rate = 39 tons/hr
(raw materials charged)

TEST PROCEDURE SUMMARY

The test procedure employed was the Environmental Protection Agency Method 5 and the State of New Jersey Method 1 for particulate emissions. The tests were performed on a 59.375 inch diameter stack. Two separate traverses of twelve points each were sampled for a total of twenty-four sampling points. Each point was sampled for a period of three minutes for a total test time of seventy-two minutes. Three separate tests were conducted. The tests were observed by Mr. Leonard S. Sobolewski of the New Jersey State Department of Environmental Protection.

CUPOLA PROCESS DESCRIPTION

Two cupolas are located side by side and operate one at a time on alternate days. During the test period, cupola #2 was operating. The cupola is charged with scrap steel, iron, and coke via a charging bucket hoisted by a jib crane. As charges are dropped into the cupola, a hot blast system supplies oxygen enriched hot air through tuyeres into the melting zone. The exhaust gas is pulled through a primary cooler located between each cupola. An isolation valve separates the idle cupola from the system. After leaving the primary cooler, the gas is pulled through a venturi scrubber, into a cyclone mist eliminator, through the centrifugal fan and up the stack. See diagram next page.

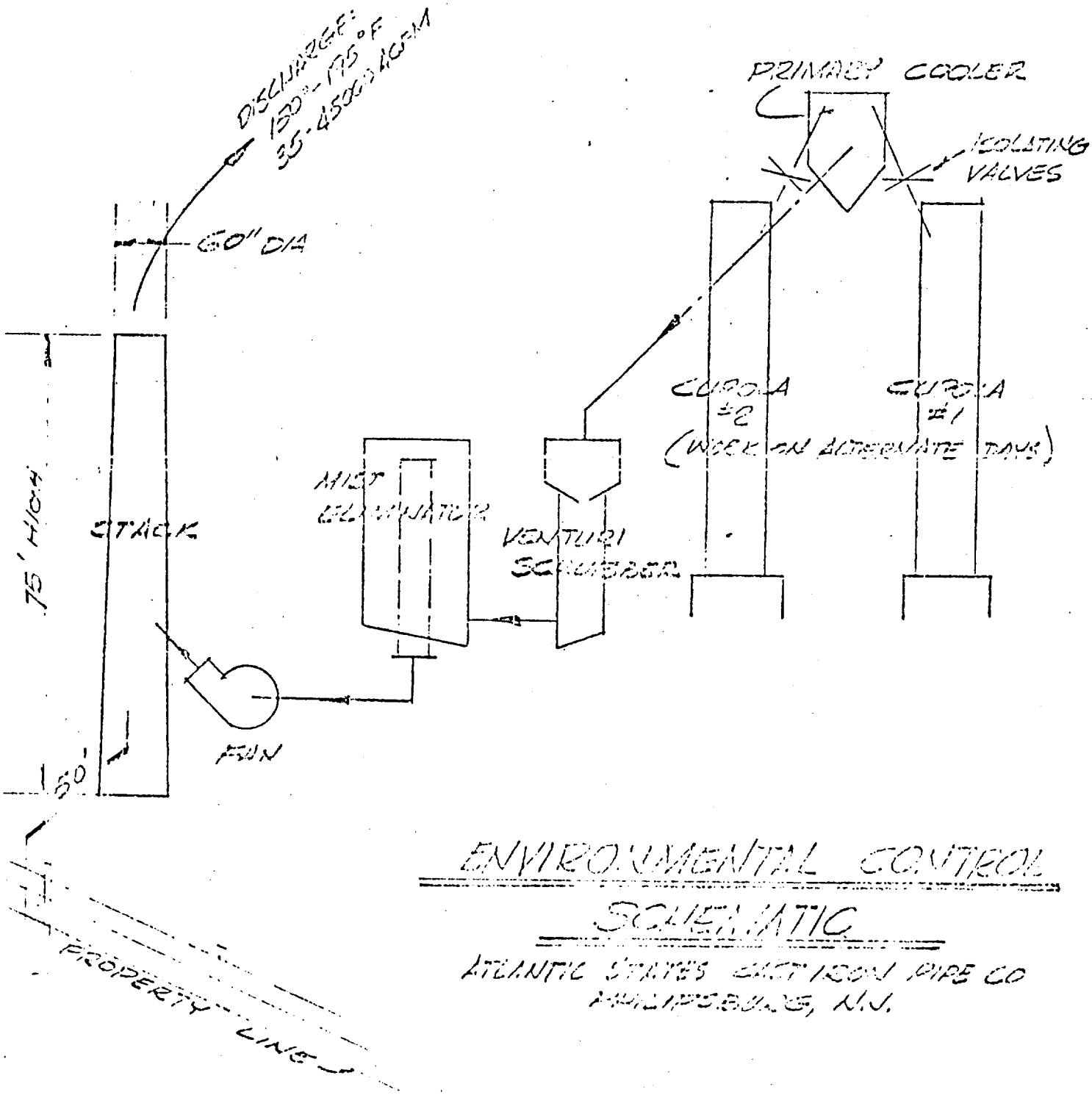
DESCRIPTION OF PARTICULATE

The particulate captured in the probe, cyclone eliminator, front half of the filter compartment, and the filter is grayish in color. The total particulate catch is the sum of the particulate caught in the probe, cyclone eliminator, front half of the filter compartment, and the filter. The particulate caught in the impingers is not included.

The emission rates for the three tests were determined to be 14.2, 13.4, and 13.5 pounds per hour, respectively.

SAMPLING POINT LOCATIONS

The sampling points were located at the following distances, in inches, from the stack wall: 1.25, 3.98, 7.01, 10.51, 14.84, 21.08, 38.30, 44.53, 48.87, 52.37, 55.40, and 58.13 inches.



ENVIRONMENTAL CONTROL
SCHEMATIC
ATLANTIC STATES CAST IRON PIPE CO
PHILLIPSBURG, N.J.

LAB & FIELD DATA

Mease Engineering Associates

Environmental Consultants

LABORATORY WORKSHEET

Client: ATLANTIC STATES

Run No. & Date: 9/23/80

Process: CUPOLA/SCRUBBER

Sample Box No.: 1

Filter Analysis:

Filter Wt., grams 0.7275

Filter Tare, gms 0.6125

Part. Increase, gm. 0.1241

Impinger Water Increase:

Silica Gel Impinger (#4):

Final Wt., gms 272.3

Tare Wt., gms 261.7

H_2O Increase 10.6

Total Water Volume Increase:

Impinger #1 331 ml

Impinger #2 64 ml

Impinger #3 3 ml

Impinger #4 10.6 ml

TOTAL INCREASE 408.6 ml

Impinger Analysis:

Wash Bottle No. _____

Filter Wt., gms _____

Filter Tare, gms _____

Total Insoluble _____

Final Beaker Wt. _____

Tare Wt. (No. ___) _____

Total Soluble _____

Probe Wash Analysis:

Wash Volume, ml. 260

Acetone Density, mg/ml _____

Blank Volume, ml 50

Blank Residue

Final Wt. 102.2238

Tare Wt. 102.2237

Part. Wt. 0.0001

Wash Analysis, Bottle No. _____

Beaker Wt., gms [illegible]

Tare Wt. (No. 2) [illegible]

Part. Wt., gms [illegible]

Particulate Weight Summary:

Filter 0.1241

Probe Wash [illegible]

Impingers (Sol.) _____

Impingers (Insol.) _____

Total (w/imp.) _____ grams

Total (w/o imp.) 0.1280 grams

Signature: Michael J Mease

Date: 10/1/80

Mease Engineering Associates

Environmental Consultants

LABORATORY WORKSHEET

Client: ATLANTIC STATES

Run No. & Date: 2 9/29/80

Process: CUPOLA / SCRUBBER

Sample Box No.: 2

Filter Analysis:

- Filter Wt., grams 0.7303
- Filter Tare, gms 0.6120
- Part. Increase, gm. [illegible]

Impinger Water Increase:

Silica Gel Impinger (#4):

- Final Wt., gms [illegible]
- Tare Wt., gms 321.3
- H_2O Increase 11.6

Total Water Volume Increase:

- Impinger #1 37[illegible] ml
- Impinger #2 40 ml
- Impinger #3 < ml
- Impinger #4 11.6 ml
- TOTAL INCREASE 425.6 ml

Impinger Analysis:

- Wash Bottle No. _____
- Filter Wt., gms _____
- Filter Tare, gms _____
- Total Insoluble _____
- Final Beaker Wt. _____
- Tare Wt. (No.___) _____
- Total Soluble _____

