

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

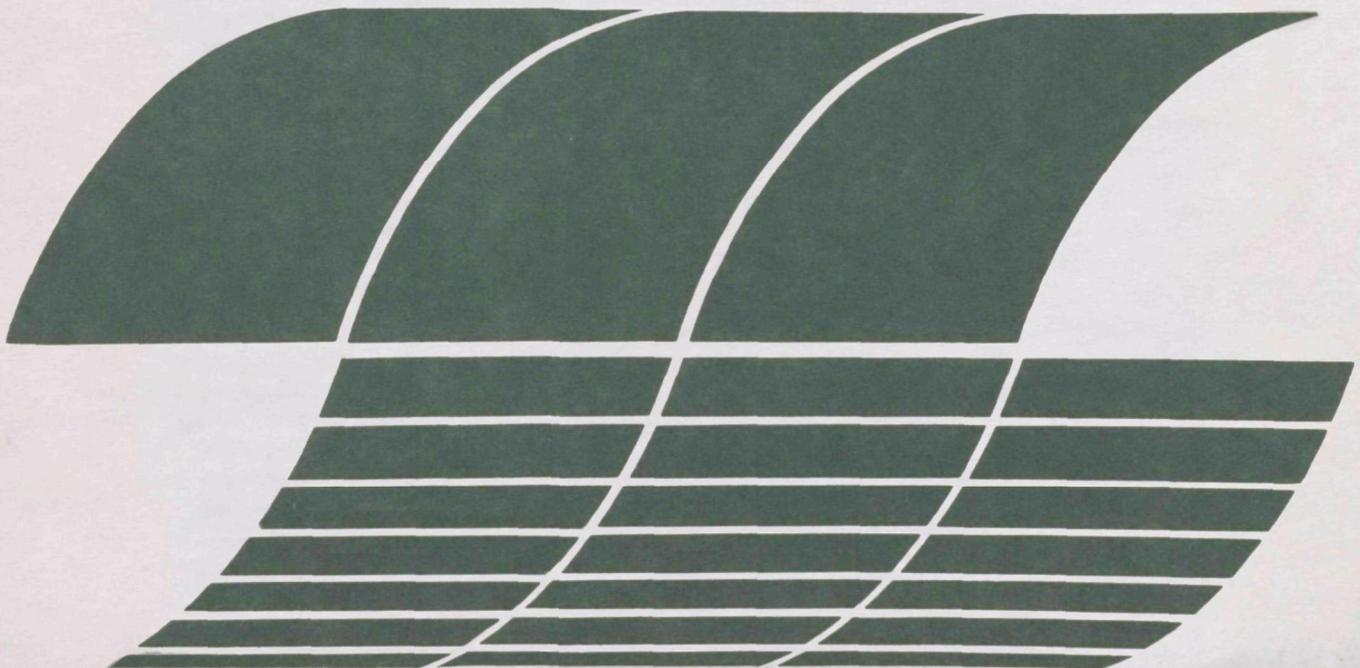
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Industrial Environmental Research
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April 1980

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

Interagency
Energy/Environment
R&D Program Report



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April 1980

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

by

**J.O. Burlingame, R.A. Parker, W.M. Jackson,
and J.D. Demont**

**KVB, Inc.
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422**

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Project Officers: R. Hall (EPA) and W. Harvey, Jr. (DoE)

**Industrial Environmental Research Laboratory
Office of Environmental Engineering and Technology
Research Triangle Park, NC 27711**

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Washington, DC 20545**

and

**AMERICAN BOILER MANUFACTURERS ASSOCIATION
1500 Wilson Boulevard
Arlington, VA 22209**

ABSTRACT

The Data Supplement is a compilation of test data presented in greater detail than was practical in the Final Technical Report. 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 Supplement contains panel board data for each test, detailed particulate, O₂, CO₂, NO, SO₂ and SO₃ data, particle size distribution data, modified smoke spot data, chemical analysis of the coal and coal size consistency data.

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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 type (i.e., Panel Board Data, Particulate Data, etc.) and within each type by test number. Data summaries where they exist are at the front of each section. The boiler tested is referred to as Boiler E; as it is the fifth boiler tested under the program entitled, "A Testing Program to Update Equipment Specifications and Design Criteria for Stoker Fired Boilers."

¹Gabrielson, J. E., et al, "Field Tests of Industrial Stoker Coal-Fired Boilers for Emissions Control and Efficiency Improvement - Site E."

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

FOR TYPICAL COAL FUEL

ppm @ 3% O ₂ (SO ₂)	ng/J (lb/10 ⁶ Btu)	0.851 (1.98x10 ⁻³)
ppm @ 3% O ₂ (SO ₃)	ng/J (lb/10 ⁶ Btu)	1.063 (2.47x10 ⁻³)
ppm @ 3% O ₂ (NO)*	ng/J (lb/10 ⁶ Btu)	0.399 (9.28x10 ⁻⁴)
ppm @ 3% O ₂ (NO ₂)	ng/J (lb/10 ⁶ Btu)	0.611 (1.42x10 ⁻³)
ppm @ 3% O ₂ (CO)	ng/J (lb/10 ⁶ Btu)	0.372 (8.65x10 ⁻⁴)
ppm @ 3% O ₂ (CH ₄)	ng/J (lb/10 ⁶ Btu)	0.213 (4.95x10 ⁻⁴)

*Federal environmental regulations express NO_x in terms of NO₂;
thus NO units should be converted using the NO₂ conversion factor.

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	0.000881
J/hr/m ³	BTU/ft ³ /hr	0.000269
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

FOR TYPICAL COAL FUEL

ng/J	ppm @ 3% O ₂ (SO ₂)	1.18
ng/J	ppm @ 3% O ₂ (SO ₃)	0.941
ng/J	ppm @ 3% O ₂ (NO)	2.51
ng/J	ppm @ 3% O ₂ (NO ₂)	1.64
ng/J	ppm @ 3% O ₂ (CO)	2.69
ng/J	ppm @ 3% O ₂ (CH ₄)	4.69

SI PREFIXES

Multiplication Factor	Prefix	SI Symbol
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

EMISSION UNITS CONVERSION FACTORS
FOR TYPICAL COAL FUEL (HV = 13,320 BTU/LB)

To Obtain	Multiply By	% Weight in Fuel		lbs/10 ⁶ Btu		grams/10 ⁶ Cal		PPM (Dry @ 3% O ₂)		Grains/SCF. (Dry @ 12% CO ₂)	
		S	N	SO ₂	NO ₂	SO ₂	NO ₂	SO _x	NO _x	SO ₂	NO ₂
% Weight In Fuel	S	1		0.666	/	0.370	/	13.2x10 ⁻⁴	/	1.48	/
	N			/	0.405	/	0.225	/	5.76x10 ⁻⁴	/	.903
lbs/10 ⁶ Btu	SO ₂	1.50	/	1		(.556)	/	19.8x10 ⁻⁴	/	(2.23)	/
	NO ₂	/	2.47			/	(.556)	/	14.2x10 ⁻⁴	/	(2.23)
grams/10 ⁶ Cal	SO ₂	2.70	/	1				35.6x10 ⁻⁴	/	(4.01)	/
	NO ₂	/	4.44					/	(1.8)	/	25.6x10 ⁻⁴
PPM (Dry @ 3% O ₂)	SO _x	758	/	505	/	281	/	1		1127	/
	NO _x	/	1736	/	704	/	391			/	1566
Grains/SCF (Dry @ 12% CO ₂)	SO ₂	.676	/	(.448)	/	(.249)	/	8.87x10 ⁻⁴	/	1	
	NO ₂	/	1.11	/	(.448)	/	(.249)	/	6.39x10 ⁻⁴		

TIIA

NOTE: 1. Values in parenthesis can be used for all flue gas constituents such as oxides of carbon, oxides of nitrogen, oxides of sulfur, hydrocarbons, particulates, etc.
2. Standard reference temperature of 530°R was used.

SECTION 1.0
PANEL BOARD DATA

1.1 CONTROL ROOM DATA SHEETS

PAGE 2

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr _____

Load, % _____

Coal, lb/hr _____

TEST NO.	1				
DESCRIPTION	Max load with pass fans				
COAL	Kent Coal	Industrial	Mine		
DATE	11/5				
STEAM INTEGRATOR x 200 lbs.	750167				
TIME	14:28				
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	1.0				
RELATIVE AIR FLOW (green)	1.64				
STEAM TEMPERATURE, °F (blue)	432				
STEAM INDICATOR X 1000 lb/hr	107				
DRUM LEVEL (red)	-2				
OXYGEN, % (green)	4.9				
SMOKE x 0.5 RINGLEMAN (blue)	33				
DRUM INDICATOR X 1 inch	-2				
ECON GAS IN, °F (red)	560				
ECON GAS OUT, °F (green)	340				
ECON WATER IN, °F (blue)	217				
ECON WATER OUT, °F (purple)	215				

KVB

TEST NO.	1			
STEAM HEADER PRESS, psig	170			
DRUM PRESSURE (black), psig	194			
FEEDWATER PRESS (red), psig	268			
<u>DRAFT GAUGES</u>				
WINDBOX, "H ₂ O	0.6			
FURNACE, "H ₂ O	-1.26			
BOILER OUTLET, "H ₂ O	-0.8			
ECONOMIZER OUTLET, "H ₂ O	-3.5			
COLLECTOR OUTLET, "H ₂ O	-5.2			
OVERFIRE AIR FRONT, "H ₂ O	28			
OVERFIRE AIR REAR, "H ₂ O	23			
<u>CONTROLS</u>				
FUEL FEED	27			
STEAM FLOW/AIR FLOW (AUX)	100+			
F.D. DAMPER	—			
STEAM FLOW/AIR FLOW	76			
OVERFIRE AIR	45			
FURNACE DRAFT	45			
ID FAN AMPS	605			
FD FAN AMPS	—			

KVB

TEST NO.	1				
GRATE SPEED, REL.	28				
GRATE PRESSURE, PSIG	35				
GRATE #1 FEEDER LENGTH, REL.	16				
GRATE #2 FEEDER LENGTH, REL.	22				
GRATE #3 FEEDER LENGTH, REL.	20				
GRATE #4 FEEDER LENGTH, REL.	14				
FRONT OVERFIRE AIR (upper/lower) "H ₂ O					
REAR OVERFIRE AIR (upper/lower) "H ₂ O					
REINJECTION AIR, "H ₂ O					
ASH BED THICKNESS, inches	2-3"				
COAL SCALE #1 x 200 lbs	271344				
COAL SCALE #2 x 200 lbs	367796				
TIME OF READING	1455				

KVB

NOTES

TEST NO: 1	Plan was for boiler to 150 x 100 ft and with panel furnace
	Plan was not for reaction plant for in wide open.
	Steam in turbine is off needs to be re-validated
TEST NO: 2	Test cancelled because of momentary readings (velocity)
	at 10:00 AM out
TEST NO:	
TEST NO:	

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 71,222
 Load, % 50.7
 Coal, lb/hr 9886

TEST NO.	2				
DESCRIPTION	max limit with Furnas				
COAL	Kent Coal	Industrial	Main		
DATE	11-16		11-16		
STEAM INTEGRATOR x 200 lbs.	761679	762578	763359		
TIME	14:09	16:01	17:50		
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	0.92	0.95	0.95	} 94,000	
RELATIVE AIR FLOW (green)	1.64	1.63	1.64		
STEAM TEMPERATURE, °F (blue)	432	430	430		
STEAM INDICATOR X 1000 lb/hr	100	102	102	} 101,000	
DRUM LEVEL (red)	-1.0	-1.2	-1.2		
OXYGEN, % (green)	6.4	5.5	5.5		
SMOKE x 0.5 RINGLEMAN (blue)	2.4	2.3	2.5		
DRUM INDICATOR X 1 inch	-1.0	-1.2	-1.2		
ECON GAS IN, °F (red)	560	560	560		
ECON GAS OUT, °F (green)	335	330	332		
ECON WATER IN, °F (blue)	210	205	205		
ECON WATER OUT, °F (purple)	270	270	270		

KVB

TEST NO.	2			
STEAM HEADER PRESS, psig	190	190	190	
DRUM PRESSURE (black), psig	190	190	195	
FEEDWATER PRESS (red), psig	267	270	265	
<u>DRAFT GAUGES</u>				
WINDBOX, "H ₂ O	0.6	0.6	0.5	
FURNACE, "H ₂ O	-1.6	-1.3	-1.3	
BOILER OUTLET, "H ₂ O	.70	-.65	-.65	
ECONOMIZER OUTLET, "H ₂ O	3.3	3.3	3.3	
COLLECTOR OUTLET, "H ₂ O	4.4 5.0	5.0	5.4	
OVERFIRE AIR FRONT, "H ₂ O	28 28	28	28	
OVERFIRE AIR REAR, "H ₂ O	20	30	30	
<u>CONTROLS</u>				
FUEL FEED	47	60	60	
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+	
F.D. DAMPER	—	—	—	
STEAM FLOW/AIR FLOW	55 60	60	60	
OVERFIRE AIR	55	62	62	
FURNACE DRAFT	45	45	45	
ID FAN AMPS	100	100	100	
FD FAN AMPS	—	—	—	

KVB

TEST NO.	2			
GRATE SPEED, REL.	0.8	1.0		
GRATE PRESSURE, PSIG	30	30		
GRATE #1 FEEDER LENGTH, REL.	22	22		
GRATE #2 FEEDER LENGTH, REL.	24	21		
GRATE #3 FEEDER LENGTH, REL.	20	20		
GRATE #4 FEEDER LENGTH, REL.	20	20		
FRONT OVERFIRE AIR (upper/lower) psi	1 1/2 / 1 1/8			
REAR OVERFIRE AIR (upper/lower) psi	1.0 / 1.0			
REINJECTION AIR, psi	1 1/8			
ASH BED THICKNESS, inches	3"			
Paint Fume Fan % O2	16.75	16.4		
Paint Fume Fan Temp	98°F			
COAL SCALE #1 x 200 lbs	272029	272103		
COAL SCALE #2 x 200 lbs	368493	368576		
TIME OF READING	2:29	6:42		

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 69,064
 Load, % 384
 Coal, lb/hr 7520

TEST NO.	3	3	3		
DESCRIPTION	low load subcritical				
COAL	Kent Coal				
DATE	11-18				
STEAM INTEGRATOR x 200 lbs.	762033	762604	783314		
TIME	0:20	12:00	14:13		
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	74	72	76	} 75,000	
RELATIVE AIR FLOW (green)	1.30	1.30	1.30		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	77	82	85	} 81,000	
DRUM LEVEL (red)	-1.0	-0.4	-0.6		
OXYGEN, % (green)	6.4	6.5	6.1		
SMOKE x 0.5 RINGLEMAN (blue)	3.4	3.37	3.35		
DRUM INDICATOR X 1 inch	-1.0	-0.5	-0.6		
ECON GAS IN, °F (red)	510	505	510		
ECON GAS OUT, °F (green)	310	307	307		
ECON WATER IN, °F (blue)	210	207	207		
ECON WATER OUT, °F (purple)	265	264	262		

KVB

TEST NO.	3	3	3		
STEAM HEADER PRESS, psig	187	188	186		
DRUM PRESSURE (black), psig	185	188	186		
FEEDWATER PRESS (red), psig	295	294	292		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	-.2	-.2	-.2		
FURNACE, "H ₂ O	-.11	-.11	-.11		
BOILER OUTLET, "H ₂ O	-.38	-.40	-.40		
ECONOMIZER OUTLET, "H ₂ O	-.20	-.20	-.20		
COLLECTOR OUTLET, "H ₂ O	-.30	-.30	-.29		
OVERFIRE AIR FRONT, "H ₂ O	28.5	28.5	28.5	✓	
OVERFIRE AIR REAR, "H ₂ O	26.5	26.0	25.5	✓	
<u>CONTROLS</u>					
FUEL FEED	35	37	38		
STEAM FLOW/AIR FLOW (AUX)	—	—	—		
F.D. DAMPER	40	40	40		
STEAM FLOW/AIR FLOW	52	50	53		
OVERFIRE AIR	58	60	60		
FURNACE DRAFT	30	30	30		
ID FAN AMPS	005	005	005		
FD FAN AMPS	15	15	15		

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 109,300
 Load, % 60.7
 Coal, lb/hr 13,803

TEST NO.	4	4	4	4	
DESCRIPTION	max load with part fans				
COAL	Kentucky				
DATE	11-20-78				
STEAM INTEGRATOR x 200 lbs.	806250	807004	807781	808456	
TIME	12:18	13:37	15:03	16:18	
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	118	117	10.5	} 110.00	
RELATIVE AIR FLOW (green)	1.65	1.65	1.65		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	125	125	115	} 121.000	
DRUM LEVEL (red)	-2.0	+0.8	0		
OXYGEN, % (green)	4.7	4.3	4.0		
SMOKE x 0.5 RINGLEMAN (blue)	3.0	2.9-2.7	2.0		
DRUM INDICATOR X 1 inch	-2.0	+1.8	0		
ECON GAS IN, °F (red)	612	607	602		
ECON GAS OUT, °F (green)	365	360	360		
ECON WATER IN, °F (blue)	217	218	218		
ECON WATER OUT, °F (purple)	277	277	277		

KVB

TEST NO.	4	4	4		
STEAM HEADER PRESS, psig	192	191	160		
DRUM PRESSURE (black), psig	200	202	200		
FEEDWATER PRESS (red), psig	245	240	240		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.8	0.9	0.9		
FURNACE, "H ₂ O	0.17	0.15	0.13		
BOILER OUTLET, "H ₂ O	0.95	0.90	0.90		
ECONOMIZER OUTLET, "H ₂ O	4.7	4.5	4.7		
COLLECTOR OUTLET, "H ₂ O	7.1	7.0	7.2		
OVERFIRE AIR FRONT, "H ₂ O	28.0	28.0	28.0		
OVERFIRE AIR REAR, "H ₂ O	29.0	30+	30+		
<u>CONTROLS</u>					
FUEL FEED	33	43	65		
STEAM FLOW/AIR FLOW (AUX) ^{50% pt} +100	65	65	65		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	68	72	72		
OVERFIRE AIR	65	75	95		
FURNACE DRAFT	60	60	60		
ID FAN AMPS	005	005	005		
FD FAN AMPS	-	-	-		

KVB

TEST NO.	4	4	4	
GRATE SPEED, REL.	20	20	20	
GRATE PRESSURE, PSIG	40	40	40	
GRATE #1 FEEDER LENGTH, REL.	22	22	22	
GRATE #2 FEEDER LENGTH, REL.	28	27	27	
GRATE #3 FEEDER LENGTH, REL.	30	30	30	
GRATE #4 FEEDER LENGTH, REL.	25	25	25	
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	1 1/8 psi / 1 3/16 psi			
REAR OVERFIRE AIR (upper/lower) "H ