

ABMA

American
Boiler Manufacturers
Association

1500 Wilson Boulevard
Arlington VA 22209

DoE

United States
Department
of Energy

Division of Power Systems
Energy Technology Branch
Washington DC 20545

EPA

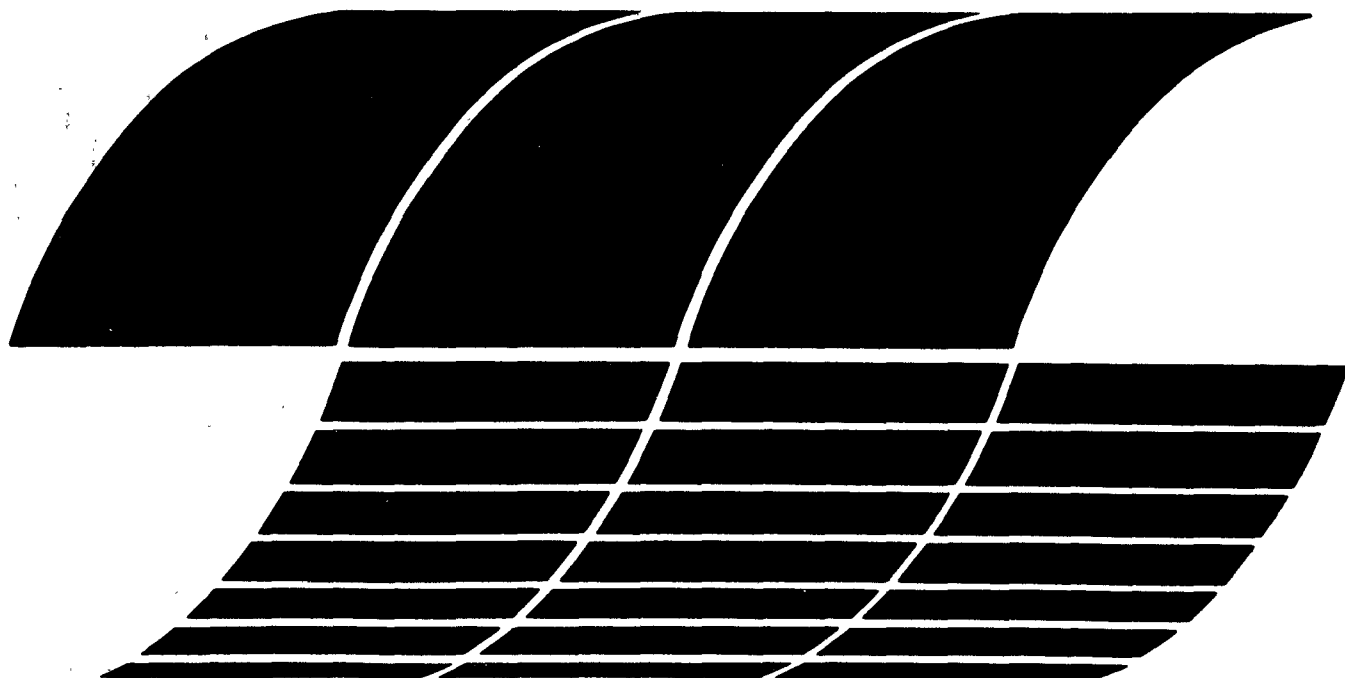
United States
Environmental Protection
Agency

Industrial Environmental Research
Laboratory
Research Triangle Park NC 27711

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April 1981

Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement — Sites L1-L7 (Data Supplement)

**Interagency
Energy/Environment
R&D Program Report**



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This report has been assigned to the INTERAGENCY ENERGY-ENVIRONMENT RESEARCH AND DEVELOPMENT series. Reports in this series result from the effort funded under the 17-agency Federal Energy/Environment Research and Development Program. These studies relate to EPA's mission to protect the public health and welfare from adverse effects of pollutants associated with energy systems. The goal of the Program is to assure the rapid development of domestic energy supplies in an environmentally-compatible manner by providing the necessary environmental data and control technology. Investigations include analyses of the transport of energy-related pollutants and their health and ecological effects; assessments of, and development of, control technologies for energy systems; and integrated assessments of a wide range of energy-related environmental issues.

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April 1981

Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement — Sites L1-L7 (Data Supplement)

by

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and

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FOREWORD

The purpose of this Data Supplement Volume is to document data in greater detail than was practical in the Final Technical Report.¹ It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations and conclusions. The Final Technical Report also contains data summaries not found in this volume.

The data in this volume are arranged by Test Sites, L1 through L7, and within each site by type (i.e., Particulate Field Data Sheets, Particulate Lab Worksheet, etc.). The boilers tested are referred to as Boiler L1 through L7 to correspond with the seven sites included in the Site L part of the program entitled, "A Testing Program to Update Equipment Specifications and Design Criteria for Stoker Fired Boilers."

¹ J. W. Davis and H. K. Owens, "Field Tests of Institutional Stoker Coal-Fired Boilers for Emissions Control - Site L."

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CONVERSION FACTORS

ENGLISH AND METRIC UNITS TO SI UNITS

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
in	cm	2.540
in ²	cm ²	6.452
ft	m	0.3048
ft ²	m ²	0.09290
ft ³	m ³	0.02832
lb	Kg	0.4536
lb/hr	Mg/s	0.1260
lb/10 ⁶ BTU	ng/J	430
g/Mcal	ng/J	239
BTU	J	1054
BTU/lb	J/kg	2324
BTU/hr	W	0.2929
J/sec	W	1.000
J/hr	W	3600
BTU/ft/hr	W/m	0.9609
BTU/ft/hr	J/hr/m	3459
BTU/ft ² /hr	W/m ²	3.152
BTU/ft ² /hr	J/hr/m ²	11349
BTU/ft ³ /hr	W/m ³	10.34
BTU/ft ³ /hr	J/hr/m ³	37234
psia	Pa	6895
"H ₂ O	Pa	249.1
Rankine	Celsius	C = 5/9R-273
Fahrenheit	Celsius	C = 5/9(F-32)
Celsius	Kelvin	K = C+273
Rankine	Kelvin	K = 5/9R

CONVERSION FACTORS

SI UNITS TO ENGLISH AND METRIC UNITS

<u>To Convert From</u>	<u>To</u>	<u>Multiply By</u>
cm	in	0.3937
cm ²	in ²	0.1550
m	ft	3.281
m ²	ft ²	10.764
m ³	ft ³	35.315
Kg	lb	2.205
Mg/s	lb/hr	7.937
ng/J	lb/10 ⁶ BTU	0.00233
ng/J	g/Mcal	0.00418
J	BTU	0.000948
J/kg	BTU/lb	0.000430
J/hr/m	BTU/ft/hr	0.000289
J/hr/m ²	BTU/ft ² /hr	0.0000881
J/hr/m ³	BTU/ft ³ /hr	0.0000269
W	BTU/hr	3.414
W	J/hr	0.000278
W/m	BTU/ft/hr	1.041
W/m ²	BTU/ft ² /hr	0.317
W/m ³	BTU/ft ³ /hr	0.0967
Pa	psia	0.000145
Pa	"H ₂ O	0.004014
Kelvin	Fahrenheit	F = 1.8K-460
Celsius	Fahrenheit	F = 1.8C+32
Fahrenheit	Rankine	R = F+460
Kelvin	Rankine	R = 1.8K

SI PREFIXES

<u>Multiplication Factor</u>	<u>Prefix</u>	<u>SI Symbol</u>
10^{18}	exa	E
10^{15}	peta	P
10^{12}	tera	T
10^9	giga	G
10^6	mega	M
10^3	kilo	k
10^2	hecto*	h
10^1	deka*	da
10^{-1}	deci*	d
10^{-2}	centi*	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

*Not recommended but occasionally used

SECTION 1.0

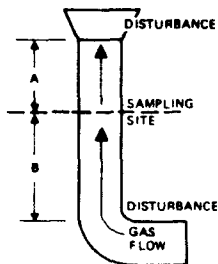
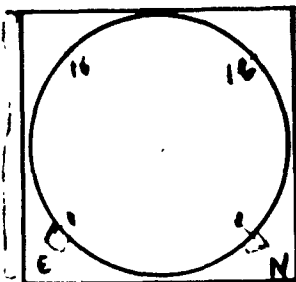
SITE L1 DATA

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PARTICULATE FIELD DATA

Leak Test 0.019 @ 45" H₂O 1/2

SCHEMATIC OF STACK



CROSS SECTION

Stack 0830 - 9:50

PLANT L-1
DATE 4/20/78
LOCATION Root
OPERATOR Dave Anderson
STACK NO. Slab
RUN NO. 1
SAMPLE BOX NO. RAC (OLD)
METER BOX NO. CAES

AMBIENT TEMPERATURE 48
BAROMETRIC PRESSURE 28.9
ASSUMED MOISTURE, % 5%
PROBE LENGTH, in. 60'
NOZZLE DIAMETER, in. 3/8
STACK DIAMETER, in. 37 1/4
PROBE HEATER SETTING 250
HEATER BOX SETTING 250

METER ΔH_g 1.8
C FACTOR 0.065

PROCESS WEIGHT RATE

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP _s) (√ΔP _s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O ACTUAL DESIRED		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER (1) INLET (T _{m IN}), °F (2) OUTLET (T _{m OUT}), °F		(4) SAMPLE BOX TEMPERATURE °F	(3) TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
N-1	5	-0.13	240*	0.37	0.608	4.1	4.1	637.375	54 53	52	173	50	5"
2	5	"	240*	0.37	0.608	4.1	4.1		72 63	54	222	58	5"
3	5	"	540	0.38	0.616	4.1	4.1		79 68	57	252	66	6"
4	5	"	546	0.38	0.616	4.1	4.1	653.20	87 74	61	267	78	6"
5	5	"	537	0.44	0.663	4.7	4.7		94 80	66	271	83	7"
6	5	.13	548	0.45	0.671	4.8	4.8		98 83	68	270	84	7"
7	5	.13	560	0.52	0.721	5.5	5.5		98 84	76	273	83	7.2
8	5	"	560	0.50	0.707	5.3	5.3		99 85	71	275	84	7.2
9	5	"	560	0.45	0.671	4.8	4.8	681.68	90 81	72	235	72	6.3
10	5	"	566	0.53	0.728	5.6	5.6		96 85	74	250	75	2.2
11	5	"	540	0.40	0.707	5.3	5.3		101 89	71	257	74	7.0
12	5	"	553	0.40	0.632	4.3	4.3		102 90	78	253	75	6.0
13	5	"	553	0.40	0.632	4.3	4.3		103 91	79	249	76	6.0
14	5	"	550	0.38	0.616	4.1	4.1		102 90	80	239	73	5.8
15	5	"	548	0.35	0.592	3.8	3.8		101 91	81	233	70	5.0
TOTAL 16	5	"	543	0.35	0.592	3.8	3.8	727.63	102 92	82	225	68	5.0

T. AVERAGE

Average 5 -0.13

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
FINAL	87	181	44		258
INITIAL	100	100	0		200
LIQUID COLLECTED	13	81	44		58
TOTAL VOLUME COLLECTED	112	181	44		170

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2		10	90	0	20
3					
4					

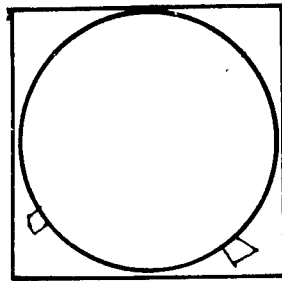
COMMENTS:

* Did not use in calculating Avg. 100 Close to 100 100 100 100

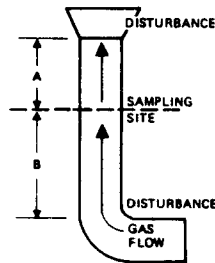
PARTICULATE FIELD DATA

2000 100 1000 @ 15" 3/2

SCHEMATIC OF STACK



CROSS SECTION
 Start 10:00 - 11:35



PLANT L-1
 DATE 4/20/78
 LOCATION Root
 OPERATOR Dennis
 STACK NO. St-6
 RUN NO. 1
 SAMPLE BOX NO. PAC (old)
 METER BOX NO. RAES

AMBIENT TEMPERATURE 50-52
 BAROMETRIC PRESSURE 28.94
 ASSUMED MOISTURE, % 5.10
 PROBE LENGTH, in. 60"
 NOZZLE DIAMETER, in. 3/8"
 STACK DIAMETER, in. 37 1/4"
 PROBE HEATER SETTING 250
 HEATER BOX SETTING Full

METER ΔH_p 1.8
 C FACTOR 0.168
 PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
E-1	5	- .13	540	.35	.592	3.8	3.8	727.63	76 75	74	180	51	5.2
2	5	"	538	.35	.592	3.8	3.8	733	85 80	75	220	56	5.3
3	5	"	530	.37	.608	4.0	4.0	738	92 84	76	243	58	5.8
4	5	"	538	.39	.624	4.3	4.3	743	97 87	77	259	63	6.0
5	5	"	538	.43	.656	4.7	4.7	748	99 88	77	245	65	6.5
6	5	"	537	.42	.648	4.6	4.6	754	102 91	80	233	68	6.5
7	5	"	540	.43	.671	5.0	5.0	760	104 93	82	220	69	7.0
8	5	"	551	.53	.728	5.9	5.9	766	103 73	83	222	69	7.8
9	5	"	551	.45	.671	4.6	4.6	772	103 93	83	233	70	6.5
10	5	"	559	.47	.696	5.2	5.2	778	105 94	83	242	68	7.0
11	5	"	555	.48	.671	4.6	4.6	784	105 94	83	245	67	7.0
12	5	"	553	.40	.632	4.4	4.4	790	104 94	84	254	65	6.5
13	5	"	553	.40	.632	4.4	4.4	796	102 93	84	257	64	6.5
14	5	"	544	.40	.632	4.4	4.4	802	100 91	82	255	65	6.5
15	5	"	550	.38	.616	4.0	4.0	808	100 91	82	252	64	6.0
TOTAL	5.	"	546	.35	.592	3.9	3.9	813	100 91	82	240	63	6.0

Total AVERAGE 160
 Average

- .13

15.381

549

IMPINGER VOLUME ml

SILICA GEL WEIGHT,

10.35

143.3

4.48

818.33

180.96

ORSAT MEASUREMENT

2732

85.4

TIME

77.14

242

COMMENTS.

2194

68.6

CO₂

200.5

6.3

O₂

VOLUME OF LIQUID WATER COLLECTED	1	2	3	4	9
FINAL					
INITIAL					
LIQUID COLLECTED					
TOTAL VOLUME COLLECTED					

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2					
3					
4					

PARTICULATE LAB WORKSHEET

Site Desig. L1

Date April 2012

Sample Loc. _____

	beaker #	final wt (gm)	initial wt (gm)	Δ wt (gm)
Impinger catch and H ₂ O rinse after filter (water sol. only)	<u>H-20</u> <u>H-19</u>	<u>90.5143</u> <u>92.1254</u>	<u>90.5032</u> <u>92.0932</u>	<u>.0111</u> <u>.0322</u>
H ₂ O rinse before filter (water sol. only)	<u>H-18</u>	<u>93.0667</u>	<u>92.9342</u>	<u>.1325</u>
Acetone rinse after filter	<u>H-14</u>	<u>94.4984</u>	<u>94.4746</u>	<u>.0038</u>
Acetone rinse before filter	<u>H-17</u>	<u>93.5020</u>	<u>93.4106</u>	<u>.0922</u>
	Filter #			
Impinger catch and H ₂ O rinse after filter (water insol. only)	<u>23-.8</u> <u>30-.45</u> <u>26-.22</u>	<u>.07500</u> <u>.10314</u> <u>.09846</u>	<u>.07312</u> <u>.10248</u> <u>.09674</u>	<u>.00182</u> <u>.00666</u> <u>.00172</u>
H ₂ O rinse before filter (water insol. only)	<u>24-.8</u> <u>31-.45</u> <u>21-.22</u>	<u>.06700</u> <u>.10150</u> <u>.09718</u>	<u>.07204</u> <u>.10775</u> <u>.09718</u>	<u>.4446</u> <u>.00002</u> <u>—</u>
Test Filter	<u>101</u>	<u>1.99400</u>	<u>.69245</u>	<u>1.3016</u>
TOTAL MASS				<u>.212178</u>

Dry Gas Meter Vol. (ft³)
 Final 816.33
 Initial 637.375
 Δ DgV 180.96

Imp. Water Vol. (Ml.)	1	2	3	4
	<u>87</u>	<u>181</u>	<u>44</u>	<u>252</u>
	<u>100</u>	<u>100</u>	<u>0</u>	<u>0</u>
	<u>-13</u>	<u>81</u>	<u>44</u>	<u>252</u>
Total H ₂ O			<u>170</u>	

IMPACTOR DATA SHEET

Site Desig. L 1

Date 4/19/78

Sample Location SACK

Sample No. _____

Pb 27-14" Hg

Assmd Moisture 4%

Noz. Dia. 5/16"

Stk. Dia 37.25"

Sample Point _____

Sample Time 90 min

Stat P -.13" H₂O

Pitot Tube ΔP .469" H₂O

Stk T 538° F

ΔH Orifice 2.61" H₂O

Liquid Col. 63.9 ml

Sample Vol. 74.75 scf

<u>D_p</u>	<u>Net Wt. (milligm)</u>	<u>Percent</u>
<u>125.0</u>	<u>82.19</u>	<u>14.33</u>
<u>45.0</u>	<u>24.3</u>	<u>4.24</u>
<u>30.0</u>	<u>19.7</u>	<u>3.44</u>
<u>20.0</u>	<u>163.22</u>	<u>28.47</u>
<u>9.46</u>	<u>47.54</u>	<u>8.29</u>
<u>5.85</u>	<u>43.72</u>	<u>7.63</u>
<u>3.93</u>	<u>36.12</u>	<u>6.45</u>
<u>2.64</u>	<u>31.85</u>	<u>5.56</u>
<u>1.66</u>	<u>25.24</u>	<u>4.37</u>
<u>.77</u>	<u>21.05</u>	<u>3.67</u>
<u>.43</u>	<u>26.78</u>	<u>4.50</u>
<u>.24</u>	<u>52.03</u>	<u>9.07</u>
Total	<u>573.38</u> Milligrms	

IMPACTOR DATA SHEET

Site Desig. L1

Date 4/20/78

Sample Location Boiler Outlet

Sample No. _____

P_b 28.94

Assmd Moisture 5%

Noz. Dia. 3/8

Stk. Dia 36"

Sample Point _____

Sample Time 22 MIN

Stat P -3.3 "H₂O

Pitot Tube ΔP .275 "H₂O

Stk T 365 °F

ΔH Orifice 3.05 "H₂O

Liquid Col. 20 ml

Sample Vol. 25.51 scf

D _p	Net Wt. (milligm)	Percent
<u>125.0</u>	<u>64.18</u>	<u>100</u>
<u>45.0</u>	<u>29.45</u>	<u>70.63</u>
<u>30.0</u>	<u>28.78</u>	<u>57.15</u>
<u>20.0</u>	<u>42.33</u>	<u>48.65</u>
<u>9.15</u>	<u>15.21</u>	<u>32.47</u>
<u>5.65</u>	<u>11.91</u>	<u>28.31</u>
<u>3.80</u>	<u>8.06</u>	<u>22.12</u>
<u>2.55</u>	<u>5.43</u>	<u>15.43</u>
<u>1.60</u>	<u>4.13</u>	<u>11.97</u>
<u>.74</u>	<u>4.20</u>	<u>15.62</u>
<u>.40</u>	<u>4.76</u>	<u>12.53</u>
<u>.22</u>	<u>9.42</u>	<u>10.36</u>
Total	<u>228.14</u> Milligrms	

BAHCO SIZE DATA SHEET

Site Desig. L1

Date 04/19/78

Sample Location STACK

Sample No. _____

P_b 29.14" Hg

Assmd Moisture 5%

Noz. Dia. 1/2"

Stk. Dia 37.25"

Sample Point _____

Sample Time 40 MIN

Stat P -13" H₂O

Pitot Tube ΔP .354" H₂O

Stk T 536° F

ΔH Orifice 9.75" H₂O

Liquid Col. 90 ml

Sample Vol. 66.27 scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligm)	Percent
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<u>125</u>	<u>-</u>	<u>-</u>	<u>36.3</u>	<u>7.8</u>
<u>63</u>	<u>-</u>	<u>-</u>	<u>52.6</u>	<u>11.3</u>
<u>30.89</u>	<u>.0783</u>	<u>.0687</u>	<u>9.6</u>	<u>2.06</u>
<u>27.01</u>	<u>.1197</u>	<u>.0783</u>	<u>41.4</u>	<u>8.9</u>
<u>18.73</u>	<u>.1797</u>	<u>.1197</u>	<u>60.0</u>	<u>12.89</u>
<u>12.7</u>	<u>.2653</u>	<u>.1797</u>	<u>85.6</u>	<u>18.4</u>
<u>6.8</u>	<u>.3410</u>	<u>.2653</u>	<u>75.7</u>	<u>16.27</u>
<u>3.84</u>	<u>.4016</u>	<u>.3410</u>	<u>60.6</u>	<u>13.02</u>
<u>2.48</u>	<u>.4451</u>	<u>.4016</u>	<u>43.5</u>	<u>9.35</u>
Total			<u>465.3</u>	
			Milligrms	

BAHCO SIZE DATA SHEET

Site Desig. L1

Date 04/20/78

Sample Location Boiler Outlet

Sample No. _____

P_b 28.94

Assmd Moisture 5%

Noz. Dia. 3/8"

Stk. Dia 36"

Sample Point _____

Sample Time 120 M.W

Stat P -3.3 "H₂O

Pitot Tube ΔP .295 "H₂O

Stk T 565 °F

ΔH Orifice 3.37 "H₂O

Liquid Col. 116 ml

Sample Vol. 107.3 scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligram)	Percent
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<u>125</u>	<u>-</u>	<u>-</u>	<u>109.7</u>	<u>20.31</u>
<u>63</u>	<u>-</u>	<u>-</u>	<u>79.2</u>	<u>14.66</u>
<u>30.89</u>	<u>.2186</u>	<u>.1970</u>	<u>21.6</u>	<u>4.0</u>
<u>27.01</u>	<u>.2713</u>	<u>.2186</u>	<u>52.7</u>	<u>7.76</u>
<u>18.73</u>	<u>.3199</u>	<u>.2713</u>	<u>48.6</u>	<u>9.0</u>
<u>12.7</u>	<u>.3873</u>	<u>.3199</u>	<u>67.4</u>	<u>12.48</u>
<u>6.8</u>	<u>.4700</u>	<u>.2873</u>	<u>82.7</u>	<u>15.31</u>
<u>3.84</u>	<u>.5129</u>	<u>.4700</u>	<u>42.9</u>	<u>7.94</u>
<u>2.48</u>	<u>.5483</u>	<u>.5129</u>	<u>35.4</u>	<u>6.22</u>
Total			<u>570.2</u>	
			Milligrams	

DATA SHEET

BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-1
DATE APRIL 19-20, 1978
~~PROJECT NO. GSA~~ _____
BOILER NO 4
DURATION OF TEST _____

FACTORS

INTEGRATOR x 400
CHART x 1000

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART	SUPER HEAT TEMP.	FEED WATER TEMP. @ 600N.		FLUE GAS TEMP. @ 600N. OUT	COMB AIR TEMP.	SAT. STM. COND. MM	PRESSURES		F. W. PRESS.	WIND BOX	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	FURN.	DUST COLL. IN-OUT	DUST COLL. OUT	SPRINK. IN-OUT	ROIL CO ₂ %	O ₂ %	CO %	REMARKS	
				IN	OUT				DRUM	HPR.																
APRIL 19, 1978 STACH TRAVERSE / PARTICULATE SIZE TESTS																										
PM 12:30	-	7558	28.0	-	220	-	570	72	-	-	129	182	3.0	-	-	-	-	-	.08	0.9	2.0	93	9.0	10.2	0	Full Ashes, Burn Tube Prior to Test
1:00	-	7585	28.0	-	218	-	565	72	-	-	124	182	2.6	-	-	-	-	-	.07	0.7	2.1	91	9.2	10.0	0	Boiler Full Ashes
1:30	-	7631	27.0	-	217	-	550	72	-	-	124	182	2.6	-	-	-	-	-	.07	0.6	2.0	91	9.1	10.0	0	
2:00	-	7655	27.0	-	217	-	555	72	-	-	124	182	2.6	-	-	-	-	-	.07	0.7	1.9	95	8.9	10.3	0	
2:30	-	7688	27.0	-	217	-	560	72	-	-	124	182	2.6	-	-	-	-	-	.07	0.6	1.9	95	8.8	10.3	0	
3:00	-	7718	27.5	-	216	-	560	72	-	-	124	182	3.1	-	-	-	-	-	.08	0.7	2.1	92	9.0	10.1	0	
3:30	-	7747	27.5	-	216	-	555	72	-	-	124	182	2.6	-	-	-	-	-	0.07	0.7	1.8	85	9.5	9.7	0	
3:55	-	7775	27.0	-	216	-	550	72	-	-	124	182	2.6	-	-	-	-	-	0.07	0.7	2.0	85	9.4	9.7	0	
AVG.					217		72				124	182										9.1	10.0	0		
* NOTE: FLUE GAS TESTS AT BOILER OUTLET AND PORT LOCATION IN STACH INDICATED THERE WAS NO AIR INFILTRATION BETWEEN THESE TWO POINTS.																										

BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-1 _____
DATE April 12-20, 1978 _____
PROJECT NO. G.S.A. _____
BOILER NO 4 _____
DURATION OF TEST _____

FACTORS

INTEGRATOR x 400
CHART x 1000

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART	SUPER HEAT TEMP.	FEED WATER TEMP. @ BOON		FLUE GAS TEMP. @ BOON DRY	COMB. AIR TEMP.	SAT. STM. COND. MM	PRESSURES		F. W. PRESS.	WIND BOX	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	FURN.	DUST COLL. DRY IN	DUST COLL. DRY OUT	STACH. GEN. FAN AIR	CO ₂ %	O ₂ %	H ₂ O %	REMARKS
				IN	OUT				DRUM	HPR.															
APRIL 20, 1978 PARTICULATE EMISSION / PARTICULATE SIZE TEST																									
AMB:30	8519	28.5	-	217	-	575	72	-	-	129	183	2.9	-	-	-	-	-	.07	1.05	2.9	83	9.9	9.6	0	FULL ASH, BED DOWN PRIOR TO EMISSION TEST.
9:00	1852	8551	29.5	-	217	-	567	72	-	129	183	2.9	-	-	-	-	-	.08	0.8	2.1	83	9.5	9.6	0	START EMISSION TEST. *
9:30	1848	8590	29.5	-	217	-	560	72	-	129	183	2.5	-	-	-	-	-	.07	0.6	2.2	84	9.9	9.7	0	BOILER FAN AUTOMATIC
10:00		8623	28.0	-	217	-	562	74	-	129	183	2.5	-	-	-	-	-	.07	0.8	2.1	69	10.9	8.7	0	
10:30	1989	8660	29.0	-	217	-	560	74	-	129	183	2.4	-	-	-	-	-	.08	0.9	1.9	60	11.1	8.0	0	
11:00	1999	8697	30.8	-	217	-	560	74	-	129	183	2.5	-	-	-	-	-	.07	0.8	2.1	67	10.4	8.6	0	
11:35	1850	8705	29.8	-	217	-	562	74	-	129	183	2.3	-	-	-	-	-	.07	0.7	2.0	78	9.8	9.4	0	END EMISSION TEST. *
COAL SAMPLE	-109																								
AVE				217			73			129	183										72.7	10.0	9.0	0	
TOTAL	9439																								* COAL HOPPER LEVELS AT 8:30 AND 11:35 AM
FLY ASH REMOVED FROM COLLECTOR = 20.5 LBS.																									

SECTION 2.0

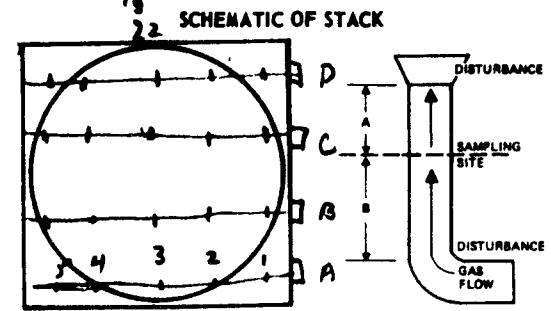
SITE L2 DATA

	<u>PAGE</u>
PARTICULATE FIELD DATA SHEETS	12
PARTICULATE LAB WORKSHEET	14
IMPACTOR DATA SHEETS	15
BAHCO SIZE DATA SHEETS	17
BOILER SYSTEM TEST DATA SHEETS	19

0.115 9.90 $\frac{1}{2}$ ap
0.25 4.06 $\frac{1}{2}$ ap

Leak Test - 003 atm @ 15" H₂O
1 1/2

PARTICULATE FIELD DATA



PLANT L-2
DATE 6/8/78
LOCATION After Collector
OPERATOR Anderson-Davis
STACK NO. Boiler #4
RUN NO. Calibration
SAMPLE BOX NO. RAC
METER BOX NO. RAC
AMBIENT TEMPERATURE 83
BAROMETRIC PRESSURE 28.50
ASSUMED MOISTURE, % 7
PROBE LENGTH, in. 36"
NOZZLE DIAMETER, in. 5/16"
STACK DIAMETER, in. 40" x 22"
PROBE HEATER SETTING 700-1000
HEATER BOX SETTING 250

METER ΔH_0 1.9
C FACTOR 0.32
PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

CROSS SECTION
Start 0900

110
1176

12

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	# 4 STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		# 3 SAMPLE BOX TEMPERATURE °F	# 2 TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m in}), °F	OUTLET (T _{m out}), °F				
D 1	5	-0.48	325	0.21	0.458	1.2	527.435	84	84	172	62	0	
2	5	"	478	0.23	0.480	1.33	530.	86	92	208	60	0	
3	5	"	479	0.25	0.50	1.45	533.875	88	98	237	61	0	
4	5	"	482	0.24	0.510	1.50	537.250	88	104	251	64	0	
5	5	"	485	0.20	0.447	1.16	540.730	90	106	256	66	0	
Totals	25	-0.48	1924		2.395	6.64	543.650		460	1124	313	0	
Avg	5	-0.48	481	0.229	0.479	1.328	16.215		92	235	63	0	
C 1	5	-0.48	385	0.26	0.510	1.50	543.650	94	102	206	65	0	
2	5	"	477	0.23	0.480	1.33	547.09	94	100	226	62	0	
3	5	"	478	0.23	0.480	1.33	550.378	95	101	235	64	0	
4	5	"	479	0.28	0.529	1.62	553.610	96	104	252	66	0	
5	5	"	487	0.30	0.548	1.75	557.170	98	106	272	66	0.5	
							560.942						
TOTAL	50	-0.48	3845		4.941	14.17	33.507		969	2315	636	0	
AVERAGE	5	-0.48	481	0.244	0.499	1.417		97		232	64	0	

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL					
INITIAL					
LIQUID COLLECTED					

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1	47	14.4	4.5	0	81.1
2					
3					
4					

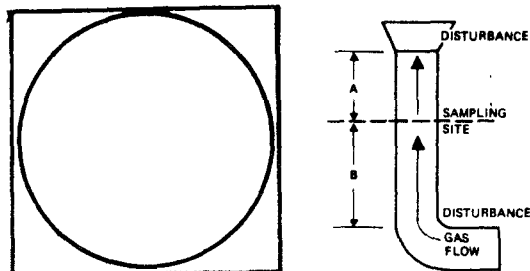
COMMENTS:
* Point 1 was not used in calculating Avg Stack Gas Temp

21-9.7 #AP

End Leak Test @ 15 Hg .005 3/2

PARTICULATE FIELD DATA

SCHEMATIC OF STACK



CROSS SECTION
Start 0900 End 1130

PLANT L-2
DATE 6/8/78
LOCATION After collection
OPERATOR Anderson-Davis
STACK NO. Bailen #4
RUN NO. Certification
SAMPLE BOX NO. RAC
METER BOX NO. RAC

AMBIENT TEMPERATURE 83
BAROMETRIC PRESSURE 28.5
ASSUMED MOISTURE, % 7
PROBE LENGTH, in. 36"
NOZZLE DIAMETER, in. 5/16
STACK DIAMETER, in. 40 x 22
PROBE HEATER SETTING 1
HEATER BOX SETTING 250

METER ΔH_0 1.9
 $5/16 = 0.32$
C FACTOR _____
PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP _s) (√ΔP _s)		PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
						ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
B-1	5 min	-0.48	305 *	0.25	0.50	1.45	1.45	560.942	99	101 104	215	68	0	
2	5	"	483	0.27	0.520	1.57	1.57	564.	98	103 108	223	63	0	
3	5	"	484	0.23	0.48	1.33	1.33	567.947	100	105 110	221	62	0	
4	5	"	483	0.27	0.520	1.57	1.57	571.175	100	106 112	211	63	.5	
5	5	"	486	0.31	0.557	1.80	1.80	574.	101	108 113	211	61	1.0	
TOTAL	25		1936		2.576			578.585						
Avg	5	-0.48	484	0.245	0.515									
A 1	5	-0.48	315 *	0.18	0.424	1.05	1.05	578.895	100	102 104	200	66	0	
2	5	"	477	0.26	0.510	1.50	1.50	581.596	100	105 110	200	65	.5	
3	5	"	480	0.27	0.520	1.57	1.57	585.110	100	107 114	193	61	.5	
4	5	"	483	0.28		1.62	1.62	588.711	100	108 116	196	61	1.0	
5	5	"	487	0.29	0.537	1.70	1.70	592.330	102	109 116	196	62	1.0	
								596.040						
TOTAL	100		7708		10.088	29.33				2023	4381	1264	5	
AVERAGE	5	-0.48	482		0.502	1.466		68.605		101	219	63	0.25	

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL	179	121	4		216
INITIAL	100	100	0		200
LIQUID COLLECTED	79	21	4		16
TOTAL VOLUME COLLECTED					120

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2					
3					
4					

COMMENTS:

PARTICULATE LAB WORKSHEET

Site Desig. L-2

Date June, 7/78

Sample Loc. _____

	beaker #	final wt (gm)	initial wt (gm)	Δ wt (gm)
Impinger catch and H ₂ O rinse after filter (water sol. only)	<u>I-5</u> <u>I-10</u>	<u>91.4640</u> <u>94.6125</u>	<u>91.4558</u> <u>94.6005</u>	<u>.0082</u> <u>.0120</u>
H ₂ O rinse before filter (water sol. only)	<u>I-11</u> <u>I-6</u>	<u>95.5035</u> <u>94.2884</u>	<u>95.4802</u> <u>94.2652</u>	<u>.0233</u> <u>.0232</u>
Acetone rinse after filter	<u>I-12</u>	<u>91.0665</u>	<u>91.0634</u>	<u>.0031</u>
Acetone rinse before filter	<u>I-7</u>	<u>91.4663</u>	<u>91.4396</u>	<u>.0267</u>
	Filter #			
Impinger catch and H ₂ O rinse after filter (water insol. only)	<u>44-.8</u> <u>48-.45</u> <u>41-.22</u>	<u>.08795</u> <u>.09345</u> <u>.08918</u>	<u>.08410</u> <u>.09217</u> <u>.08707</u>	<u>.00385</u> <u>.00128</u> <u>.00211</u>
H ₂ O rinse before filter (water insol. only)	<u>43-.8</u> <u>49-.45</u> <u>40-.22</u>	<u>.23613</u> <u>.09495</u> <u>.08830</u>	<u>.08346</u> <u>.09295</u> <u>.08627</u>	<u>.15267</u> <u>.00200</u> <u>.00203</u>
Test Filter	<u>102</u>	<u>.89665</u>	<u>.65090</u>	<u>.24575</u>
TOTAL MASS				<u>1.13832</u>

Dry Gas Meter Vol. (ft³)

Final 596.040

Initial 527.435

Δ DgV 68.605

Imp. Water Vol. (Ml.)	1	2	3	4
	<u>179</u>	<u>121</u>	<u>4</u>	<u>216</u>
	<u>100</u>	<u>100</u>	<u>0</u>	<u>200</u>
	<u>79</u>	<u>21</u>	<u>4</u>	<u>16</u>
Total H ₂ O				<u>120</u>

IMPACTOR DATA SHEET

Site Desig. L2

Date Jun 7, 78

Sample Location Before Collector

Sample No. _____

P_b 28.5" Hg

Assmd Moisture 7%

Noz. Dia. 1/2"

Stk. Dia 100-18"

Sample Point _____

Sample Time 40 MIN

Stat P -1.2" H₂O

Pitot Tube ΔP .05" H₂O

Stk T 500 °F

ΔH Orifice 2. "H₂O

Liquid Col. 43.66 ml

Sample Vol. 26.68 scf

D _p	Net Wt. (milligm)	Percent
<u>125</u>	<u>137.57</u>	<u>31.19</u>
<u>45</u>	<u>61.95</u>	<u>14.05</u>
<u>30</u>	<u>56.93</u>	<u>12.91</u>
<u>20</u>	<u>73.16</u>	<u>16.59</u>
<u>10</u>	<u>17.95</u>	<u>4.07</u>
<u>6.41</u>	<u>16.26</u>	<u>3.69</u>
<u>4.32</u>	<u>13.20</u>	<u>2.99</u>
<u>2.91</u>	<u>5.73</u>	<u>1.30</u>
<u>1.83</u>	<u>6.06</u>	<u>1.37</u>
<u>.87</u>	<u>13.90</u>	<u>3.15</u>
<u>.49</u>	<u>12.01</u>	<u>2.72</u>
<u>.288</u>	<u>26.36</u>	<u>5.98</u>
Total	<u>441.08</u> Milligrams	

IMPACTOR DATA SHEET

Site Desig. L-2

Date Jun 7, 78

Sample Location After Collector

Sample No. _____

P_b 28.64

Assmd Moisture 7%

Noz. Dia. 1/4"

Stk. Dia 40"-22"

Sample Point _____

Sample Time 105 MIN

Stat P -.48"H₂O

Pitot Tube ΔP .28"H₂O

Stk T 490 °F

ΔH Orifice .98"H₂O

Liquid Col. .68 ml

Sample Vol. 44.51 scf

D _p	Net Wt. (milligm)	Percent
<u>125</u>	<u>188.33</u>	<u>28.09</u>
<u>45</u>	<u>95.79</u>	<u>14.29</u>
<u>30</u>	<u>88.84</u>	<u>13.25</u>
<u>20</u>	<u>109.62</u>	<u>16.35</u>
<u>10.</u>	<u>25.14</u>	<u>3.75</u>
<u>8.14</u>	<u>25.67</u>	<u>3.83</u>
<u>5.49</u>	<u>21.62</u>	<u>3.22</u>
<u>3.72</u>	<u>18.92</u>	<u>2.82</u>
<u>2.36</u>	<u>16.07</u>	<u>2.40</u>
<u>1.14</u>	<u>13.88</u>	<u>2.07</u>
<u>.67</u>	<u>18.35</u>	<u>2.73</u>
<u>.42</u>	<u>48.35</u>	<u>7.21</u>
Total	<u>670.56</u> Milligrms	

BAHCO SIZE DATA SHEET

Site Desig. L2

Date 7 Jun 78

Sample Location Before Collector

Sample No. _____

P_b 28.5" Hg

Assmd Moisture 7 %

Noz. Dia. 1/2

Stk. Dia 100"-18"

Sample Point _____

Sample Time 51

Stat P -.2 "H₂O

Pitot Tube ΔP .05 "H₂O

Stk T 500°F

ΔH Orifice 2.0 "H₂O

Liquid Col. 56.34 ml

Sample Vol. 34.8 scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligram)	Percent
125	—	—	66.7	17.73
63.0	.0390	.0352	49.5	13.16
30.89	.1304	.0390	91.4	24.30
27.01	.1669	.1304	36.5	9.7
18.73	.1940	.1669	27.1	7.21
12.7	.2326	.1940	38.6	10.26
6.8	.2644	.2326	31.8	8.46
3.84	.2829	.2644	18.5	4.92
2.48	.2989	.2829	16.0	4.25
Total			376.1	
			Milligrms	

BAHCO SIZE DATA SHEET

Site Desig. L 2

Date 7 Jun 78

Sample Location After Collector

Sample No. _____

P_b 28.61

Assmd Moisture 7.0

Noz. Dia. 3/8

Stk. Dia 40.22

Sample Point _____

Sample Time 100 MIN

Stat P .45 "H₂O

Pitot Tube ΔP .258 "H₂O

Stk T 486 °F

ΔH Orifice 3.62 "H₂O

Liquid Col. 153 ml

Sample Vol. 93.66 scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligram)	Percent
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<u>125</u>	<u>—</u>	<u>—</u>	<u>176.8</u>	<u>15.41</u>
<u>63</u>	<u>.3062</u>	<u>.2845</u>	<u>313.5</u>	<u>27.32</u>
<u>30.89</u>	<u>.3454</u>	<u>.3062</u>	<u>39.2</u>	<u>3.42</u>
<u>27.01</u>	<u>.4449</u>	<u>.3454</u>	<u>99.5</u>	<u>8.67</u>
<u>18.73</u>	<u>.5652</u>	<u>.4449</u>	<u>120.3</u>	<u>10.48</u>
<u>12.7</u>	<u>.6941</u>	<u>.5652</u>	<u>128.9</u>	<u>11.2</u>
<u>6.8</u>	<u>.8373</u>	<u>.6941</u>	<u>143.2</u>	<u>12.48</u>
<u>3.84</u>	<u>.9075</u>	<u>.8373</u>	<u>70.2</u>	<u>6.12</u>
<u>2.48</u>	<u>.9633</u>	<u>.9075</u>	<u>55.8</u>	<u>4.86</u>
Total			<u>1147.4</u> Milligrms	

DATA SHEET

BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-2
DATE JUNE 7-8, 1978
PROJECT NO. G.S.A. _____
BOILER NO. 4
DURATION OF TEST _____

FACTORS

INTEGRATOR x 450
CHART x 1000

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART ST. FLOW INTEG.	SUPER HEAT TEMP. AIR FLOW	FEED WATER TEMP. °C IN	FLUE GAS TEMP. °C OUT	COMB. AIR TEMP. °C OUT	SAT. STM. COND. MM	PRESSURES		F. W. PRESS.	WIND BOX	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5 OUT	FURN.	DUST COLL. DIPA #	DUST COLL. OUT	STACK DEN. R.	CO ₂ %	O ₂ %	CO	REMARKS	
								DRUM	HPR.																
JUNE 7, 1978																									
STACH TRAVERSAL / PARTICULATE SIZE TEST																									
AM 9:00	-	23.0	72117	12.0	230	505	73	-	126	-	192	2.0	0.55	1.3	0.20	0	0.20	0.09	5.3	5.6	-	12.0	-	-	8:40 FULL ASHES, BOOTH
10:00	-	28.0	72125	19.0	230	525	75	-	125	-	193	2.6	0.80	1.7	0.30	0.10	0.30	0.05	5.6	5.8	2.9	14.0	-	-	9:00 BOILER CONTROLLER
11:00	-	25.0	72273	12.5	230	540	78	-	125	-	193	1.9	0.60	1.2	0.20	0	0.30	0.08	5.1	5.9	-	12.5	-	0	FULL AUTOMATIC.
12:00	-	25.0	72292	13.0	230	535	78	-	126	-	193	2.1	0.50	1.2	0.30	0	0.30	0.08	5.4	5.6	-	13.0	-	0	INCREASE LOAD BY
PM 12:30	-	24.5	72318	13.0	230	535	77	-	126	-	193	2.2	0.60	1.4	0.20	0	0.30	0.02	5.6	5.8	-	12.5	-	0	VENTING TO ATMOSPHERE
1:00	-	25.5	72348	14.0	230	540	77	-	126	-	185	2.1	0.50	1.3	0.20	0	0.30	0.06	5.5	5.8	-	14.0	5.1	0	10:00 INCREASE STOVE
1:30	-	24.0	72375	13.5	230	535	76	-	126	-	188	2.4	0.70	1.5	0.30	0.10	0.30	0.07	5.6	5.8	-	13.0	6.0	0	GATE FROM 6" TO 5"
2:00	-	24.5	72402	14.0	230	535	76	-	126	-	193	2.4	0.60	1.5	0.30	0	0.30	0.06	5.6	5.8	-	12.6	5.4	0	HUMID SMOKE EXHAUST (MS)
2:30	-	24.0	72427	13.0	230	530	76	-	126	-	188	2.2	0.50	1.3	0.20	0	0.30	0.03	5.7	5.9	-	13.8	5.2	0	WHEN STOVE VIBRATES.
																									11:15 CLOSED VENT TO
Ave.	-	25.369	-	-	230	-	-	-	126	-	191	-	-	-	-	-	-	-	-	-	13.3	5.4	0		REDUCE LOAD.
																									1:00 PM DECREASED GATE
																									HEIGHT TO 6"
* NOTE: FLUE GAS TESTS AT BOILER OUTLET																									
AND PORT LOCATION IN BRICKLINE																									
INDICATED THERE WAS NO AIR INFILTRATION																									
BETWEEN THESE TWO POINTS.																									

19

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site 1-2
DATE JUNE 2-8, 1978
PROJECT NO. G.S.A. _____
BOILER NO. 4
DURATION OF TEST _____

FACTORS
INTEGRATOR x 2.50
CHART x 1000

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART	SUPER HEAT TEMP.	FEED WATER TEMP. @ ECON.	FLUE GAS TEMP. @ ECON.	COMB. AIR TEMP.	SAT. STM. COND. MM	PRESSURES	F. W. PRESS.	WIND BOX	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	FURN.	DUST COLL. DIFF. IN	DUST COLL. OUT	STACK DEN. R.	CO ₂	O ₂	CO	REMARKS		
		SE FLOW INTEG.	AIR FLOW	IN	OUT	OUT		DRUM HPR.			1	2	3	4	5										
JUNE 8, 1978 PARTICULATE EMISSION / PARTICULATE SIZE TESTS																									
AM 9:00	—	25.0	73230	11.0	229	560	75	—	125	—	198	1.9	0.35	1.2	0.20	0	0.20	0.09	5.0	5.2	—	14.7	4.2	0	7:45 PULL ASH, BLW. TURN
9:30	1680	25.0	73235	12.0	229	560	75	—	126	—	190	2.4	0.35	1.9	0.20	0	0.20	0.05	5.6	5.8	—	14.5	4.5	0	9:00 LEVEL COAL HOPPER,
10:00	—	24.5	73233	11.0	229	560	75	—	125	—	194	1.75	0.35	1.1	0.20	0	0.20	0.08	5.0	5.3	—	14.6	4.4	0	START TILT. WINDING
10:30	2300	25.0	73316	12.0	229	560	76	—	126	—	197	1.70	0.30	1.1	0.25	0	0.20	0.10	5.2	5.4	—	14.2	4.7	0	STEADY TO MAINTAIN COAL.
11:00	—	24.5	73341	11.0	230	560	75	—	126	—	193	1.65	0.25	1.0	0.20	0	0.20	0.10	5.6	5.8	—	14.3	4.5	0	CONTINUE FULL AUTOMATIC.
11:25	2340	26.0	73365	13.0	230	560	76	—	126	—	185	1.9	0.30	1.15	0.25	0	0.20	0.07	5.6	5.8	—	14.1	4.7	0	STOPPED GATE 2 1/2"
	6320																							11:15 LEVEL COAL HOPPER.	
COAL SAMPLE	— 90																							END EMISSION TEST	
TOTAL	6820	25.207	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
AVG	—	25.207	—	—	229	—	76	—	126	—	193	—	—	—	—	—	—	—	—	14.4	4.5	0	12:40, PULL ASH		
																								1:50 PULL SAFETY	
PM 1:10	—	24.0	73484	12.5	230	560	79	—	126	—	190	1.2	0.40	1.3	0.20	0	0.20	0.09	5.8	5.4	—	14.3	4.5	0	6:45 STOPPED GATE
2:10	—	23.5	73511	12.0	230	560	79	—	126	—	193	1.4	0.25	1.0	0.15	0	0.20	0.09	4.8	4.4	—	14.1	4.8	0	DESCRIBED TO 5 1/2"
2:40	—	24.0	73538	12.5	230	560	79	—	126	—	185	1.5	0.25	0.95	0.15	0	0.20	0.09	4.6	4.8	—	14.4	4.6	0	3:15 SEVERE RAINWATER,
3:10	—	22.5	73563	12.5	230	560	78	—	125	—	193	1.7	0.30	1.0	0.20	0	0.20	0.07	5.6	5.8	—	14.0	4.8	0	COAL STOPPED 2,000 LB/HQ
3:40	—	23.0	73589	12.5	230	560	77	—	126	—	185	2.3	0.20	1.5	0.40	0	0.30	0.08	5.7	6.0	—	13.8	5.0	0	WINDING 12,000 LB/HQ
4:45	—	23.0	73649	13.0	230	560	74	—	124	—	190	1.2	0.40	0.70	0.20	0	0.20	0.07	4.8	5.0	—	—	—	—	STACK BENEFIT NO. 4 AND ABOVE.
AVG.	—	—	—	—	230	—	78	—	126	—	193	—	—	—	—	—	—	—	—	14.1	4.7	0	4:40 COAL RETURNED TO NORMAL - STACK CLEAR.		
* NOTE:	FLUE GAS TESTS AT BOILER OUTLET AND PORT LOCATION IN BRICKSHIM INDICATES THERE WAS NO AIR INFILTRATION BETWEEN THESE TWO POINTS																								

SECTION 3.0

SITE L3 DATA

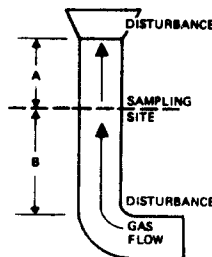
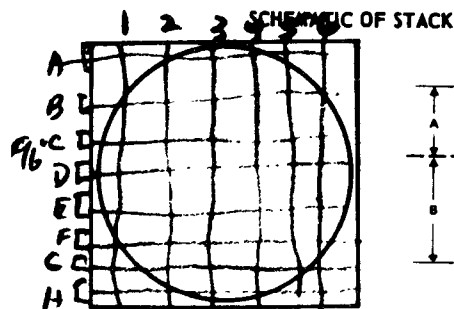
	<u>PAGE</u>
PARTICULATE FIELD DATA SHEETS	22
PARTICULATE LAB WORKSHEET	25
IMPACTOR DATA SHEETS	26
BAHCO SIZE DATA SHEETS	28
BOILER SYSTEM TEST DATA SHEETS	30

6709 $\frac{1}{8}$ AP
48"

PARTICULATE FIELD DATA

Start Leak Test @ 15" Hg @ 0.002

3



CROSS SECTION
Start 0810

PLANT L-3
DATE 6/15/78
LOCATION Roof in Branching
OPERATOR Anderson-Davis
STACK NO. Boiler # 1
RUN NO. Certification
SAMPLE BOX NO. RAC
METER BOX NO. RAC

AMBIENT TEMPERATURE 55
BAROMETRIC PRESSURE 28.96
ASSUMED MOISTURE, % 5
PROBE LENGTH, in. 66"
NOZZLE DIAMETER, in. 1/2"
STACK DIAMETER, in. 96" X 48"
PROBE HEATER SETTING Full
HEATER BOX SETTING 250

METER ΔH_g 1.7
C FACTOR .042

PROCESS WEIGHT RATE

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	# 2 STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP _s) (√ΔP _s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		# 3 SAMPLE BOX TEMPERATURE °F	# 4 TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps		
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F						
A	1	5 min	-.64	390	.035	1.87	1.53	1.53	640.50	64	64	211	57	0	
	2	"	"	425	.042	2.04	1.85	1.85	643.8	80	73	233	49	0	
	3	"	"	425	.037	1.92	1.60	1.60	647.8	88	79	251	52	0	
	4	"	"	429	.030	1.73	1.31	1.31	651.3	92	83	246	56	0	
	5	"	"	416	.028	1.67	1.25	1.25	654.5	96	86	244	59	0	
	6	"	"	410	.025	1.58	0.98	0.98	657.	100	90	244	60	0	
B	1	"	"	391	.037	1.92	1.65	1.65	660.55	94	88	234	59	0	
	2	"	"	418	.040	2.00	1.75	1.75	664.3	100	92	236	55	0	
	3	"	"	416	.030	1.73	1.31	1.31	667.7	104	95	239	53	0	
	4	"	"	408	.025	1.58	1.10	1.10	670.3	104	92	238	54	0	
	5	"	"	402	.022	1.48	0.98	0.98	674.1	105	96	243	54	0	
	6	"	"	387	.020	1.41	.85	.85	676.9	106	97	242	57	0	
C	1	"	"	390	.030	1.73	1.30	1.30	679.65	95	91	227	60	0	
	2	"	"	390	.030	1.73	1.30	1.30	682.9	99	93	236	53	0	
	3	"	"	380	.025	1.58	1.10	1.10	686.2	102	95	232	55	0	
TOTAL	4	"	"	375	.021	1.44	0.86	0.86	689.2	102	95	236	57	0	

VOLUME OF LIQUID WATER COLLECTED

IMPINGER VOLUME ml

SILICA GEL WEIGHT, g

ORSAT MEASUREMENT

TIME	CO ₂	O ₂	CO	N ₂
1				
2				
3				
4				

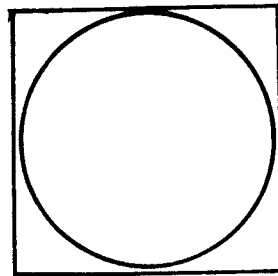
COMMENTS:

Used 0.25 H₂O Magnallic to measure ΔP_s

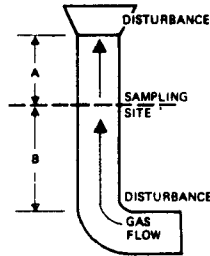
PARTICULATE FIELD DATA

2/3

SCHEMATIC OF STACK



CROSS SECTION



PLANT L-3
 DATE 6/15/78
 LOCATION Rod in Breeding
 OPERATOR Anderson-Davis
 STACK NO. Boiler #1
 RUN NO. Certification
 SAMPLE BOX NO. RAC
 METER BOX NO. RAC

AMBIENT TEMPERATURE 70
 BAROMETRIC PRESSURE 28.93
 ASSUMED MOISTURE, % 5
 PROBE LENGTH, in. 60"
 NOZZLE DIAMETER, in. 1/2"
 STACK DIAMETER, in. 96 x 48
 PROBE HEATER SETTING Full
 HEATER BOX SETTING 250

METER ΔH_g 1.9
 C FACTOR .042
 PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP _s) (√ΔP _s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps			
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F							
1007 23 C	5	5 min	-1.64	370	.018	.1342	0.80	0.80	691.95	103	96	89	235	57	0	
	6	"	"	350	.015		0.68	0.68	691.6	102	95	88	232	69	0	
	1	"	"	390	.030		1.3	1.3	696.94	95	92	89	228	55	0	
	2	"	"	382	.035		1.55	1.55	700.1	100	94	88	236	53	.5	
	3	"	"	372	.028		1.25	1.25	703.7	103	96	89	238	56	.5	
	4	"	"	360	.020		.84	.84	707.0	103	96	89	237	58	0	
1045 E	5	"	"	348	.013		.57	.57	709.7	102	96	90	234	60	0	
	6	"	"	352	.010		.44	.44	712.0	102	96	90	236	62	0	
	1	"	"	383	.018		0.80	0.80	713.94	95	92	89	232	67	0	
	2	"	"	389	.020		.84	.84	716.5	100	95	90	247	59	0	
	3	"	"	338	.015		.66	.66	719.2	100	95	90	248	58	0	
	4	"	"	328	.015		.66	.66	721.7	100	95	90	252	59	0	
1120 F	5	"	"	318	.010		.44	.44	724.0	100	96	92	247	59	0	
	6	"	"	320	.008		.36	.36	726.0	100	96	92	249	60	0	
	1	"	"	360	.028		1.25	1.25	727.83	99	95	91	248	58	.5	
	TOTAL	2	"	372	.028		1.25	1.25	731.0	103	97	91	251	56	.5	
AVERAGE		80	-1.64	5722	2.1843	13.67	734.3	1522	3850	936	2.0					

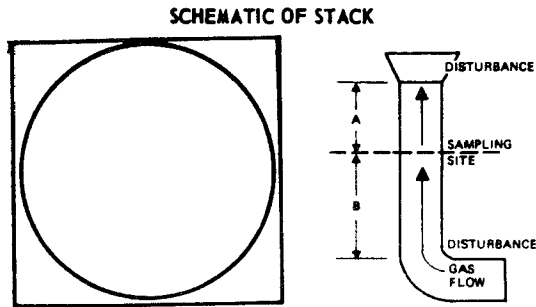
VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL					
INITIAL					
LIQUID COLLECTED					
TOTAL VOLUME COLLECTED					

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2					
3					
4					

COMMENTS:

End Leak Test @ 15" Hg .004 3

PARTICULATE FIELD DATA



CROSS SECTION
END: 1310

PLANT L-3
DATE 6/5/78
LOCATION Root in Branching
OPERATOR Anderson-Davis
STACK NO. Boiler #1
RUN NO. Certification
SAMPLE BOX NO. RAC
METER BOX NO. RAC

AMBIENT TEMPERATURE 70
BAROMETRIC PRESSURE 28.96
ASSUMED MOISTURE, % 5
PROBE LENGTH, in. 60"
NOZZLE DIAMETER, in. 1/2"
STACK DIAMETER, in. 96 x 48
PROBE HEATER SETTING Full
HEATER BOX SETTING 250

METER ΔH_g 1.9
C FACTOR .042
PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m in}), °F	OUTLET (T _{m out}), °F				
F 3	5 min	-.64	370	.025	1.1	1.1	734.3	106	99	92	253	57	0.5
4	"	"	356	.020	.84	.84	837.4	106	99	92	250	58	0
5	"	"	346	.025	1.1	1.1	740.1	110	102	94	253	59	0.5
6	"	"	330	.010	.44	.44	743.3	107	100	93	255	63	0
1200 G 1	"	"	394	.03	1.31	1.31	745.47	99	95	92	232	63	0.5
2	"	"	398	.035	1.55	1.55	749.7	104	98	92	246	55	0.5
3	"	"	399	.038	1.68	1.68	752.2	110	102	94	247	56	0.0
4	"	"	400	.038	1.68	1.68	755.9	114	105	96	254	59	1.0
5	"	"	383	.040	1.75	1.75	759.1	116	106	96	254	61	1.0
6	"	"	362	.03	1.3	1.3	763.3	115	106	97	253	62	0.5
1235 H 1	"	"	360	.03	1.3	1.3	766.73	104	99	94	235	63	0.5
2	"	"	419	.035	1.55	1.55	770.0	106	101	96	256	60	0.5
3	"	"	430	.035	1.55	1.55	773.5	110	103	96	257	60	0.5
4	"	"	420	.035	1.55	1.55	777.2	114	105	96	266	63	0.5
5	"	"	390	.02	.84	.84	781.	114	105	96	270	68	0
TOTAL 6	"	"	400	.03	1.31	1.31	783.	114	105	94	272	70	1.5

AVERAGE 240 18331 2.7301 20.85 786.69 1630 114.55 977 60

VOLUME OF LIQUID WATER COLLECTED

IMPINGER VOLUME ml

SILICA GEL WEIGHT, g

ORSAT MEASUREMENT

TIME CO₂ O₂ CO N₂

FINAL	135	118	5		230.43
INITIAL	100	100	0		200.00
LIQUID COLLECTED	35	18	3		30.43
TOTAL VOLUME COLLECTED					91

1					
2					
3					
4					

COMMENTS: 244 58 2.0

PARTICULATE LAB WORKSHEET

Site Desig. L 3

Date June 15, 78

Sample Loc. _____

	beaker #	final wt (gm)	initial wt (gm)	Δ wt (gm)
Impinger catch and H ₂ O rinse after filter (water sol. only)	<u>S-8</u> <u>S-9</u>	<u>102.5675</u> <u>89.4373</u>	<u>102.5558</u> <u>89.4266</u>	<u>.0117</u> <u>.0107</u>
H ₂ O rinse before filter (water sol. only)	<u>S-22</u>	<u>102.8007</u>	<u>102.7486</u>	<u>.0521</u>
Acetone rinse after filter	<u>S-21</u>	<u>101.7536</u>	<u>101.7536</u>	<u>0</u>
Acetone rinse before filter	<u>S-4</u>	<u>92.0276</u>	<u>91.9756</u>	<u>.0520</u>
	Filter #			
Impinger catch and H ₂ O rinse after filter (water insol. only)	<u>111-.8</u> <u>50-.45</u> <u>43-.22</u>	<u>.09153</u> <u>.09459</u> <u>.08835</u>	<u>.08465</u> <u>.09306</u> <u>.08713</u>	<u>.00688</u> <u>.00159</u> <u>.00122</u>
H ₂ O rinse before filter (water insol. only)	<u>40-.8</u> <u>46-.45</u> <u>44-.22</u>	<u>.08280</u> <u>.07496</u> <u>.08887</u>	<u>.08281</u> <u>.09283</u> <u>.08753</u>	<u>.04899</u> <u>.00213</u> <u>.00134</u>
Test Filter	<u>107</u>	<u>1.53970</u>	<u>.68359</u>	<u>.85611</u>
TOTAL MASS				<u>1.03786</u>

Dry Gas Meter Vol. (ft ³)	Imp. Water Vol. (Ml.)
Final <u>766.69</u>	1 2 3 4
Initial <u>640.54</u>	<u>135</u> <u>118</u> <u>3</u> <u>230.4</u>
Δ DgV <u>146.15</u>	<u>100</u> <u>100</u> <u>0</u> <u>200</u>
	<u>35</u> <u>18</u> <u>3</u> <u>30.4</u>
	Total H ₂ O <u>86</u>

IMPACTOR DATA SHEET

Site Desig. L3

Date June 14, 78

Sample Location TN Breaching

Sample No. _____

P_b 28.94

Assmd Moisture 3 %

Noz. Dia. 1/2"

Stk. Dia 96'-48"

Sample Point _____

Sample Time 80 min

Stat P -.64 "H₂O

Pitot Tube ΔP .039 "H₂O

Stk T 400 °F

ΔH Orifice 1.71 "H₂O

Liquid Col. 37.05 ml

Sample Vol. 53.37 scf

D _p	Net Wt. (milligm)	Percent
<u>125</u>	<u>200.28</u>	<u>30.22</u>
<u>45</u>	<u>111.18</u>	<u>16.77</u>
<u>30</u>	<u>104.41</u>	<u>15.75</u>
<u>20</u>	<u>133.76</u>	<u>20.18</u>
<u>10</u>	<u>23.55</u>	<u>3.55</u>
<u>6.76</u>	<u>16.88</u>	<u>2.55</u>
<u>4.56</u>	<u>14.1</u>	<u>1.83</u>
<u>3.08</u>	<u>7.6</u>	<u>1.45</u>
<u>1.95</u>	<u>7.97</u>	<u>1.20</u>
<u>.94</u>	<u>9.15</u>	<u>1.39</u>
<u>.54</u>	<u>11.01</u>	<u>1.66</u>
<u>.33</u>	<u>24.89</u>	<u>3.76</u>
Total	<u>662.52</u> Milligrms	

IMPACTOR DATA SHEET

Site Desig. L3

Date June 15, 78

Sample Location Boiler Outlet

Sample No. _____

P_b 22.96

Assmd Moisture 5%

Noz. Dia. 1/2"

Stk. Dia 96-24"

Sample Point _____

Sample Time 2 1/2 min

Stat P - .59 "H₂O

Pitot Tube ΔP .038 "H₂O

Stk T 489 °F

ΔH Orifice 1.65 "H₂O

Liquid Col. 11 ml

Sample Vol. 15.19 scf

D _p	Net Wt. (milligm)	Percent
<u>125</u>	<u>78.21</u>	<u>29.78</u>
<u>45</u>	<u>42.78</u>	<u>16.29</u>
<u>30</u>	<u>41.26</u>	<u>15.71</u>
<u>20</u>	<u>56.09</u>	<u>21.36</u>
<u>9.6</u>	<u>9.51</u>	<u>3.62</u>
<u>5.94</u>	<u>8.22</u>	<u>3.13</u>
<u>4.0</u>	<u>6.18</u>	<u>2.35</u>
<u>2.69</u>	<u>3.57</u>	<u>1.36</u>
<u>1.69</u>	<u>2.82</u>	<u>1.07</u>
<u>.79</u>	<u>3.05</u>	<u>1.16</u>
<u>.44</u>	<u>2.97</u>	<u>1.13</u>
<u>.25</u>	<u>7.99</u>	<u>3.04</u>
Total	<u>262.65</u> Milligrms	

BAHCO SIZE DATA SHEET

Site Desig. L 3

Date June 14, 78

Sample Location IN Breaching

Sample No. _____

P_b 28.93

Assmd Moisture 3 %

Noz. Dia. 3/4

Stk. Dia 96"-48"

Sample Point _____

Sample Time 120

Stat P -.64"H₂O

Pitot Tube ΔP .026"H₂O

Stk T 400°F

ΔH Orifice 5.64"H₂O

Liquid Col. 89 ml

Sample Vol. 133.71 scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligram)	Percent
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<u>125</u>	<u>-</u>	<u>-</u>	<u>88</u>	<u>15.61</u>
<u>63</u>	<u>.1552</u>	<u>.1615</u>	<u>134.2</u>	<u>23.01</u>
<u>30.89</u>	<u>.2139</u>	<u>.1852</u>	<u>23.7</u>	<u>1</u>
<u>27.01</u>	<u>.2776</u>	<u>.2139</u>	<u>63.7</u>	<u>1</u>
<u>18.73</u>	<u>.3478</u>	<u>.1716</u>	<u>70.2</u>	<u>1.16</u>
<u>12.7</u>	<u>.4060</u>	<u>.3473</u>	<u>58.2</u>	<u>10.1</u>
<u>6.8</u>	<u>.4672</u>	<u>.4060</u>	<u>61.2</u>	<u>10.26</u>
<u>3.84</u>	<u>.4991</u>	<u>.4672</u>	<u>32.1</u>	<u>5.17</u>
<u>2.48</u>	<u>.5266</u>	<u>.4991</u>	<u>26.7</u>	<u>4.77</u>
Total			<u>65.6</u>	
			Milligrams	

BAHCO SIZE DATA SHEET

Site Desig. L3

Date June 15, 78

Sample Location Baily Outlet

Sample No. _____

P_b 28.96

Assmd Moisture 4%

Noz. Dia. 3/4"

Stk. Dia 96"-24"

Sample Point _____

Sample Time 60 min

Stat P -.59"H₂O

Pitot Tube ΔP .02 "H₂O

Stk T 486 °F

ΔH Orifice 4.4"H₂O

Liquid Col. 49 ml

Sample Vol. 63.81 scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligm)	Percent
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<u>125</u>	<u>—</u>	<u>—</u>	<u>162.3</u>	<u>38.05</u>
<u>63</u>	<u>.2022</u>	<u>.1970</u>	<u>83.3</u>	<u>19.53</u>
<u>30.89</u>	<u>.2143</u>	<u>.2022</u>	<u>12.1</u>	<u>2.84</u>
<u>27.01</u>	<u>.2524</u>	<u>.2143</u>	<u>38.1</u>	<u>8.93</u>
<u>18.73</u>	<u>.2841</u>	<u>.2524</u>	<u>32.7</u>	<u>7.67</u>
<u>12.7</u>	<u>.2174</u>	<u>.2841</u>	<u>33.3</u>	<u>7.81</u>
<u>6.8</u>	<u>.3441</u>	<u>.3174</u>	<u>26.7</u>	<u>6.26</u>
<u>3.84</u>	<u>.3592</u>	<u>.3441</u>	<u>15.1</u>	<u>3.54</u>
<u>2.48</u>	<u>.3814</u>	<u>.3592</u>	<u>22.9</u>	<u>5.37</u>
Total			<u>426.5</u>	
			Milligrms	

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-3
DATE JUNE 18, 1978
PROJECT NO. G.S.A.
BOILER NO. 1
DURATION OF TEST _____

FACTORS
INTEGRATOR X 200
CHART X 1000

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART	SUPER HEAT TEMP.	FEED WATER TEMP. @ ECON		FLUE GAS TEMP. ECON OUT	COMB. AIR TEMP.	SAT. STM. COND. MM	PRESSURES		F. W. PRESS.	WIND BOX +	ZONE 1 +	ZONE 2	ZONE 3	ZONE 4	ZONE 5	FURN. -	DUST COLL. IN MM	DUST COLL. OUT MM	STROK DE-N. O ₂	CO ₂	O ₂	CO	REMARKS
				IN	OUT				DRUM	HPR.															
		INTEG. CHART	AIR/CO ₂																						
		BREKSHINE TRAVINIL / CARISMAZE				500	28																		11:00 FULL ASHES
11:30	-	67092.0	18.0	12.5	230	-	500	28	-	125	1.6	0.01	-	-	-	-	-	0.11	0.55	8.0	16.8	4.0	-	-	
12:00	-	67026.5	16.5	16.5	230	-	495	27	-	118	1.7	0.01	-	-	-	-	-	0.11	0.55	6.0	-	3.0	-	-	
12:30	-	67100.0	16.8	18.0	230	-	495	27	-	110	1.3	0.02	-	-	-	-	-	0.06	0.56	-	-	5.6	17.7	0	
1:00	-	67135.0	18.0	18.0	230	-	495	20	-	110	1.8	0.04	-	-	-	-	-	0.08	0.50	-	-	3.0	-	-	1:05 FULLER ASHES
1:30	-	67166.5	19.0	18.2	230	-	495	21	-	109	1.8	0.04	-	-	-	-	-	0.08	0.50	-	-	4.5	15.9	0	
2:00	-	67195.0	16.8	16.8	230	-	485	21	-	114	1.6	0.05	-	-	-	-	-	0.07	0.54	5.0	-	5.0	15.2	0	
2:30	-	67241.5	16.0	17.7	230	-	495	21	-	108	1.7	0.03	-	-	-	-	-	0.07	0.55	-	-	4.0	-	-	2:45 DUMPER GRAZES
3:00	-	67247.0	12.5	18.0	230	-	495	21	-	102	1.6	0.01	-	-	-	-	-	0.10	0.55	6.0	-	4.5	-	-	
3:30	-	67278.5	16.1	18.0	200	-	500	22	-	114	1.7	0.02	-	-	-	-	-	0.10	0.53	-	-	4.0	-	-	
4:00	-	67282.0	16.1	18.0	230	-	495	22	-	120	1.5	0.02	-	-	-	-	-	0.05	0.52	7.0	16.3	4.5	16.8	0	
4:30	-	67332.5	16.8	18.1	230	-	500	22	-	123	1.6	0.02	-	-	-	-	-	0.08	0.53	6.5	-	4.5	15.7	0	
5:00	-	67340.5	15.0	18.8	230	-	497	23	-	113	1.7	0.04	-	-	-	-	-	0.06	0.54	-	-	4.0	16.0	0	
5:30	-	67382.5	12.8	12.8	230	-	495	23	-	102	2.0	0.09	-	-	-	-	-	0.05	0.54	7.0	16.1	5.2	-	0	
Avg.				230			81		114	235								6.5		4.3					CONTROLS AUTOMATIC

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-3
DATE JUNE 15, 1978
PROJECT NO. G.S.A.
BOILER NO. 1
DURATION OF TEST _____

FACTORS
INTEGRATOR x 300
CHART x 1000

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART <i>INTEG. CHART</i>	SUPER HEAT TEMP. <i>AIR FLOW</i>	FEED WATER TEMP. @ ECON.		FLUE GAS TEMP. ECON OUT	COMB. AIR TEMP.	SAT. STM. COND. MM	PRESSURES		F. W. PRESS.	WIND BOX T	ASH ZONE PIT T	ZONE 2	ZONE 3	ZONE 4	ZONE 5	FURN. -	BUST GALL. AIR IN OUT	DUST COLL. GALL. OUT	STACK DEN. O ₂ R.	CO ₂	O ₂	CO	REMARKS	
				IN	OUT				DRUM	HPR.																
<i>PARTICULATE EMISSION / PARTICULATE SIZE TEST</i>																										
AM 7:30		68227.5	17.3	19.0	222	-	490	64	-	117	-	228	1.6	0.01				0.10	0.57	6.0	-	9.0	-	-	7:15 AM CLEANED FIRE	
8:00	2018	68260.5	16.0	19.2	224	-	495	66	-	117	-	209	1.9	0.01				0.10	0.55	5.8	14.1	4.3	15.7	0	PULLED ASHES	
8:30		68286.5	15.0	17.8	224	-	490	67	-	119	-	255	1.5	0.01				0.10	0.55	5.0	-	5.8	14.1	0	7:45 COAL HOPPER ASHES	
9:00	2020	68324.0	15.0	17.2	225	-	485	68	-	120	-	220	1.6	0.01				0.10	0.55	6.3	13.5	9.2	15.8	0	5X INR 68255.5	
9:30		68355.0	14.4	17.0	228	-	485	70	-	121	-	235	1.5	0.06				0.12	0.55	6.5	13.3	-	-	-		
10:00	2020	68359.5	14.8	16.5	230	-	480	72	-	118	-	208	1.9	0.01				0.10	0.53	6.0	-	-	-	-	10:25 DUMP ONE SHED	
10:30		68387.5	17.5	18.4	230	-	485	72	-	113	-	240	0.9	0.00				0.04	0.55	5.8	14.0	4.6	15.2	0	10:30 DUMP OTHER SHED	
11:00		68414.0	12.8	15.7	230	-	475	73	-	124	-	248	1.4	0.00				0.22	0.50	5.4	14.4	-	-	-		
11:30		68430.5	13.5	16.0	230	-	480	73	-	120	-	240	1.5	0.01				0.10	0.50	5.2	14.7	-	-	-		
12:00	2000	68459.0	13.1	17.0	230	-	480	73	-	119	-	250	1.8	0.02				0.10	0.55	5.6	14.3	4.2	15.6	0		
PM 12:30		68476.0	15.0	17.3	230	-	480	74	-	114	-	225	1.6	0.01				0.04	0.53	6.0	-	6.0	13.8	0		
1:00	2040	68500.0	19.2	17.3	230	-	480	78	-	114	-	240	1.8	0.02				0.02	0.54	6.3	13.4	-	-	-		
1:18	-1750	68513.0	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	-	-	-	-	1:18 END TEST RUN	
1:30	SAMPLE -705	68522.0	13.8	17.5	230	-	470	80	-	109	-	240	1.7	0.00				0.03	0.53	6.4	13.4	-	-	-	1:30 DUMP GRATES	
2:00		68548.5	14.4	17.4	230	-	480	82	-	113	-	222	1.9	0.00				0.06	0.52	6.4	13.4	-	-	-	PULL ASHES	
2:30		68572.5	12.8	15.5	230	-	480	82	-	114	-	227	0.9	0.00				0.24	0.52	6.2	13.6	5.4	14.5	0		
3:00		68592.5	11.5	16.8	230	-	460	84	-	113	-	250	1.5	0.05				0.09	0.50	6.9	12.9	5.8	14.0	0		
3:30		68612.5	12.5	17.3	230	-	460	83	-	107	-	250	1.7	0.02				0.05	0.50	6.5	13.3	5.4	14.4	0	3:55 DUMPED ONE SHED	
4:00		68638.0	16.5	18.2	230	-	470	83	-	111	-	247	1.8	0.01				0.05	0.55	6.8	13.0	-	-	-		
4:30		68670	11.9	17.8	230	-	470	83	-	111	-	249	1.6	0.01				0.21	0.50	6.9	12.9	-	-	-	FINISH TESTING	
Avg					228		75			116		236							6.1						CONTROL AUTOMATIC	

SECTION 4.0

SITE L4 DATA

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IMPACTOR DATA SHEETS	37
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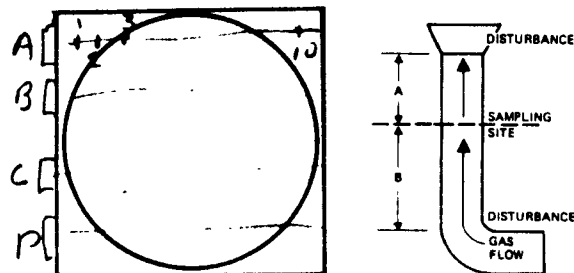
23.07 $\frac{1}{15}$ 40

PARTICULATE FIELD DATA

Leak Test Start: 0.001 CFM
@ 15" Hg

1/3

SCHEMATIC OF STACK

CROSS SECTION
Start 0810PLANT L-4AMBIENT TEMPERATURE 78METER ΔH_g 1.70DATE 7/12/78BAROMETRIC PRESSURE 29.36C FACTOR 146LOCATION Aftn CollectorASSUMED MOISTURE, % 6

PROCESS WEIGHT RATE _____

OPERATOR Anderson-DavisPROBE LENGTH, in. 60"STACK NO. Bailer #4NOZZLE DIAMETER, in. 3/8RUN NO. Certification TestSTACK DIAMETER, in. 24" x 48"SAMPLE BOX NO. RACPROBE HEATER SETTING FullMETER BOX NO. RACHEATER BOX SETTING 250

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

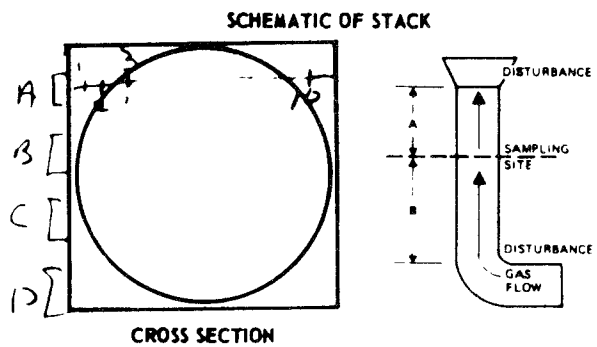
TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP _s) (√ΔP _s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	# 2 GAS SAMPLE TEMPERATURE AT DRY GAS METER		# 3 SAMPLE BOX TEMPERATURE °F	# 4 TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
A 1	5 min	- .55	471	.12	1.5	1.5	953.18	83		197	57	0.5	
2	5	"	492	.15	2.0	2.0	956.77	85		230	49	0.5	
3	5	"	506	.15	2.0	2.0	960.7	91		243	50	0.5	
4	5	"	513	.15	2.0	2.0	964.63	96		255	58	1.0	
5	5	"	517	.14	1.8	1.8	968.74	98		258	61	1.0	
6	5	"	521	.16	2.1	2.1	972.59	101		258	62	2.0	
7	5	"	517	.15	2.0	2.0	976.66	103		251	64	1.5	
8	5	"	519	.20	2.6	2.6	980.63	105		258	63	2.5	
9	5	"	527	.23	2.8	3.0	985.7	108		261	64	3.0	
10	5	"	510	.15	2.0	2.0	990.21	109		264	57	2.0	
	50	- .55	5093	3.984	21			977		2475	585	14.5	
1	5	- .55	490	.12	1.5	1.5	994.7	105		225	59	2.0	
2	5	"	494	.14	1.9	1.9	998.7	108		249	52	2.5	
3	5	"	510	.14	1.9	1.9	1001.93	109		247	54	2.5	
4	5	"	505	.10	1.3	1.3	1005.8	110		249	53	1.5	
TOTAL	70		7092	5.395	276		1009.12	1411		3445	105	22	

AVERAGE

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g	ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
	1	2	3	4							
FINAL											
INITIAL											
LIQUID COLLECTED											
TOTAL VOLUME COLLECTED											

COMMENTS:

PARTICULATE FIELD DATA



PLANT L-4 AMBIENT TEMPERATURE 86
DATE 7/12/78 BAROMETRIC PRESSURE 29.30
LOCATION After Collector ASSUMED MOISTURE, % 6
OPERATOR And - Davis PROBE LENGTH, in. 60"
STACK NO. Boiler #4 NOZZLE DIAMETER, in. 3/8
RUN NO. Calibration STACK DIAMETER, in. 24 x 48
SAMPLE BOX NO. RAC PROBE HEATER SETTING F411
METER BOX NO. RAC HEATER BOX SETTING 250

METER ΔH_g 1.92
C FACTOR .146
PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP _s) (√ΔP _s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
B	5	-.53	501	.08	1.0	1.0	1009.12	109		244	57	.5	
	6	"	510	.12	1.6	1.6	12.2	109		242	54	1.0	
	7	"	515	.15	2.0	2.0	15.75	112		256	53	2.0	
	8	"	512	.16	2.1	2.1	19.7	114		261	57	2.5	
	9	"	506	.18	2.4	2.4	24.09	115		268	51	3.0	
	10	"	504	.19	2.6	2.6	28.6	116		266	52	3.5	
	30	-.55	3048	2.277	11.7			675		1537	115	12.5	
	1	-.55	500	.12	1.6	1.6	1033.29	112		242	58	2.5	
	2	"	502	.10	1.4	1.4	1037.01	113		248	53	2.0	
	3	"	503	.12	1.6	1.6	40.40	114		257	53	2.5	
C	4	"	511	.14	1.9	1.9	44.11	116		256	52	2.5	
	5	"	513	.16	2.2	2.2	48.11	117		263	52	3.0	
	6	"	510	.16	2.2	2.2	52.7	115		250	54	3.0	
	7	"	512	.20	2.7	2.7	56.65	118		263	52	4.0	
	8	"	512	.21	2.9	2.9	61.43	120		268	53	4.0	
	TOTAL	70	7111	5.366	28.2		66.44	1600		3584	745	36	
	AVERAGE												

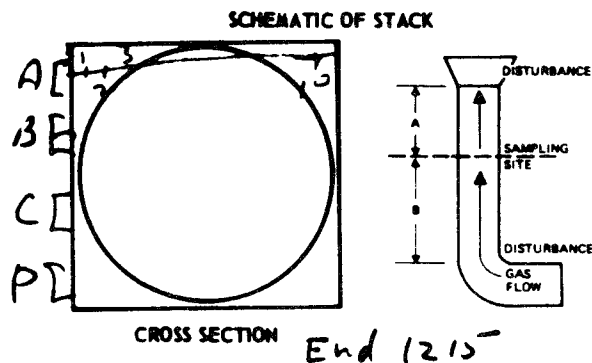
VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g	ORSAT MEASUREMENT					
	1	2	3	4		TIME	CO ₂	O ₂	CO	N ₂	
FINAL						1					
INITIAL						2					
LIQUID COLLECTED						3					
TOTAL VOLUME COLLECTED						4					

COMMENTS:

PARTICULATE FIELD DATA

Leak Test End 1001 EPM
@ 15" Hg

5/3



PLANT L-4 AMBIENT TEMPERATURE 91
 DATE 7/12/78 BAROMETRIC PRESSURE 29.36
 LOCATION After Collector ASSUMED MOISTURE, % 6
 OPERATOR And - Davis PROBE LENGTH, in. 60"
 STACK NO. Boiler #4 NOZZLE DIAMETER, in. 3/8"
 RUN NO. Certification Test STACK DIAMETER, in. 24 x 48
 SAMPLE BOX NO. RAC PROBE HEATER SETTING FEH
 METER BOX NO. RAC HEATER BOX SETTING 250

METER ΔH_g 1.9
 C FACTOR 146
 PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
C 9	5	- .55	509	.23	3.2	3.2	66.44	124		262	54	4.5	
10	5	"	502	.23	3.2	3.2		120		273	53	5.0	
	10	- .55	1011	.9592	6.4			241		435	107	9.5	
D 1	5	- .55	490	.06	.83	.83	76.70	114		219	66	.5	
2	5	"	497	.09	1.2	1.2	79.41	115		243	64	2.5	
3	5	"	515	.09	1.2	1.2	82.60	115		243	63	2.5	
4	5	"	520	.10	1.35	1.35	85.90	118		244	66	2.5	
5	5	"	510	.13	1.8	1.8		119		248	69	3.0	
6	5	"	507	.14	2.6	2.6	93.16	119		244	66	4.0	
7	5	"	495	.20	2.8	2.8	97.86	121		253	65	5.0	
8	5	"	496	.23	3.2	3.2	102.73	123		257	68	5.5	
9	5	"	488	.24	3.4	3.4	108.97	125		259	70	6.0	
10	5	"	480	.20	2.8	2.8	113.4	127		272	73	5.5	
			503	4.7407	27.58		118.23	1437		2917	777	11.5	
TOTAL	800		20206	15.5417	8338		165.05	4448		9946	2325	1045	
AVERAGE		- .55	505	0.158	3.885	2.08		111.2		249	58	26	

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL	200	152	9		242
INITIAL	100	100	0		200
LIQUID COLLECTED	100	52	9		42
TOTAL VOLUME COLLECTED					203

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2					
3					
4					

COMMENTS:

PARTICULATE LAB WORKSHEET

Site Desig. L 4

Date July 11, 1968

Sample Loc. _____

	beaker #	final wt (gm)	initial wt (gm)	Δ wt (gm)
Impinger catch and H ₂ O rinse after filter (water sol. only)	<u>P-21</u> <u>P-22</u>	<u>7.4000</u> <u>11.1380</u>	<u>7.2968</u> <u>11.0381</u>	<u>.0132</u> <u>.0131</u>
H ₂ O rinse before filter (water sol. only)	<u>P-40</u>	<u>7.4000</u>	<u>7.2968</u>	<u>.0132</u>
Acetone rinse after filter	<u>P-29</u>	<u>101.8615</u>	<u>101.8505</u>	<u>.0110</u>
Acetone rinse before filter	<u>P-29</u>	<u>101.8615</u>	<u>101.8505</u>	<u>.0110</u>
	Filter #			
Impinger catch and H ₂ O rinse after filter (water insol. only)	<u>39-.18</u> <u>45-.41</u> <u>45-.22</u>	<u>.09175</u> <u>.08645</u>	<u>.08138</u> <u>.08646</u>	<u>.00037</u> <u>.00005</u>
H ₂ O rinse before filter (water insol. only)	<u>38-.18</u> <u>44-.45</u> <u>46-.22</u>	<u>.08665</u> <u>.09225</u> <u>.08582</u>	<u>.08665</u> <u>.09225</u> <u>.08582</u>	<u>.26120</u> <u>.00173</u> <u>.00062</u>
Test Filter	<u>159</u>	<u>1.17251</u>	<u>.64605</u>	<u>1.32606</u>
TOTAL MASS				<u>1.74376</u>

Dry Gas Meter Vol. (ft³)
 Final 118.23
 Initial 953.18
 Δ DgV 162.55

Imp. Water Vol. (Ml.)	1	2	3	4
	<u>200</u>	<u>100</u>	<u>100</u>	<u>200</u>
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
Total H ₂ O	<u>200</u>	<u>100</u>	<u>100</u>	<u>200</u>

IMPACTOR DATA SHEET

Site Desig. L4

Date July 11, 78

Sample Location After Collector

Sample No. _____

P_b 29.40

Assmd Moisture 6%

Noz. Dia. 3/8"

Stk. Dia 24-48

Sample Point _____

Sample Time 60

Stat P -.55"H₂O

Pitot Tube ΔP .129"H₂O

Stk T 472°F

ΔH Orifice 1.37"H₂O

Liquid Col. 44 ml

Sample Vol. 34.35 scf

D _p	Net Wt. (milligm)	Percent
<u>125</u>	<u>84.36</u>	<u>21.98</u>
<u>45</u>	<u>51.52</u>	<u>13.42</u>
<u>30</u>	<u>51.26</u>	<u>13.36</u>
<u>20</u>	<u>61.47</u>	<u>16.02</u>
<u>10</u>	<u>11.36</u>	<u>2.96</u>
<u>7.15</u>	<u>13.46</u>	<u>3.51</u>
<u>4.82</u>	<u>10.5</u>	<u>2.74</u>
<u>3.26</u>	<u>10.48</u>	<u>2.73</u>
<u>2.06</u>	<u>10.76</u>	<u>2.8</u>
<u>.99</u>	<u>13.14</u>	<u>3.42</u>
<u>.58</u>	<u>16.2</u>	<u>4.39</u>
<u>.35</u>	<u>45.64</u>	<u>12.67</u>
Total	<u>353.8</u> Milligrms	

IMPACTOR DATA SHEET

Site Desig. L 4

Date July 11, 78

Sample Location Before Collector

Sample No. _____

P_b 29.36" Hg

Assmd Moisture 6%

Noz. Dia. 3/8

Stk. Dia 12"-96"

Sample Point _____

Sample Time 45 min

Stat P -.6 "H₂O

Pitot Tube ΔP .1 "H₂O

Stk T 554 °F

ΔH Orifice 1.2 "H₂O

Liquid Col. 35 ml

Sample Vol. 25.51 scf

D _p	Net Wt. (milligm)	Percent
<u>125</u>	<u>86.12</u>	<u>29.37</u>
<u>45</u>	<u>33.65</u>	<u>11.48</u>
<u>30</u>	<u>30.78</u>	<u>10.50</u>
<u>20</u>	<u>44.5</u>	<u>15.18</u>
<u>9</u>	<u>13.68</u>	<u>4.67</u>
<u>7.04</u>	<u>14.82</u>	<u>5.06</u>
<u>4.74</u>	<u>9.73</u>	<u>3.32</u>
<u>3.20</u>	<u>7.23</u>	<u>2.47</u>
<u>2.02</u>	<u>6.87</u>	<u>2.34</u>
<u>.96</u>	<u>6.88</u>	<u>2.35</u>
<u>.55</u>	<u>8.57</u>	<u>2.92</u>
<u>.33</u>	<u>30.36</u>	<u>10.36</u>
Total	<u>293.19</u> Milligrms	

BAHCO SIZE DATA SHEET

Site Desig. L4

Date July 11, 78

Sample Location Before Collector

Sample No. _____

P_b 29.36" H₂O

Assmd Moisture 6%

Noz. Dia. 1/2

Stk. Dia 12"-96

Sample Point _____

Sample Time 50 min

Stat P -.6 "H₂O

Pitot Tube ΔP .09 "H₂O

Stk T 562°F

ΔH Orifice 3.5 "H₂O

Liquid Col. 58 ml

Sample Vol. 43.62 scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligram)	Percent
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
125	-	-	2.3	4.47
63	.0106	.0082	3.5	6.8
30.87	.0133	.0106	2.1	5.24
27.01	.0199	.0133	6.6	12.82
18.73	.0266	.0199	6.1	13.01
12.7	.0431	.0266	16.5	32.04
5.64	.0431	.0431	8.2	15.92
2.48	.0562	.0431	5	9.71
Total			51.5	
			Milligrams	

BAHCO SIZE DATA SHEET

Site Desig. L4

Date July 12, 78

Sample Location APPV Collector

Sample No. _____

P_b 29.36

Assmd Moisture 6%

Noz. Dia. 3/8"

Stk. Dia 24"-48"

Sample Point _____

Sample Time 20:15 N

Stat P -.55"H₂O

Pitot Tube ΔP .129 "H₂O

Stk T 493°F

ΔH Orifice 1.66"H₂O

Liquid Col. 189 ml

Sample Vol. 142.96 scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligram)	Percent
125	-	-	815.4	36.8
63.0	.6586	.6074	565.2	25.5
30.89	.7641	.6586	105.5	4.76
27.01	1.0170	.7641	252.9	11.41
18.73	1.1992	1.0170	182.2	8.22
12.7	1.3471	1.1992	147.9	6.67
6.8	1.4492	1.3471	102.1	4.61
3.84	1.4822	1.4492	31.6	1.43
2.48	1.4937	1.4822	12.9	.58
Total			2215.8	
			Milligrms	

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-4
DATE JULY 11-12, 1928
PROJECT NO. G.S.A.
BOILER NO. 4
DURATION OF TEST _____

FACTORS
INTEGRATOR x 1.50
CHART x 1.222
(FACTOR AT 175 PSIG)
CORRECTION FACTOR @ 135 PSIG
= 0.89

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART FLOW INTAKE	SUPER HEAT TEMP. AIR FLOW	FEED WATER TEMP. @ ECON. LEVEL IN	FLUE GAS TEMP. @ ECON. OUT	COMB. AIR TEMP.	GATE HT. M-M	PRESSURES		F. W. PRESS.	WIND BOX +	ZONE 1 +	ZONE 2 +	ZONE 3 +	ZONE 4	ZONE 5	FURN. -	DUST COLL. IN	DUST COLL. OUT	OVIA FURN. AIR			REMARKS			
								DRUM	HPR.											STACK DEN. R.	CO ₂	O ₂		CO		
	JULY 11, 1928		STAGY TRAVEL				PARTICULATE			SILE TEST																
AM 0700		12.8	33422.5	10.2	70.5	-	465	70	5 1/2	-	-	265	0.9	0.3	-	-	-	0.18	0.2	0.8	2.4	-	-	-	0830 FULL ASHES, DOWN TUBES PRIOR TO THE VINT START TO CHANGING TO CONSOLIDATION COAL	
0830		9.0	33485.5	-	-0.5	208	440	70	5 1/2	135	132	260	0.2	0.0	-	-	-	0.12	0.3	0.8	2.5	-	-	-	0928	
1000		20.0	33508.0	18.0	+1.5	210	538	71	5 3/4	135	128	265	0.5	-	-	-	-	0.17	0.5	1.8	2.5	-	-	-	0930	
1030		21.0	33535.8	15.8	0	212	540	70	6	138	130	252	0.9	-	-	-	-	0.14	0.5	1.9	2.5	8.0	11.5	0	1045 START TRAVEL	
1100		22.5	33564.5	14.6	0	212	548	71	6 1/8	135	130	252	0.6	-	-	-	-	0.15	0.5	1.9	2.5	9.3	10.0	0		
1130		22.0	33591.2	14.0	0	213	530	71	6 1/8	135	128	252	0.7	0.1	-	0.15	-	0.05	0.4	1.6	2.5	10.5	8.7	0		
1200		21.8	33622.5	11.5	0	212	535	72	6 1/8	135	128	252	0.6	0.1	-	0.05	-	0.10	0.4	1.4	2.6	11.4	7.9	0		
PM 1230		21.5	33651.5	10.0	+0.5	213	522	73	6 1/8	135	128	255	0.6	0.1	-	0.05	-	-	0.5	1.7	2.6	11.9	7.0	0		
1300		22.0	33680.7	12.5	+0.5	213	540	74	6 1/8	138	130	250	0.7	-	0.4	-	-	0.09	0.4	1.7	2.8	12.2	6.5	0		
1330		19.6	33710.5	7.5	-0.5	213	540	74	6 1/8	138	130	250	0.4	-	0.4	-	-	0.05	0.3	1.2	2.6	11.8	7.1	0		
1400		20.5	33737.5	10.6	0	213	530	74	6 1/8	135	128	255	0.4	-	0.3	-	-	0.08	0.3	1.2	1.6	11.3	7.7	0		
1430		21.0	33765.5	16.0	0	213	535	74	6 1/8	135	130	250	0.5	-	0.3	-	-	0.15	0.4	1.4	1.5	10.8	8.3	0		
1500		21.0	33791.5	14.7	+0.5	213	535	75	6 1/8	138	132	252	0.7	-	0.5	-	-	0.14	0.4	1.6	1.5	11.0	7.8	0		
1530		21.8	33822.5	15.2	0	213	480	75	6 1/8	138	130	252	0.7	-	0.4	-	-	0.10	0.4	1.6	1.6	11.0	7.8	0		
1545		21.0	33834.5	15.0	0	213	545	75	6 1/8	135	128	252	0.8	-	0.5	-	-	0.08	0.4	1.8	1.6	10.1	8.5	0	END TESTS BLANK READ	
Ave					213		73			136	129	259									10.7	8.2	0			
A NOTE: FLUE GAS TEMP AT BOILER OUTLET AND PORT LOCATION IN DRESSING INDICATOR THERE MAY BE AIR INFLUENCE BETWEEN THESE TWO POINTS																										

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-4
DATE JULY 11-12, 1978
PROJECT NO. 0-3A
BOILER NO. 4
DURATION OF TEST _____

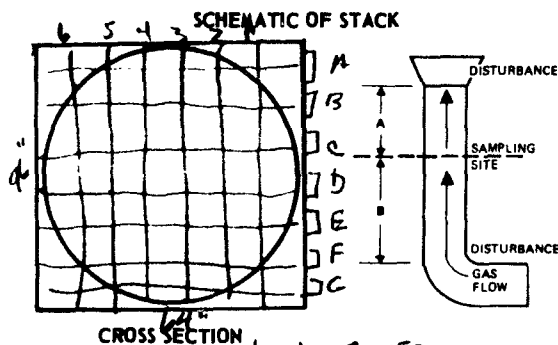
FACTORS
INTEGRATOR X 0.50
CHART X 1000
(FACTOR AT 175 PSIG)
CORRECTION FACTOR @ 196 PSIG
= 0.92

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART FLOW INTG.	SUPER HEAT TEMP. AIRFLOW	FEED WATER TEMP. @ ECON. LEVEL IN	ECON. TEMP. OUT	FLUE GAS TEMP. ECON. OUT	COMB. AIR TEMP.	DATE HR	PRESSURES		F. W. PRESS.	WIND BOX +	ZONE 1 +	ZONE 2 +	ZONE 3 +	ZONE 4	ZONE 5	FURN. -	DUST COLL. IN	DUST COLL. OUT	OVER FURN. STACK DEN. R.	CO ₂	O ₂	CO	REMARKS	
									DRUM	HPR.																
	JULY	12, 1978	PARTICULATE EMISSION		PARTICULATE SIZE TESTS																				0600 AM PRESS. ALARM	
AM 0730		23.0	34109.0	16.0	+1.0	213	550	64	6	148	143	250	0.7	0.1	0.4	-	-	-	0.16	0.4	2.0	2.8	12.2	6.9	0	0748 - COLLATERAL NOISE
0800	1470	22.5	34138.5	15.2	0	213	550	65	6	145	140	250	0.6	0.1	0.4	-	-	-	0.16	0.5	2.0	2.8	12.2	7.0	0	CEANER.
0830		23.7	34169.0	16.0	0	213	550	66	6	145	142	250	0.8	0.1	0.4	-	-	-	0.15	0.5	2.1	2.8	12.0	6.8	0	0800 LEAKAGE COAL HOPPER
0900		23.0	34200.5	15.5	-0.5	213	550	67	6	148	145	250	0.7	0.1	0.4	-	-	-	0.22	0.5	2.0	2.7	11.0	7.8	0	
0930	1480	20.4	34228.5	12.7	+0.5	213	550	69	6	148	143	250	0.4	0.1	0.5	-	-	-	0.27	0.6	1.9	2.7	9.2	9.6	0	
1000	1411	21.0	34256.0	15.6	+0.5	213	550	70	6	148	142	250	0.8	0.1	0.5	-	-	-	0.18	0.6	2.1	2.7	10.9	8.8	0	
1030	1454	21.5	34284.0	15.7	+0.5	213	550	72	6	148	142	250	0.6	0.1	0.35	-	-	-	0.25	0.6	2.1	2.7	9.8	9.0	0	
1100		22.0	34312.5	15.9	0	213	550	73	6	148	142	250	0.8	0.15	0.5	-	-	-	0.18	0.6	2.4	2.7	10.2	8.9	0	
1130	1476	21.5	34342.0	15.2	0	213	550	74	6	148	140	250	0.8	0.1	0.45	-	-	-	0.20	0.6	2.2	2.7	10.6	8.6	0	
1200	1481	22.0	34371.5	15.2	0	213	550	74	6	148	141	250	0.8	0.15	0.5	-	-	-	0.18	0.6	2.5	2.7	10.4	8.8	0	1239 LEAKAGE COAL HOPPER
1230	1007	22.0	34401.5	16.0	0	213	550	75	6	148	141	250	0.6	0.1	0.4	-	-	-	0.25	0.6	2.4	2.7	10.2	9.0	0	1200 REMOVED EX. AIR FROM HOPPER
1300	1011	22.1	34431.0			211		76		141	142	250										10.2	9.1	0	1210 LEAKAGE COAL HOPPER	
PM 1300		22.0	34461.0	16.0	0	213	555	75	6	148	142	250	0.7	0.1	0.4				0.24	0.6	2.4	2.7	9.8	9.4	0	
1330		19.2	34491.5	12.0	0	213	550	75	6	148	141	250	0.6	0.1	0.4				0.19	0.6	2.0	2.7	10.2	8.6	0	
1400		20.0	34521.5	12.3	0	213	550	77	6	148	142	250	0.6	0.1	0.4				0.20	0.6	2.0	2.7	10.0	9.2	0	
1430		20.0	34551.0	14.5	0	213	550	77	6	147	142	250	0.6	0.1	0.35				0.25	0.6	2.0	2.7	10.6	8.6	0	
1500		20.4	34580.0	14.8	0	213	550	77	6	148	142	250	0.6	0.1	0.35				0.20	0.6	2.0	2.7	10.6	8.6	0	
1530		21.3	34610.0	15.9	0	213	550	77	6	147	141	250	0.7	0.1	0.4				0.25	0.6	2.3	2.7	9.6	9.6	0	END TESTING - REVERSE LOAD.
Avg						213		76		148	142	250										10.1	9.0	0		

SECTION 5.0

SITE L5 DATA

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PARTICULATE FIELD DATA

PLANT L-5
DATE 11/16/78
LOCATION Breeding
OPERATOR Davis Anderson
STACK NO. Boiler #1
RUN NO. Certification Test
SAMPLE BOX NO. RAC
METER BOX NO. RAC

AMBIENT TEMPERATURE 40
BAROMETRIC PRESSURE 28.10
ASSUMED MOISTURE, % 5
PROBE LENGTH, in. 60
NOZZLE DIAMETER, in. 3/4
STACK DIAMETER, in. 14" x 96"
PROBE HEATER SETTING Full
HEATER BOX SETTING 250°F

Start Leak test = 0.015 @ 15" Hg 1/4

METER ΔH_0 1.74
C FACTOR 0.0092
PROCESS WEIGHT RATE

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{AP_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER (°F)		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{min}), °F	OUTLET (T _{out}), °F				
A	1	5	-62	411	.004	1.0	1.0	918.00	83	184	46	0.0	
	2	5	"	435	.005	1.0	1.0	-	89	209	44	1.0	
	3	5	"	460	.006	1.2	1.2	924	94	221	46	2.5	
	4	5	"	464	.007	1.4	1.4	927	97	226	46	3.0	
	5	5	"	458	.007	1.4	1.4	930	99	241	46	3.0	
	6	5	"	446	.004	.8	.8	-	100	246	44	2.0	
				2673	.4494	6.8		562		1727	272	12.5	
B	1	5	"	385	.005	1.0	1.0	936.41	97	226	44	2.5	
	2	5	"	404	.006	1.2	1.2	-	95	229	44	3.5	
	3	5	"	401	.007	1.4	1.4	-	103	231	45	4.5	
	4	5	"	400	.008	1.0	1.0	946	104	237	45	4.0	
	5	5	"	410	.007	1.4	1.4	-	102	238	44	5.0	
	6	5	"	422	.006	1.2	1.2	952	106	242	44	5.0	
				2422	.4637	7.2		613		1403	221	24.5	
C	1	5	"	380	.004	0.8	0.8	953.46	100	220	44	3.8	
TOTAL	65	-	5475		.9763	14.8		1275		1950	537	40.8	

AVERAGE -62

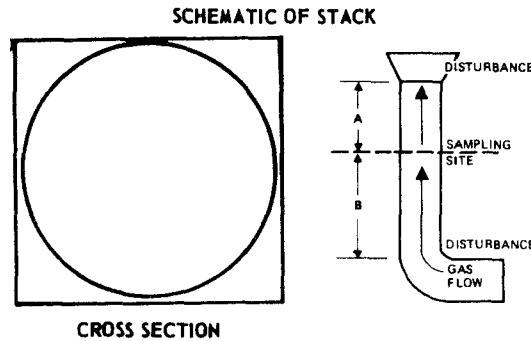
VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL					
INITIAL	100	100			200
LIQUID COLLECTED					
TOTAL VOLUME COLLECTED					

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1				0	
2				0	
3				0	
4				0	

COMMENTS:

PARTICULATE FIELD DATA

2/4



PLANT L-5
 DATE 16/16/78
 LOCATION Breachin
 OPERATOR Davis Anderson
 STACK NO. Boiler #1
 RUN NO. Certification
 SAMPLE BOX NO. RAC
 METER BOX NO. RAC
 AMBIENT TEMPERATURE 40
 BAROMETRIC PRESSURE 28.1
 ASSUMED MOISTURE, % 5
 PROBE LENGTH, in. 60"
 NOZZLE DIAMETER, in. 3/4"
 STACK DIAMETER, in. 64" x 96"
 PROBE HEATER SETTING 250
 HEATER BOX SETTING Full

METER ΔH_g 1.74
 C FACTOR 0.0092
 PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
C	2	5	-1.62	390	.006	1.2	1.2	—	103	234	42	6.0	
	3	5	-1.62	380	.005	1.0	1.0	—	105	238	42	6.0	
	4	5	"	404	.005	1.0	1.0	—	106	241	40	6.0	
	5	5	"	398	.005	1.0	1.0	—	107	240	42	7.0	
	6	5	"	409	.006	1.2	1.2	—	107	238	43	8.0	
			1981		.3671	54		528		1191	209	33	
D	1	5	"	388	.002	0.4	0.4	973.45	98	220	42	3.8	
	2	5	"	380	.003	0.6	0.6	—	100	226	46	5.0	
	3	5	"	379	.003	0.6	0.6	—	102	228	47	5.2	
	4	5	"	399	.003	0.6	0.6	—	103	226	48	5.3	
	5	5	"	414	.003	0.6	0.6	—	104	229	46	5.5	
E-J 11306	5	"	"	418	.004	0.8	0.8	984.7	104	229	44	7.0	
Stack 1200			2368		.3671	36		987.38	69.38	1358	273	31.8	
E	1	5	"	350	.002	0.4	0.4	988.50	98	200	44	2.0	
R	5	"	"	350	.002	0.4	0.4	—	100	220	44	2.0	
TOTAL	130		-1.62	10524		1.2599	24.4		2612	5919	1107	109.6	
AVERAGE			-1.62										

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL					
INITIAL					
LIQUID COLLECTED					
TOTAL VOLUME COLLECTED					

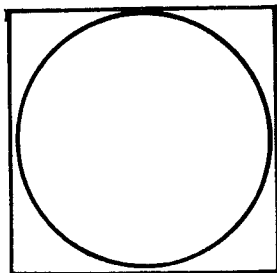
ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2					
3					
4					

COMMENTS:

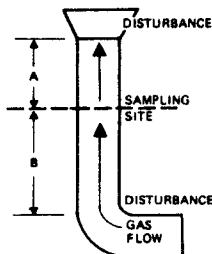
After D6 Filter changed
 End Leak Test after D6 = 0.02 cfm
 15" Stack " " For Filter #2 = 0.013 "

PARTICULATE FIELD DATA

SCHEMATIC OF STACK



CROSS SECTION



PLANT L-5
 DATE 11/16/78
 LOCATION Breaching
 OPERATOR Anderson-Davis
 STACK NO. Boiler #1
 RUN NO. Certification
 SAMPLE BOX NO. RAC
 METER BOX NO. RAC

AMBIENT TEMPERATURE 40
 BAROMETRIC PRESSURE 2
 ASSUMED MOISTURE, % 5
 PROBE LENGTH, in. 60"
 NOZZLE DIAMETER, in. 3/4
 STACK DIAMETER, in. 64 X 96
 PROBE HEATER SETTING 250
 HEATER BOX SETTING Full

METER ΔH_g 1.74
 C FACTOR 0.0092

PROCESS WEIGHT RATE

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
E 3	5	-.62	346	.002	0.4	0.4	992.0	102		220	42	2.2	
4	5	"	346	.002	0.4	0.4	—	103		228	43	2.3	
5	5	"	364	.001	0.2	0.2	—	103		237	44	2.0	
6	5	"	404	.002	0.4	0.4	999.60	103		244	44	2.3	
			1406	.1658	1.4		11.1	411		929	173	8.8	
F 1	5	"	330	.001	0.2	0.2	1002.0	101		238	44	2.0	
2	5	"	330	.001	0.2	0.2	1003.65	102		248	44	2.0	
3	5	"	333	.001	0.2	0.2	—	102		252	44	2.0	
4	5	"	347	.001	0.2	0.2	6.55	101		254	44	2.0	
5	5	"	387	.001	0.2	0.2	8.20	101		251	44	2.0	
6	5	"	403	.002	0.4	0.4	—	101		255	44	2.4	
			2126	.2028	1.4			608		1498	264	12.4	
G 1	5	"	310	.001	0.2	0.2	1011.29	99		233	45	2.0	
2	5	"	310	.001	0.2	0.2	12.9	100		251	45	2.0	
3	5	"	295	.001	0.2	0.2	14.2	100		249	45	2.0	
TOTAL	195		14965		2.2234	28		3930		9079	1679	136.8	

AVERAGE -.62

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g	ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
	1	2	3	4							
FINAL											
INITIAL											
LIQUID COLLECTED											
TOTAL VOLUME COLLECTED											

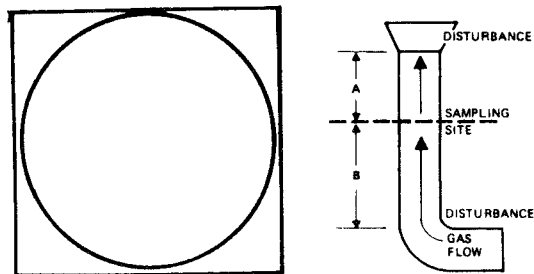
COMMENTS:

A ΔP_s reading at 0.001 is a slight positive reading on magnahelic (0-.25")

PARTICULATE FIELD DATA

End Leak Test .0.013 @ 15" ⁴/₄

SCHEMATIC OF STACK



CROSS SECTION

PLANT L-5 AMBIENT TEMPERATURE 40 METER ΔH_0 1.74
 DATE 11/16/78 BAROMETRIC PRESSURE 30 C FACTOR 1.0092
 LOCATION Breaching ASSUMED MOISTURE, % 5 PROCESS WEIGHT RATE _____
 OPERATOR Davis Anderson PROBE LENGTH, in. 60"
 STACK NO. Boiler #1 NOZZLE DIAMETER, in. 3/4"
 RUN NO. Certification Test STACK DIAMETER, in. 64 x 96
 SAMPLE BOX NO. RAC PROBE HEATER SETTING Full
 METER BOX NO. RAC HEATER BOX SETTING 250°F

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY f/s
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
G	4	5	- .62	293	.001		0.2	0.2	15.7	100	242	45	2.2
	5	5	"	313	.001		0.2	0.2	—	101	243	45	2.2
	6	5	"	297	.001		0.2	0.2	18.7	101	245	45	2.2
				903		.0949	.6		302	730	135	6.6	
H	1	5	"	274	.001		0.2	0.2	18.94	98	234	46	2.3
	2	5	"	269	.001		0.2	0.2	21.4	99	241	46	2.3
	3	5	"	264	.001		0.2	0.2	—	100	237	47	2.3
	4	5	"	310	.001		0.2	0.2	24.3	100	233	46	2.3
	5	5	"	260	.001		0.2	0.2	—	100	230	46	2.3
	6	5	"	288	.001		0.2	0.2	—	100	234	46	2.3
							1.2		1028.735	599			
									26.735				
TOTAL	240		17533		2.5089	24.8	107.215	4829		11226	2091	157.2	
AVERAGE		- .62	365		0.05225	.621		101		234	44	3.3	

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL	165	115	1		218
INITIAL	100	100	0		200
LIQUID COLLECTED	65	15	1		18
TOTAL VOLUME COLLECTED					99

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2					
3					
4					

COMMENTS:

PARTICULATE LAB WORKSHEET

Site Desig. 1

Date Nov 11, 78

Sample Loc. _____

	beaker #	final wt (gm)	initial wt (gm)	Δ wt (gm)
Impinger catch and H ₂ O rinse after filter (water sol. only)	<u>A 1</u> <u>A 2</u>	<u>91.2219</u> <u>91.5741</u>	<u>95.3834</u> <u>94.3415</u>	<u>.0060</u> <u>.0026</u>
H ₂ O rinse before filter (water sol. only)	<u>A 3</u>	<u>92.2311</u>	<u>92.1945</u>	<u>.0426</u>
Acetone rinse after filter	<u>A 5</u>	<u>36.10511</u>	<u>36.0872</u>	<u>.01591</u>
Acetone rinse before filter	<u>A 4</u>	<u>36.36638</u>	<u>36.2961</u>	<u>.07026</u>
	Filter #			
Impinger catch and H ₂ O rinse after filter (water insol. only)	<u>55-.8</u> <u>60-.45</u> <u>65-.22</u>	<u>.08511</u> <u>.09323</u> <u>.10876</u>	<u>.08506</u> <u>.09223</u> <u>.10876</u>	<u>.0045</u> <u>0</u> <u>0</u>
H ₂ O rinse before filter (water insol. only)	<u>54-.8</u> <u>59-.45</u> <u>66-.22</u>	<u>.21154</u> <u>.09219</u> <u>.10876</u>	<u>.01505</u> <u>.09319</u> <u>.10912</u>	<u>.13679</u> <u>0</u> <u>0</u>
Test Filter	<u>C 117</u> <u>C 116</u>	<u>1.19219</u> <u>.78488</u>	<u>.67590</u> <u>.67094</u>	<u>.51629</u> <u>.11394</u>
TOTAL MASS				<u>.90609</u>

Dry Gas Meter Vol. (ft ³)	Imp. Water Vol. (Ml.)			
Final <u>025.215</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Initial <u>918.00</u>	<u>165</u>	<u>115</u>	<u>1</u>	<u>218</u>
Δ DgV <u>107.215</u>	<u>100</u>	<u>100</u>	<u>0</u>	<u>200</u>
	<u>65</u>	<u>15</u>	<u>1</u>	<u>18</u>
	Total H ₂ O			<u>99</u>

IMPACTOR DATA SHEET

Site Desig. LS

Date Nov 15, 78

Sample Location _____

Sample No. _____

P_b 28.0

Assmd Moisture 3%

Noz. Dia. 3/4"

Stk. Dia 64-96

Sample Point _____

Sample Time 45 MIN

Stat P -.62"H₂O

Pitot Tube ΔP .008"H₂O

Stk T 372°F

ΔH Orifice 1.4"H₂O

Liquid Col. 16 ml

Sample Vol. 27.31 scf

D _p	Net Wt. (milligm)	Percent
<u>125</u>	<u>47.25</u>	<u>26.29</u>
<u>60</u>	<u>11.54</u>	<u>6.42</u>
<u>45</u>	<u>6.74</u>	<u>3.75</u>
<u>30.0</u>	<u>5.94</u>	<u>3.31</u>
<u>17.31</u>	<u>14.15</u>	<u>7.87</u>
<u>11.35</u>	<u>12.5</u>	<u>6.96</u>
<u>7.04</u>	<u>12.99</u>	<u>7.23</u>
<u>4.75</u>	<u>4.9</u>	<u>2.73</u>
<u>3.21</u>	<u>4.17</u>	<u>2.67</u>
<u>2.04</u>	<u>2.28</u>	<u>2.99</u>
<u>.98</u>	<u>6.13</u>	<u>3.75</u>
<u>.57</u>	<u>12.16</u>	<u>7.32</u>
<u>.36</u>	<u>33.66</u>	<u>18.73</u>
Total	<u>179.73</u> Milligrms	

BAHCO SIZE DATA SHEET

Site Desig. L 5

Date Nov 15, 78

Sample Location _____

Sample No. _____

P_b 28.0" Ag

Assmd Moisture 5

Noz. Dia. 3/4

Stk. Dia 64"-96"

Sample Point _____

Sample Time 11/14 M.N

Stat P -.62 "H₂O

Pitot Tube ΔP .0047 "H₂O

Stk T 369 °F

ΔH Orifice .977 "H₂O

Liquid Col. 35 ml

Sample Vol. 70.69 scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligm)	Percent
<u>125</u>			<u>411.61</u>	<u>54.67</u>
<u>60</u>			<u>109.44</u>	<u>14.32</u>
<u>45</u>			<u>30.2</u>	<u>3.95</u>
<u>34.53</u>			<u>16.1</u>	<u>2.11</u>
<u>27.01</u>			<u>31.2</u>	<u>4.08</u>
<u>18.73</u>			<u>32.7</u>	<u>5.07</u>
<u>12.7</u>			<u>37.7</u>	<u>4.93</u>
<u>6.2</u>			<u>30.5</u>	<u>3.99</u>
<u>3.48</u>			<u>39</u>	<u>5.51</u>
<u>2.48</u>			<u>48.6</u>	<u>6.36</u>
Total			<u>764.01</u>	
			Milligrms	

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-5
DATE Nov. 15, 1978
PROJECT NO. G.S.A.
BOILER NO. 1
DURATION OF TEST _____

FACTORS
INTEGRATOR x 400
CHART x 1000

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART	SUPER HEAT TEMP.	FEED WATER TEMP. @ BOON	FLUE GAS TEMP. @ BOON	COMB. AIR TEMP.	SAT. STM. COND. MM	PRESSURES	F. W. PRESS.	WIND BOX	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	FURN.	DUST COLL. IN	DUST COLL. OUT	CO ₂	O ₂	CO	REMARKS		
		Flow Integ	Air/Furn	IN	OUT	TEMP. BOON		DRUM	HPR.															
		STAGN	TRANS	PARTICULATE	SIZE TEST																			
AM 11:30	-	23.5	36696	16.5	232	-	510	74	-	150	148	185	2.0	0.6	-	-	0.10	0.25	-	14.0	9.2	10.2	0	8 AM - PHILASHES
12:00	-	28.0	36721	27.0	233	-	540	75	-	150	148	180	1.9	1.1	-	-	0.10	0.35	-	11.5	9.7	9.5	0	ALON TUBES
PM 12:30	-	41.0	36742	22.0	233	-	520	76	-	150	148	177	5.0	4.3	-	-	0.0	0.57	-	9.5	6.7	12.8	0	11:00 - INC. LOAD
1:00	-	22.0	36783	23.0	233	-	540	76	-	160	148	182	2.2	0.4	-	-	0.25	0.37	-	10.5	9.0	10.4	0	CONTROL - AIR AUTO
1:30	-	18.0	36811	23.0	232	-	495	76	-	150	149	185	1.3	1.3	-	-	0.14	0.30	-	14.5	10.6	9.8	0	FUEL MANUAL
2:00	-	23.6	36835	29.5	233	-	530	76	-	150	149	185	3.0	2.6	-	-	0.08	0.50	-	9.7	8.9	10.5	0	1:15 LEVELED FUEL AIR
2:30	-	26.5	36864	27.0	230	-	530	76	-	150	148	182	3.0	1.9	-	-	0.33	0.45	-	10.2	8.8	10.7	0	2:00 CONTROL - FUEL AUTO
3:00	-	22.5	36890	20.5	230	-	515	76	-	150	148	182	2.6	1.9	-	-	0.21	0.40	-	12.0	8.7	10.5	0	3:00 DROPPER AIR - LEVELING
3:30	-	23.0	36920	17.0	230	-	500	75	-	150	148	182	1.7	1.6	-	-	0.15	0.30	-	18.9	10.5	9.0	0	FUEL REG.
4:00	-	21.0	36948	18.0	230	-	510	75	-	150	148	185	2.6	2.8	-	-	0.25	0.45	-	82.0	8.3	11.2	0	5:00 DRS. LOAD
4:30	-	22.0	36975	15.0	230	-	530	75	-	150	148	182	2.8	2.0	-	-	0.25	0.42	-	9.0	8.5	10.9	0	
5:00	-	16.5	37003	16.5	230	-	460	75	-	150	148	182	0	0	-	-	0.45	0.53	-	9.2	9.2	10.1	0	STACK NO. 1, OR 20%
																							REMARKS, EXCEPT 15	
																							OR 30% WHEN CLEANING	
AVG.	-	-	-	-	231	-	-	75	-	150	148	182	-	-			-	-	11.5	9.0	10.4	0	FIRE.	
			</																					

DATA SHEET

BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site 1-5 _____
DATE Nov 16, 1928 _____
PROJECT NO. G.S.A. _____
BOILER NO. 1 _____
DURATION OF TEST _____

FACTORS

INTEGRATOR x 400
CHART x 1000

[illegible]

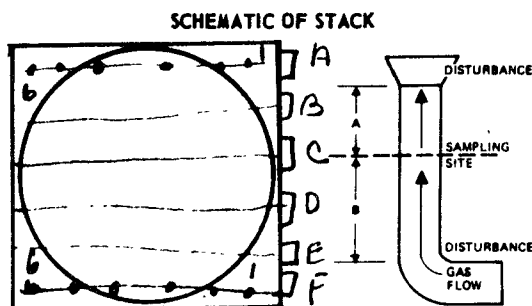
SECTION 6.0

SITE L6 DATA

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PARTICULATE FIELD DATA SHEETS	54
PARTICULATE LAB WORKSHEET	57
IMPACTOR DATA SHEETS	58
BAHCO SIZE DATA SHEETS	59
BOILER SYSTEM TEST DATA SHEETS	60

PARTICULATE FIELD DATA

Start Leak Test = .007 ct in 1/3
15" Hg



CROSS SECTION
Start 1025

PLANT L-6
DATE 12/6/78
LOCATION Breaching
OPERATOR Davis - Anderson
STACK NO. Boiler No 1
RUN NO. Certification
SAMPLE BOX NO. RAC
METER BOX NO. RAC

AMBIENT TEMPERATURE 72
BAROMETRIC PRESSURE 28.42
ASSUMED MOISTURE, % 5%
PROBE LENGTH, in. 120"
NOZZLE DIAMETER, in. 3/4"
STACK DIAMETER, in. 11' X 6'
PROBE HEATER SETTING EXH
HEATER BOX SETTING 250°

METER ΔH_g 1.74
C FACTOR .0078 - .0085

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	#1 STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP _s) (√ΔP _s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	#2 GAS SAMPLE TEMPERATURE AT DRY GAS METER		#3 SAMPLE BOX TEMPERATURE °F	#4 TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
A-6	5 min	- .48	443	.018	3.4	3.4	157.22	76		206	69	3	
5	"	"	450	.02	3.7	3.7	-	82		208	70	4	
4	"	"	453	.02	3.7	3.7	-	87		228	70	4.5	
3	"	"	450	.021	3.9	3.9	172.8	95		247	70	5.0	
2	"	"	449	.02	3.7	3.7	-	98		246	70	4.5	
1	"	"	430	.015	2.9	2.9	184.00	101		247	70	3.0	
			2675	.7258		21.3			539		1382	419	24
B-6	5 min	- .48	420	.018	3.5	3.5	188.94	92		215	71	4.0	
5	"	"	433	.018	3.5	3.5	194.3	98		229	63	4.0	
4	"	"	427	.017	3.3	3.3	199.6	102		239	62	3.5	
3	"	"	420	.015	3.0	3.0	204.7	105		248	60	3.0	
2	"	"	400	.011	2.2	2.2	209.7	106		248	61	2.5	
1	"	"	370	.007	1.5	1.5	214.0	106		245	61	2.0	
			2470	.7097		17	217.73		609		1424	378	19
TOTAL	60		3145		1.5358	38.3	60.51		1148		2806	797	43

AVERAGE - .48

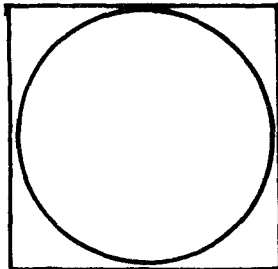
VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g	ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
	1	2	3	4							
FINAL	107.5	113			226.9	1					
INITIAL	100	100	0	-	2.00	2					
LIQUID COLLECTED	7.5	13	5		26.9	3					
TOTAL VOLUME COLLECTED						4					

COMMENTS:

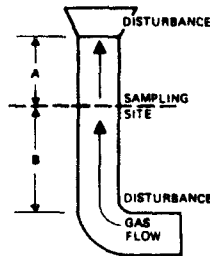
26.9
107.5
100
7.5
52.4

PARTICULATE FIELD DATA

SCHEMATIC OF STACK



CROSS SECTION



PLANT L-6 AMBIENT TEMPERATURE 75
 DATE 2/6/78 BAROMETRIC PRESSURE 28.46
 LOCATION Breeding ASSUMED MOISTURE, % 570
 OPERATOR And SD PROBE LENGTH, in. 120
 STACK NO. Boiler #1 NOZZLE DIAMETER, in. 3/4
 RUN NO. Centrifugal STACK DIAMETER, in. 11' x 6'
 SAMPLE BOX NO. RAC PROBE HEATER SETTING Full
 METER BOX NO. RAC HEATER BOX SETTING 250

METER ΔH_0 1.74
 C FACTOR .0078-.0085

PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m1}), °F	OUTLET (T _{m2}), °F				
C 6	5 min	-.48	250	.002	.50	.50	217.73	97		214	67	0.0	
5	"	"	262	.003	.71	.71	219.90	97		225	59	0.5	
4	"	"	255	.002	.50	.50	222.4	98		224	58	0.0	
3	"	"	235	.002	.50	.50	224.5	100		239	60	0.0	
2	"	"	230	.002	.50	.50	226.65	100		244	62	0.0	
1	"	"	220	.001	.26	.26	228.75	101		260	62	0.0	
			1452		.253	2.97			593	1409	368	.5	
D 6	5 min	-.48	170	.001	.28	.28	230.42	94		252	72	0.0	
5	"	"	176	.001	.28	.28	232.00	95		280	69	0	
4	"	"	180	.001	.28	.28	233.6	96		270	66	0	
3	"	"	178	.001	.28	.28	235.2	97		257	64	0	
2	"	"	182	.001	.28	.28	236.8	98		253	63	0	
1	"	"	160	.001	.28	.28	238.4	100		246	62	0	
			1046		.1997	1.68	240.10		580	1558	396	0	
			2498		.4550	4.65	22.37		1173	2967	764	.5	
TOTAL	120 min		7643		1.9909	42.95	82.88		2321	5773	1561	43.5	

AVERAGE

-.48

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL					
INITIAL					
LIQUID COLLECTED					
TOTAL VOLUME COLLECTED					

ORSAT MEASUREMENT

TIME	CO ₂	O ₂	CO	N ₂
1				
2				
3				
4				

COMMENTS:

Effective Stack Dimensions
10' x 6'

© 1973

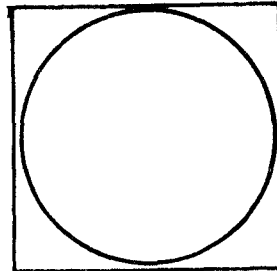
CHICAGO SCIENTIFIC INC
 (312) 786-2000

PARTICULATE FIELD DATA

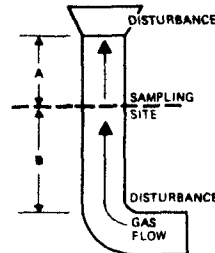
Stop-Leak Test = .008 CFM
@ 15" Hg

3/3

SCHEMATIC OF STACK



CROSS SECTION



PLANT L-6
DATE 32/6/78
LOCATION Breaching
OPERATOR Duoic - And
STACK NO. Bailon #1
RUN NO. Certification
SAMPLE BOX NO. RAC
METER BOX NO. RAC

AMBIENT TEMPERATURE 72
BAROMETRIC PRESSURE 28.46
ASSUMED MOISTURE, % 5
PROBE LENGTH, in. 120"
NOZZLE DIAMETER, in. 3/4"
STACK DIAMETER, in. —
PROBE HEATER SETTING Full
HEATER BOX SETTING 250

METER ΔH_g 1.74
C FACTOR —
PROCESS WEIGHT RATE —

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP _s) (√ΔP _s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
E 6	6 min	-.48	158	.001	.28	.28	240.10	96		227	72	0.0	
5	"	"	167	.001	.28	.28	241.70	96		246	69	0.0	
4	"	"	160	.001	.28	.28	243.3	97		242	68	0.0	
3	"	"	154	.001	.28	.28	245.0	98		245	67	0.0	
2	"	"	150	.001	.28	.28	246.6	99		246	66	0.0	
1	"	"	148	.001	.28	.28	248.2	99		246	67	0.0	
			937		.1897		249.92		583	1453	409	0.0	
			7643		.19905		9.82		2321	5773	1561	43.5	
							82.88						
TOTAL	150		8580		2.1802		92.70		2906	7226	1970	43.5	
AVERAGE		-.48	286		.0727		1.49		97	241	66	1.45	

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL					
INITIAL					
LIQUID COLLECTED					
TOTAL VOLUME COLLECTED					

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2					
3					
4					

COMMENTS:

orsat
1380 Port B

PARTICULATE LAB WORKSHEET

Site Desig. L 6

Date Dec 6, 78

Sample Loc. _____

	beaker #	final wt (gm)	initial wt (gm)	Δ wt (gm)
Impinger catch and H ₂ O rinse after filter (water sol. only)	<u>J 1</u> <u>J 2</u>	<u>90.2246</u> <u>96.5622</u>	<u>90.2094</u> <u>96.5571</u>	<u>.0152</u> <u>.0051</u>
H ₂ O rinse before filter (water sol. only)	<u>J 3</u>	<u>99.2833</u>	<u>99.2084</u>	<u>.0749</u>
Acetone rinse after filter	<u>J 4</u>	<u>91.6713</u>	<u>91.6619</u>	<u>.0094</u>
Acetone rinse before filter	<u>J 5</u>	<u>91.6932</u>	<u>91.6320</u>	<u>.0612</u>
	Filter #			
Impinger catch and H ₂ O rinse after filter (water insol. only)	<u>52-.8</u> <u>57-.45</u> <u>68-.22</u>	<u>.07565</u> <u>.09380</u> <u>.10730</u>	<u>.07565</u> <u>.09380</u> <u>.10730</u>	<u>0</u> <u>0</u> <u>0</u>
H ₂ O rinse before filter (water insol. only)	<u>52-.8</u> <u>58-.45</u> <u>67-.22</u>	<u>.13120</u> <u>.09285</u> <u>.10900</u>	<u>.07685</u> <u>.09285</u> <u>.10900</u>	<u>.05435</u> <u>0</u> <u>0</u>
Test Filter	<u>118</u>	<u>0.9221</u>	<u>0.68820</u>	<u>.23371</u>
TOTAL MASS				<u>.45459</u>

Dry Gas Meter Vol. (ft³)
 Final 249.92
 Initial 157.22
 Δ DgV 92.7

Imp. Water Vol. (Ml.)	1	2	3	4
	<u>151.5</u>	<u>113</u>	<u>5</u>	<u>226.9</u>
	<u>100</u>	<u>100</u>	<u>0</u>	<u>200</u>
	<u>7.5</u>	<u>13</u>	<u>5</u>	<u>26.9</u>
Total H ₂ O				<u>52.4</u>

IMPACTOR DATA SHEET

Site Desig. L6

Date Dec 5, 78

Sample Location _____

Sample No. _____

P_b 28.16

Assmd Moisture 37%

Noz. Dia. 3/4"

Stk. Dia 120" - 72"

Sample Point _____

Sample Time 30 min

Stat P -.45"H₂O

Pitot Tube ΔP .007"H₂O

Stk T 281 °F

ΔH Orifice 1.78"H₂O

Liquid Col. 12.37 ml

Sample Vol. 20.55 scf

	Net Wt. (milligm)	Percent
<u>125</u> ^{D_p}	<u>2.5</u>	<u>5.47</u>
<u>60</u>	<u>.83</u>	<u>1.52</u>
<u>45</u>	<u>.45</u>	<u>.98</u>
<u>30</u>	<u>0</u>	<u>0</u>
<u>16.74</u>	<u>7.06</u>	<u>15.45</u>
<u>10.98</u>	<u>3.11</u>	<u>6.80</u>
<u>6.82</u>	<u>2.25</u>	<u>4.92</u>
<u>4.60</u>	<u>1.48</u>	<u>3.24</u>
<u>3.12</u>	<u>2.13</u>	<u>4.66</u>
<u>1.98</u>	<u>2.17</u>	<u>4.75</u>
<u>.96</u>	<u>2.02</u>	<u>4.42</u>
<u>.57</u>	<u>10.53</u>	<u>22.04</u>
<u>.35</u>	<u>11.18</u>	<u>24.46</u>
Total	<u>45.71</u>	
	Milligrams	

BAHCO SIZE DATA SHEET

Site Desig. L 6

Date Dec 5, 78

Sample Location _____

Sample No. _____

P_b 28.46"Hg

Assmd Moisture 5%

Noz. Dia. 3/4

Stk. Dia 10'-6'

Sample Point _____

Sample Time _____

Stat P -1.48"H₂O

Pitot Tube ΔP _____"H₂O

Stk T _____°F

ΔH Orifice _____"H₂O

Liquid Col. 43 ml

Sample Vol. _____ scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligram)	Percent
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<u>125</u>	_____	_____	<u>57.96</u>	<u>43.47</u>
<u>60</u>	_____	_____	<u>24.99</u>	<u>18.74</u>
<u>45.</u>	_____	_____	<u>6.1</u>	<u>4.57</u>
<u>34.53</u>	_____	_____	<u>1.8</u>	<u>1.35</u>
<u>27.01</u>	_____	_____	<u>4.0</u>	<u>3.0</u>
<u>18.73</u>	_____	_____	<u>4.2</u>	<u>3.15</u>
<u>12.1</u>	_____	_____	<u>4.2</u>	<u>3.15</u>
<u>6.2</u>	_____	_____	<u>4.1</u>	<u>3.08</u>
<u>3.81</u>	_____	_____	<u>10.4</u>	<u>7.80</u>
<u>2.48</u>	_____	_____	<u>15.6</u>	<u>11.70</u>
Total			<u>133.35</u> Milligrams	

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-6
DATE December 5, 1978
PROJECT NO. G.S.A.
BOILER NO. 1
DURATION OF TEST _____

FACTORS
INTEGRATOR x 1000
CHART x 1000

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART	SUPER HEAT TEMP.	FEED WATER		FLUE GAS TEMP.	COND. AIR TEMP.	COND. AIR TEMP.	PRESSURES		F. W. PRESS.	WIND BOX	ZONE FURN.	ZONE UPPER	ZONE 3	ZONE 4	ZONE 5	FURN.	DUST COLL. IN	DUST COLL. OUT	STACK DE N. R.	Boiler CO ₂	Boiler O ₂	Boiler CO	REMARKS
				IN	OUT				DRUM	HPR.															
12:00		8421.8	11.0	14.0	220	-	420	70	-	112	111	116	0.8	0.10	0.38	-	-	-				10.6	8.9	0	12 noon - full ashtr.
12:30		8423.7	15.0	16.0	218	-	400	70	-	112	111	116	1.0	0.10	0.35							11.2	7.8	0	Boiler 5007
1:00		8426.6	15.5	17.0	218	-	430	70	-	112	110	116	0.9	0.12	0.40							12.0	6.8	0	
1:30		8428.6	16.5	16.5	214	-	440	70	42	111	109	116	0.8	0.12	0.38							12.6	6.0	0	Controls - Air AM
2:00		8431.2	14.0	15.0	214	-	450	69	-	112	109	115	0.7	0.11	0.35							10.7	8.3	0	Outlet Batching Auto.
2:30		8434.1	14.0	13.5	214	-	430	69	-	112	110	115	0.6	0.10	0.33							11.2	7.8	0	Stoker - Manual
3:00		8436.0	13.0	14.0	214	-	425	69	43	112	110	115	0.6	0.10	0.32							10.8	8.2	0	
3:30		8438.8	16.0	16.5	220	-	450	69	41	111	107	117	0.9	0.10	0.42							10.4	8.7	0	Stack - Clean
4:00		8441.2	17.0	16.0	215	-	460	70	-	111	108	116	0.9	0.11	0.40							11.6	7.3	0	To Light Haze
4:30		8445.6	16.5	16.5	217	-	460	70	39	109	106	117	1.1	0.12	0.45							10.8	7.9	0	
5:00		8447.3	17.0	16.5	217	-	461	70	-	110	107	116	1.0	0.11	0.43							11.1	7.8	0	
5:30		8450.3	17.5	17.5	220	-	470	68	-	109	105	116	1.0	0.12	0.45							12.0	6.7	0	
5:50		8452.4	18.0	17.5	220	-	478	68	-	108	109	116	1.1	0.12	0.47							12.2	6.6	0	
Avg		-	-	-	217	-	69	-	111	110	116	-	-	-								11.3	7.6	0	

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-6
DATE December 6, 1977
PROJECT NO. 0-0A
BOILER NO. 1
DURATION OF TEST _____

FACTORS
INTEGRATOR X 1.000
CHART X 1.000

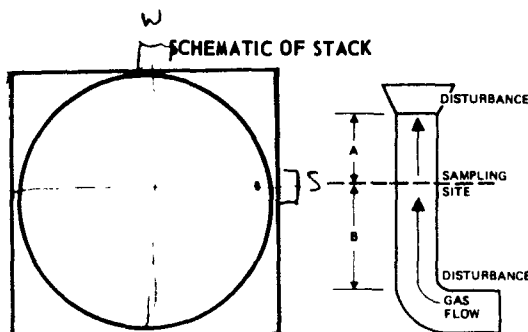
TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART	SUPER HEAT TEMP. AIR/CO ₂	FEED WATER TEMP. & COND.		FLUE GAS TEMP. COND. W-W	COMB. AIR TEMP.	SAT. STM. COND. W-W	PRESSURES		F. W. PRESS.	WIND BOX	ZONE 1 FOR UPRAK	ZONE 2 FOR UPRAK	ZONE 3	ZONE 4	ZONE 5	FURN.	DUST COLL. IN	DUST COLL. OUT	STACK DEN. R.	Boiler CO ₂	Boiler O ₂	Boiler CO	REMARKS	
				IN	OUT				DRUM	HPR.																
PARTICULATE EMISSION / PARTICULATE SIZE TEST																										
9:30		8520.3	14.5	14.0	215	-	432	79	39	111	108	116	0.7	0.12	0.35	-	-	-	-				11.0	8.1	0	P AM - FULL ASHES,
10:00	2075	8526.6	18.0	19.0	214	-	425	74	-	105	101	114	1.3	0.07	0.58	-	-	-	-				11.2	7.8	0	ALONG 5001, ADD 6000
10:30		8530.5	17.5	21.5	213	-	500	74	40	104	99	114	1.5	0.07	0.61	-	-	-	-				10.4	8.8	0	10:40 START TEST
11:00		8532.2	17.0	19.0	214	-	425	74	-	109	99	114	1.2	0.12	0.59	-	-	-	-				9.8	9.2	0	11:47 RAKE FIRE
11:30	2065	8535.7	15.0	20.0	214	-	422	74	41	104	99	114	1.2	0.12	0.60	-	-	-	-				11.4	7.5	0	12:22 RAKE FIRE
12:00		8538.3	14.5	13.0	213	-	445	75	-	108	103	115	1.0	0.12	0.36	-	-	-	-				12.5	6.3	0	
12:30	2060	8541.2	17.0	15.0	213	-	450	75	42	111	107	115	1.4	0.12	0.45	-	-	-	-				13.2	5.5	0	STACK CLEAN TO
1:00		8544.4	18.5	17.5	214	-	470	75	-	106	103	114	1.6	0.12	0.52	-	-	-	-				10.6	8.5	0	SILENT HALL
1:30	2015	8547.3	17.0	17.0	214	-	472	74	42	106	103	114	1.6	0.11	0.54	-	-	-	-				10.8	8.1	0	
2:00		8550.5	17.5	17.5	214	-	485	74	-	105	101	115	2.0	0.08	0.60	-	-	-	-				10.4	8.8	0	LEVEL COAL HOPPER
2:30	2070	8551.0	16.0	18.0	214	-	482	74	45	106	102	114	1.9	0.10	0.55	-	-	-	-				8.9	10.4	0	9:30 AM AND 3:00 PM
3:00	1975	8556.2	18.0	12.0	214	-	480	74	-	108	103	114	1.1	0.11	0.50	-	-	-	-				10.1	8.1	0	
Ave.		-	-	-	-	-	74	-	-	107	103	114	-	-	-	-	-	-	-				10.8	8.2	0	WEATHER - CLEAR MAX. TEMP - 45°F MIN. TEMP - 39°F
	COAL TO WHICH LOBBY	-	-	-	11,269 LB	-	-	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	
	COAL SAMPLE	-	-	-	- 158	-	-	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	
	COAL BURNED	-	-	-	11,612 LB	-	-	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	

SECTION 7.0

SITE L7 DATA

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PARTICULATE LAB WORKSHEET	65
IMPACTOR DATA SHEETS	66
BAHCO SIZE DATA SHEETS	68
BOILER SYSTEM TEST DATA SHEETS	70

PARTICULATE FIELD DATA



PLANT L-7
 DATE 12/13/78
 LOCATION Root-Stub
 OPERATOR Davis - And
 STACK NO. Boiler #5
 RUN NO. Calibration
 SAMPLE BOX NO. -
 METER BOX NO. CAES

AMBIENT TEMPERATURE 38
 BAROMETRIC PRESSURE 29.03
 ASSUMED MOISTURE, % 5
 PROBE LENGTH, in. 60
 NOZZLE DIAMETER, in. 1/4
 STACK DIAMETER, in. 46
 PROBE HEATER SETTING Full
 HEATER BOX SETTING 250

METER ΔH_g 1.89
 C FACTOR .81

PROCESS WEIGHT RATE _____

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP _s) (√ΔP _s)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY fps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
1	6.0	-0.7	462	.32	.67	.69	77.20	47		200	36	2.5	
2	"	"	519	.35	.80	.80	-	47		200	36	2.5	
3	"	"	533	.40	.90	.90	-	46		200	36	3.0	
4	"	"	540	.48	1.1	1.1	-	48		200	37	3.5	
5	"	"	548	.53	1.2	1.2	-	48		200	37	3.5	
6	"	"	547	.55	1.25	1.25	-	50		200	38	3.5	
7	"	"	538	.50	1.1	1.1	93.3	50		200	38	3.5	
8	"	"	534	.42	.93	.93	96.15	50		210	39	3.0	
9	"	"	536	.42	.93	.93	98.80	50		212	38	3.0	
10	"	"	535	.40	.90	.90	101.50	50		214	39	3.0	
11	"	"	535	.39	.89	.89	-	49		216	40	3.0	
12	"	"	536	.37	.82	.82	106.50	50		219	40	3.0	
							109.01						
TOTAL	6.0		6367		7.820								

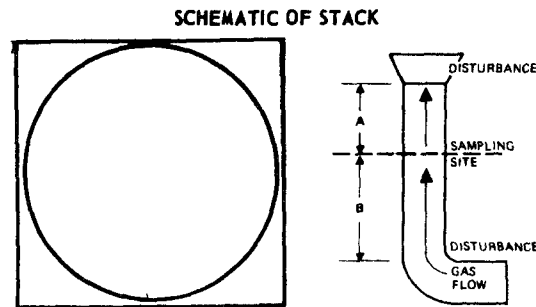
AVERAGE -0.7

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL					
INITIAL					
LIQUID COLLECTED					
TOTAL VOLUME COLLECTED					

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2					
3					
4					

COMMENTS:

PARTICULATE FIELD DATA



CROSS SECTION
Stop 1058

PLANT L-7 AMBIENT TEMPERATURE 38
DATE 12/13/78 BAROMETRIC PRESSURE 29.03
LOCATION Root-Stub Stack ASSUMED MOISTURE, % 50
OPERATOR Davis Anderson PROBE LENGTH, in. 60
STACK NO. Boiler #5 NOZZLE DIAMETER, in. 1/4
RUN NO. Certificate STACK DIAMETER, in. 46
SAMPLE BOX NO. RAC PROBE HEATER SETTING Full
METER BOX NO. CAES HEATER BOX SETTING 300

He Winds Leak Test Stop 1019 c
@ 15" Hg

METER ΔH_g 1.87
C FACTOR .81
PROCESS WEIGHT RATE

WEIGHT OF PARTICULATE COLLECTED, mg		
SAMPLE	FILTER	PROBE WASH
FINAL WEIGHT		
TARE WEIGHT		
WEIGHT GAIN		
TOTAL		

TRAVERSE POINT NUMBER	SAMPLING TIME (t), min.	STATIC PRESSURE (in. H ₂ O)	STACK TEMPERATURE (T _s), °F	VELOCITY HEAD (ΔP_s) ($\sqrt{\Delta P_s}$)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (ΔH) in. H ₂ O		GAS SAMPLE VOLUME (V _m), ft ³	GAS SAMPLE TEMPERATURE AT DRY GAS METER		SAMPLE BOX TEMPERATURE °F	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER °F	PUMP VACUUM in. Hg gauge	VELOCITY lps
					ACTUAL	DESIRED		INLET (T _{m IN}), °F	OUTLET (T _{m OUT}), °F				
W-1	5 min	-1.07	495	.33	.69	.69	109.01	48		198	39	2.8	
2	"	"	524	.38	.83	.83	111.3	48		200	41	3.2	
3	"	"	536	.35	.75	.75	-	48		200	42	3.0	
4	"	"	526	.38	.85	.85	116.2	50		208	42	3.5	
5	"	"	536	.45	1.0	1.0	118.7	50		212	43	3.5	
6	"	"	548	.45	1.0	1.0	121.	50		213	44	3.5	
7	"	"	580	.40	.9	.9	-	50		223	45	3.0	
8	"	"	547	.35	.75	.75	-	51		230	46	3.0	
9	"	"	549	.35	.75	.75	129.3	51		230	47	3.0	
10	"	"	543	.35	.75	.75	-	50		230	47	3.0	
11	"	"	546	.38	.85	.85	134.1	50		233	46	3.0	
12	"	"	520	.30	.69	.69	136.6	50		233	47	3.0	
							138.835						
					13.12	9.83							
TOTAL	120		12563		15.132	21.34	61.635	1181		5078	983	74.5	
AVERAGE		-1.07	533	.398	1.6305	.889		49		212	41	3.1	

VOLUME OF LIQUID WATER COLLECTED	IMPINGER VOLUME ml				SILICA GEL WEIGHT, g
	1	2	3	4	
FINAL					
INITIAL					
LIQUID COLLECTED					
TOTAL VOLUME COLLECTED					

ORSAT MEASUREMENT	TIME	CO ₂	O ₂	CO	N ₂
1					
2					
3					
4					

COMMENTS:

PARTICULATE LAB WORKSHEET

Site Desig. L7

Date Dec 13, 78

Sample Loc. _____

	beaker #	final wt (gm)	initial wt (gm)	Δ wt (gm)
Impinger catch and H ₂ O rinse after filter (water sol. only)	<u>T-1</u>	<u>101.1167</u>	<u>101.0142</u>	<u>.1025</u>
	<u>T-2</u>	<u>99.1921</u>	<u>99.6761</u>	<u>.1196</u>
H ₂ O rinse before filter (water sol. only)	<u>T-3</u>	<u>25.22</u>	<u>25.1151</u>	<u>.0399</u>
Acetone rinse after filter	<u>T-4</u>	<u>91.7115</u>	<u>91.706</u>	<u>.0050</u>
Acetone rinse before filter	<u>T-5</u>	<u>92.3226</u>	<u>92.321</u>	<u>.0003</u>
	Filter #			
Impinger catch and H ₂ O rinse after filter (water insol. only)	<u>51-8</u>	<u>.07790</u>	<u>.07790</u>	<u>0</u>
	<u>56-45</u>	<u>.041</u>	<u>.041</u>	<u>0</u>
	<u>69-22</u>	<u>.10671</u>	<u>.10671</u>	<u>0</u>
H ₂ O rinse before filter (water insol. only)	<u>10-1</u>	<u>.1111</u>	<u>.07746</u>	<u>.11649</u>
	<u>5-14</u>	<u>.071</u>	<u>.07108</u>	<u>0</u>
	<u>70-23</u>	<u>.10402</u>	<u>.10405</u>	<u>0</u>
Test Filter	<u>119</u>	<u>.6727</u>	<u>.67277</u>	<u>.26598</u>
TOTAL MASS				<u>.67977</u>

Dry Gas Meter Vol. (ft³)
 Final 138.5
 Initial 10.5
 Δ DgV 128.0

Imp. Water Vol. (Ml.)	1	2	3	4
	<u>134</u>	<u>102</u>	<u>1</u>	<u>213.3</u>
	<u>100</u>	<u>100</u>	<u>1</u>	<u>200</u>
	<u>34</u>	<u>2</u>	<u>1</u>	<u>13.3</u>
Total H ₂ O				<u>51.3</u>

IMPACTOR DATA SHEET

Site Desig. L7

Date Dec 18, 70

Sample Location After Collector

Sample No. _____

P_b 29.35

Assmd Moisture 4%

Noz. Dia. 3/16"

Stk. Dia 46"

Sample Point _____

Sample Time 45 MIN

Stat P -.07"H₂O

Pitot Tube ΔP .43"H₂O

Stk T 510°F

ΔH Orifice 2.43"H₂O

Liquid Col. 31.8 ml

Sample Vol. 37.76 scf

D _p	Net Wt. (milligm)	Percent
<u>135</u>	<u>4.0</u>	<u>3.44</u>
<u>60</u>	<u>1.09</u>	<u>.94</u>
<u>45</u>	<u>0</u>	<u>0</u>
<u>30</u>	<u>0</u>	<u>0</u>
<u>14.91</u>	<u>12.92</u>	<u>11.16</u>
<u>9.76</u>	<u>13.59</u>	<u>11.68</u>
<u>6.04</u>	<u>16.13</u>	<u>13.87</u>
<u>4.06</u>	<u>11.52</u>	<u>9.90</u>
<u>2.74</u>	<u>11.42</u>	<u>9.82</u>
<u>1.72</u>	<u>7.81</u>	<u>6.77</u>
<u>.81</u>	<u>8.03</u>	<u>6.95</u>
<u>.45</u>	<u>8.60</u>	<u>7.39</u>
<u>.26</u>	<u>11.06</u>	<u>18.10</u>
Total	<u>116.34</u> Milligrms	

IMPACTOR DATA SHEET

Site Desig. L7

Date Dec 13, 78

Sample Location Between Collector

Sample No. _____

P_b 2215"Hg

Assmd Moisture 3%

Noz. Dia. 3/8"

Stk. Dia 24"-120"

Sample Point _____

Sample Time 45 MIN

Stat P -.88"H₂O

Pitot Tube ΔP .15 "H₂O

Stk T 600°F

ΔH Orifice 1.65"H₂O

Liquid Col. .18 ml

Sample Vol. 28.5 scf

D _p	Net Wt. (milligm)	Percent
<u>125</u>	<u>29.56</u>	<u>10.73</u>
<u>60</u>	<u>30.64</u>	<u>29.27</u>
<u>45</u>	<u>5.44</u>	<u>1.97</u>
<u>30</u>	<u>5.0</u>	<u>1.82</u>
<u>16.40</u>	<u>11.11</u>	<u>9.90</u>
<u>10.74</u>	<u>25.27</u>	<u>10.26</u>
<u>6.64</u>	<u>26.06</u>	<u>9.46</u>
<u>4.47</u>	<u>16.54</u>	<u>6.00</u>
<u>3.61</u>	<u>12.15</u>	<u>4.41</u>
<u>1.87</u>	<u>6.91</u>	<u>2.53</u>
<u>.87</u>	<u>7.11</u>	<u>3.51</u>
<u>.411</u>	<u>5.14</u>	<u>3.17</u>
<u>.276</u>	<u>19.24</u>	<u>6.98</u>
Total	<u>275.4</u> Milligrams	

BAHCO SIZE DATA SHEET

Site Desig. L 7

Date Dec 14, 1957

Sample Location 1000 Gill St.

Sample No. _____

P_b 29.35

Assmd Moisture 5%

Noz. Dia. 3/8"

Stk. Dia 46"

Sample Point _____

Sample Time 1200 AM

Stat P -0.07"H₂O

Pitot Tube ΔP .36"H₂O

Stk T 511°F

ΔH Orifice 2.32"H₂O

Liquid Col. 68 ml

Sample Vol. _____ scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligram)	Percent
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<u>125</u>	_____	_____	<u>41.69</u>	<u>31.17</u>
<u>60</u>	_____	_____	<u>18.67</u>	<u>13.96</u>
<u>45</u>	_____	_____	<u>7.4</u>	<u>5.53</u>
<u>12.7</u>	_____	_____	<u>3.3</u>	<u>2.47</u>
<u>6.8</u>	_____	_____	<u>11.2</u>	<u>8.37</u>
<u>3.84</u>	_____	_____	<u>7.3</u>	<u>5.46</u>
<u>2.48</u>	_____	_____	<u>44.2</u>	<u>23.04</u>
Total			<u>133.76</u>	
			Milligrams	

BAHCO SIZE DATA SHEET

Site Desig. L7

Date Dec 13, 78

Sample Location Before Coll. #1

Sample No. _____

P_b 28.95

Assmd Moisture 5%

Noz. Dia. 3/8"

Stk. Dia 12"-120"

Sample Point _____

Sample Time 80 M.N

Stat P 1.88"H₂O

Pitot Tube ΔP .187"H₂O

Stk T 600°F

ΔH Orifice 2.18"H₂O

Liquid Col. 23 ml

Sample Vol. _____ scf

D _p	Initial Wt. (grams)	Final Wt. (grams)	Net Wt. (milligram)	Percent
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<u>125</u>	_____	_____	<u>202.50</u>	<u>42.70</u>
<u>60</u>	_____	_____	<u>87.46</u>	<u>17.91</u>
<u>45</u>	_____	_____	<u>25.5</u>	<u>5.22</u>
<u>34.53</u>	_____	_____	<u>12.1</u>	<u>2.48</u>
<u>21.01</u>	_____	_____	<u>4.5</u>	<u>6.41</u>
<u>18.13</u>	_____	_____	<u>2.9</u>	<u>5.51</u>
<u>17.7</u>	_____	_____	<u>2.2</u>	<u>4.26</u>
<u>6.2</u>	_____	_____	<u>19.1</u>	<u>2.91</u>
<u>2.4</u>	_____	_____	<u>26.1</u>	<u>5.35</u>
<u>2.48</u>	_____	_____	<u>30.5</u>	<u>6.25</u>
Total			<u>483.46</u>	
			Milligrams	

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-7 _____
DATE DECEMBER 14, 1978 _____
PROJECT NO. 6-3A _____
BOILER NO. 5 _____
DURATION OF TEST _____

FACTORS
INTEGRATOR x 600
CHART x 1000
 150 PSI

[illegible]

DATA SHEET BOILER SYSTEM TEST

INSTITUTION _____
LOCATION Site L-7
DATE December 13, 1978
PROJECT NO. 0.3A
BOILER NO 5
DURATION OF TEST _____

FACTORS
INTEGRATOR x 600
CHART x 1000
@ 150 PSI

TIME	COAL WEIGHT	STEAM FLOW INTEGRATOR CHART	SUPER HEAT TEMP.	FEED WATER TEMP @ ECON	FLUE GAS TEMP. ECON	COMB. AIR TEMP.	SAT. STM. COND MM	PRESSURES	F. W.	WIND BOX	ZONE	ZONE	ZONE	ZONE	ZONE	FURN.	DUST COLL. DIFF IN	DUST COLL. OUT	STACK DEN. R.	CO ₂	O ₂	CO	REMARKS			
		Flow	Temp	IN	OUT			DRUM	HPR.	PRESS.	1	2	3	4	5											
PARTICULATE EMISSION / PARTICULATE SIZE TEST																										
AN 8:00	1370	29.0	153392	42.0	226	-	595	68	-	150	187	170	2.1	0.10	0.70	-	-	-	-	2.2	3.0	-	8.9	10.4	0	7:00 AM FULL ASH
8:30		31.5	153925	42.0	226	-	580	70	-	150	187	170	2.0	0.11	0.70	-	-	-	-	1.8	2.5	-	8.4	11.0	0	8:00 LEVEL STOKER
9:00		24.0	153488	47.0	226	-	615	71	-	148	145	167	2.2	0.05	0.80	-	-	-	-	2.7	3.8	-	8.4	11.0	0	HOPPER
9:30	1790	31.5	153472	48.0	226	-	600	71	-	130	130	175	2.5	0.05	0.75	-	-	-	-	2.8	3.8	-	8.0	12.0	0	10:00 RARE FULL ASH
10:00		31.0	153502	40.0	226	-	600	71	-	150	150	173	2.1	0.02	0.65	-	-	-	-	2.3	3.2	-	8.2	11.3	0	11:15 LEVEL STOKER
10:30	1920	29.0	153519	45.0	226	-	610	71	-	148	145	170	2.0	0.11	0.80	-	-	-	-	2.0	3.8	-	8.8	10.5	0	HOPPER
11:00	1790	31.5	153555	40.0	226	-	600	71	-	150	150	172	1.7	0.22	0.80	-	-	-	-	2.7	3.7	-	8.2	11.3	0	1:00 PM RARE FIRES
11:30	1790	25.5	153581	38.0	226	-	560	71	-	155	155	171	0	0.36	0.33	-	-	-	-	1.8	2.7	-	8.1	11.4	0	3:00 RARE FIRES
12:00	1790	23.5	153599	35.0	226	-	540	71	-	152	152	175	1.1	0.23	0.55	-	-	-	-	1.3	2.0	-	7.8	11.7	0	
PM 12:30	110441	30.0	153620	45.0	227	-	570	72	-	145	142	172	1.7	0.05	0.80	-	-	-	-	2.6	3.6	-	7.1	12.9	0	STACK CLEAR
1:00	1780	23.5	153692	42.0	226	-	560	71	-	151	150	170	1.5	0.12	0.65	-	-	-	-	2.9	3.8	-	6.6	13.1	0	
1:30		22.5	153687	42.0	226	-	510	71	-	150	148	170	1.2	0.13	0.60	-	-	-	-	1.0	1.8	-	7.2	11.6	0	
2:00	111053	22.5	153684	35.0	225	-	540	70	-	150	150	170	1.0	0.24	0.55	-	-	-	-	0.9	2.5	-	6.6	13.1	0	
2:30	1790	24.0	153702	36.0	226	-	510	69	-	155	153	175	1.0	0.15	0.55	-	-	-	-	1.2	2.8	-	8.8	10.5	0	
3:00		25.0	153723	38.0	225	-	575	66	-	152	153	170	1.3	0.14	0.65	-	-	-	-	1.5	2.5	-	7.4	12.4	0	
3:30	1115024	23.0	153742	37.0	226	-	540	67	-	153	152	170	1.1	0.17	0.55	-	-	-	-	1.2	1.7	-	8.6	10.8	0	
AVE.		-	-	-	226	-	-	70	-	149	148	172	-	-	-	-	-	-	-	8.0	11.6	0				
	COAL, WASH LARRY 10750 LB																									
	COAL, SAMPUS - 102																									
	COAL, BVARIO 10648 LB																									
	(8 AM TO 11:15 AM)																									

TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)			
1. REPORT NO. EPA-600/7-81-020b		3. RECIPIENT'S ACCESSION NO.	
4. TITLE AND SUBTITLE Field Tests of Industrial Stoker Coal-Fired Boilers for Emissions Control and Efficiency Improvement--Sites L1-L7 (Data Supplement)		5. REPORT DATE April 1981	
7. AUTHOR(S) J.W. Davis and H.K. Owens		6. PERFORMING ORGANIZATION CODE	
9. PERFORMING ORGANIZATION NAME AND ADDRESS The Pennsylvania State University University Park, Pennsylvania 16802		8. PERFORMING ORGANIZATION REPORT NO.	
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		10. PROGRAM ELEMENT NO. EHE624	
		11. CONTRACT/GRANT NO. EF-77-C-01-2609 (DoE) and IAG-D7-E681FZ (EPA)	
		13. TYPE OF REPORT AND PERIOD COVERED Supplement; 2/78-5/79	
		14. SPONSORING AGENCY CODE EPA/600/13	
15. SUPPLEMENTARY NOTES IERL-RTP project officer is Robert E. Hall, Mail Drop 65, 919/541-2477. Data supplements are also available for Sites A-K.			
16. ABSTRACT The supplement is a compilation of test data presented in greater detail than was practical in the related final technical report (EPA-600/7-81-020a). It provides details to researchers who are interested in performing their own analyses. The final technical report gives objectives; describes facilities tested, coals fired, and test equipment; outlines procedures; and provides interpretations and conclusions. The supplement contains panel board data for each test, detailed particulate data, and particle size distribution data.			
17. KEY WORDS AND DOCUMENT ANALYSIS			
a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Emission	Pollution Control	13B 14G
Boilers	Efficiency	Stationary Sources	13A
Stokers	Dust	Industrial Boilers	11G
Field Tests	Aerosols	Test Data	14B 07D
Coal	Particle Size Distribution	Particulate	21D
Combustion			21B
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