Particulate Weight Summary:

- Filter 0.[illegible]
- Probe Wash [illegible]
- Impingers (Sol.) _____
- Impingers (Insol.) _____
- Total (w/imp.) _____ grams
- Total (w/o imp.) 0.[illegible] grams

Probe Wash Analysis:

- Wash Volume, ml. 235
- Acetone Density, mg/ml _____
- Blank Volume, ml _____
- Blank Residue
  - Final Wt. _____
  - Tare Wt. _____
  - Part. Wt. _____
- Wash Analysis, Bottle No.
  - Beaker Wt., gms [illegible]
  - Tare Wt. (No. 18) [illegible]
  - Part. Wt., gms 0.[illegible]

Signature: Michael J. Mease

Date: 10/1/80

Mease Engineering Associates

Environmental Consultants

LABORATORY WORKSHEET

Client: ATLANTIC STATES

Process: CUPOLA / SCRUBBER

Run No. & Date: 3 9/9/80

Sample Box No.: 3

Filter Analysis:

Filter Wt., grams [illegible]

Filter Tare, gms 0.6117

Part. Increase, gm. 0.1216

Impinger Water Increase:

Silica Gel Impinger (#4):

Final Wt., gms 295.7

Tare Wt., gms 279.5

H_2O Increase 16.2

Total Water Volume Increase:

Impinger #1 290 ml

Impinger #2 130 ml

Impinger #3 [illegible] ml

Impinger #4 16.2 ml

TOTAL INCREASE 448.2 ml

Impinger Analysis:

Wash Bottle No. _____

Filter Wt., gms _____

Filter Tare, gms _____

Total Insoluble _____

Final Beaker Wt. _____

Tare Wt. (No. ___) _____

Total Soluble _____

Probe Wash Analysis:

Wash Volume, ml. 220

Acetone Density, mg/ml _____

Blank Volume, ml _____

Blank Residue

Final Wt. _____

Tare Wt. _____

Part. Wt. _____

Wash Analysis, Bottle No. _____

Beaker Wt., gms [illegible]

Tare Wt. (No. 5) [illegible]

Part. Wt., gms [illegible]

Particulate Weight Summary:

Filter 0.1216

Probe Wash [illegible]

Impingers (Sol.) _____

Impingers (Insol.) _____

Total (w/imp.) _____ grams

Total (w/o imp.) [illegible] grams

Signature: Michael J Mease

Date: 10/1/80

MEASE ENGINEERING ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PARTICULATE FIELD DATA

%CO_2	%O_2	%N_2
12.5	4.5	
11.5	4.5	
12.4	4.3	
12.133	4.433	83.434

1.93

RUN No. 1
LOCATION ATLANTIC STATES
DATE 9/29/80
OPERATOR MEASE/WADZINSKI
SAMPLE BOX No. 1

TIME, START 8:09 am
TIME, FINISH 9:41
WASH BOTTLE No. 111
STACK DIMEN. 59.375" Ø
SAMPLE BOX TEMP. °F 235
STACK PRESS., in. H_2O -0.20

AMBIENT TEMP. °F 55
BAR. PRESS. "Hg. 30.372
ASSUMED MOISTURE % 37-39%
HEATER BOX SETTING, °F 230-240
PROBE TIP DIA., 0.251" No.
PROBE LENGTH 6' glass No.
PROBE HEATER SETTING 80

INITIAL DRY GAS METER READING 64.252

POINT	CLOCK TIME	DRY GAS METER, CF	PITOT In. H_2O ΔP	ORIFICE ΔH In. H_2O DESIRED	ORIFICE ΔH In. H_2O ACTUAL	DRY GAS TEMP. °F INLET	DRY GAS TEMP. °F OUTLET	PUMP VACUUM In. Hg. GAUGE	IMPINGER TEMP. °F	STACK TEMP. °F
1	3	65.294	0.26	0.41	0.41	62	61	9.0	60	190
2	3	66.532	0.38	0.61	0.61	65	63	10.0	62	193
3	3	67.818	0.29	0.62	0.62	69	63	10.0	62	194
4	3	69.091	0.38	0.61	0.61	72	64	11.0	56	194
5	3	70.351	0.38	0.61	0.61	75	65	11.0	56	194
6	3	71.630	0.38	0.61	0.61	78	66	12.0	56	195
7	3	73.004	0.46	0.74	0.74	81	67	12.0	56	195
8	3	74.388	0.44	0.72	0.72	84	69	12.0	56	195
9	3	75.772	0.44	0.71	0.71	84	70	12.0	56	194
10	3	77.081	0.39	0.63	0.63	86	72	12.0	56	194
11	3	78.325	0.36	0.59	0.59	86	73	12.0	62	192
12	3	79.526	0.22	0.36	0.36	85	74	10.0	62	[illegible]
		79.434								
13	3	80.653	0.34	0.55	0.55	72	71	10.0	60	192
14	3	81.876	0.35	0.56	0.56	73	72	10.0	60	194
15	3	83.160	0.39	0.63	0.63	76	72	11.0	60	195
16	3	84.520	0.44	0.71	0.71	78	73	11.0	60	195
17	3	85.966	0.46	0.74	0.74	81	74	11.0	60	194
18	3	87.436	0.49	0.80	0.80	83	75	12.0	62	194
19	3	88.862	0.46	0.75	0.75	84	75	12.0	62	195
20	3	90.296	0.47	0.77	0.77	85	76	12.0	62	195
21	3	91.745	0.47	0.77	0.77	84	76	12.0	62	197
22	3	93.146	0.44	0.72	0.72	82	76	11.0	60	195
23	3	94.152	0.27	0.30	0.30	79	76	9.0	60	185
24	3	[illegible]	0.38	0.63	0.63	77	75	9.0	60	180
						TOTAL AVG.				AVG. [illegible]

% CO_2	% O_2	% N_2
12.9	5.0	
12.9	4.4	
13.2	4.9	
13.0	4.77	82.23

1.22
9:40

MEASE ENGINEERING ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PARTICULATE FIELD DATA

RUN No. 2
LOCATION ATLANTIC STATES
DATE 9/29/80
OPERATOR MEASE / VADEINSEL
SAMPLE BOX No. 2

TIME, START 10:33 am
TIME, FINISH 11:52 am
WASH BOTTLE No. 2/2
STACK DIMEN. 59.375" Ø
SAMPLE BOX TEMP. °F 225
STACK PRESS., in. H_2O −0.20

AMBIENT TEMP. °F 60
BAR. PRESS. "Hg. 30.372
ASSUMED MOISTURE % 37
HEATER BOX SETTING, °F 225
PROBE TIP DIA., .251" No.
PROBE LENGTH 5 feet No.
PROBE HEATER SETTING 85

INITIAL DRY GAS METER READING 95.717

POINT	CLOCK TIME	DRY GAS METER, CF	PITOT In. H_2O ΔP	ORIFICE ΔP In. H_2O DESIRED	ORIFICE ΔP In. H_2O ACTUAL	DRY GAS TEMP. °F INLET	DRY GAS TEMP. °F OUTLET	PUMP VACUUM In. Hg. GAUGE	IMPINGER TEMP. °F	STACK TEMP. °F
1	3	96.732	0.35	0.40	0.45	62	63	10.0	56	180
2	3	97.[illegible]	0.35	0.55	0.55	62	63	[illegible]	56	[illegible]
3	3	[illegible]	0.37	0.59	0.59	66	64	10.5	56	195
4	3	100.321	0.37	0.59	0.59	68	65	10.5	60	[illegible]
5	3	101.636	0.37	0.59	0.59	68	65	10.5	60	195
6	3	103.222	0.38	0.60	0.60	72	66	12.0	60	193
7	3	104.282	0.46	0.73	0.73	75	68	12.0	60	[illegible]
8	3	105.522	0.41	0.66	0.66	74	69	12.0	61	195
9	3	[illegible]	0.36	0.58	0.58	80	70	11.0	0	194
10	3	[illegible]	0.35	0.57	0.57	79	71	11.5	61	195
11	3	109.301	0.36	0.58	0.58	79	72	0.0	0	192
12	3	110.370	0.24	0.40	0.40	80	73			
	40	[illegible]								
13	3	111.506	0.34	0.55	0.55	70	70	11.0	60	195
14	3	112.[illegible]	0.37	0.60	0.60	71	71	11.0	[illegible]	190
15	3	[illegible]	0.38	0.61	0.61	72	71	[illegible]	58	195
16	3	[illegible]	0.39	0.62	0.62	73	71	11.5	60	197
17	3	115.420	0.42	0.68	0.68	74	72	12.0	61	188
18	3	116.759	0.44	0.71	0.71	76	72	12.5	59	192
19	3	118.157	0.49	0.80	0.80	79	72	12.5	60	191
20	3	119.587	0.50	0.81	0.81	79	73	12.0	62	192
21	3	121.063	0.48	0.78	0.78	80	74	12.5	60	190
22	3	122.507	0.48	0.78	0.78	80	74	12.0	61	188
23	3	123.955	0.43	0.71	0.71	80	74	10.0	60	190
24	3	125.362	[illegible]	[illegible]	0.40	78	75			

% CO_2	% O_2	% N_2
13.4	4.2	
13.0	4.3	
12.5	4.4	
12.97	4.3	82.73

MEASE ENGINEERING ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PARTICULATE FIELD DATA

RUN No. 3
LOCATION Atlantic States
DATE 9/29/80
OPERATOR MEASE/[illegible]
SAMPLE BOX No. 3

TIME, START 12:21 pm
TIME, FINISH 1:40
WASH BOTTLE No. 3/3
STACK DIMEN. 59.375" Ø
SAMPLE BOX TEMP. °F 230
STACK PRESS., in. H_2O -0.20

AMBIENT TEMP. °F 60
BAR. PRESS. "Hg. 30.372
ASSUMED MOISTURE % 38
HEATER BOX SETTING, °F 230
PROBE TIP DIA., 0.251" No.
PROBE LENGTH 5' glass No.
PROBE HEATER SETTING 85

INITIAL DRY GAS METER READING 127.433

POINT	CLOCK TIME	DRY GAS METER, CF	PITOT In. H_2O ΔP	ORIFICE ΔH In. H_2O DESIRED	ORIFICE ΔH In. H_2O ACTUAL	DRY GAS TEMP. °F INLET	DRY GAS TEMP. °F OUTLET	PUMP VACUUM In. Hg. GAUGE	IMPINGER TEMP. °F	STACK TEMP. °F
	3	28.723	0.37	0.61	0.61	69	70	12.0	[illegible]	177
	3	130.009	0.37	0.61	0.61	70	70	12.0	62	[illegible]
	3	131.300	0.38	0.62	0.62	72	71	11.5	60	[illegible]
	3	132.621	0.40	0.65	0.65	75	71	11.5	60	187
	3	133.914	0.38	0.61	0.61	77	72	11.5	61	186
	3	135.247	0.40	0.65	0.65	80	72	11.5	[illegible]	190
	3	136.704	0.49	0.80	0.80	81	74	12.0	[illegible]	188
	3	138.166	0.48	0.79	0.79	83	74	12.0	58	191
	3	139.527	0.45	0.74	0.74	84	74	12.0	59	191
	3	[illegible]	0.44	0.72	0.72	86	76	[illegible]	[illegible]	[illegible]
	3	142.359	0.41	0.68	0.68	87	76	[illegible]	[illegible]	190
	3	143.460	0.25	0.42	0.42	87	77	11.0	[illegible]	
		[illegible]								
13	3	144.853	0.41	0.70	0.70	78	76	12.0	[illegible]	181
14	3	146.206	0.40	0.66	0.66	79	79	12.0	62	[illegible]
15	3	147.526	0.39	0.64	0.64	81	78	12.0	[illegible]	[illegible]
16	3	148.870	0.39	0.64	0.64	82	78	11.5	56	191
17	3	150.174	0.39	0.64	0.64	85	78	12.0	58	[illegible]
18	3	151.550	0.41	0.67	0.67	86	78	12.0	[illegible]	[illegible]
19	3	152.868	0.39	0.64	0.64	86	78	12.0	[illegible]	[illegible]
20	3	154.198	0.39	0.64	0.64	85	79	12.0	[illegible]	[illegible]
21	3	155.452	0.34	0.56	0.56	84	80	11.0	[illegible]	187
22	3	156.678	0.33	0.55	0.55	82	78	11.0	56	185
23	3	157.880	0.30	0.50	0.50	82	78	10.5	[illegible]	180
	3		[illegible]	[illegible]	[illegible]	82	78			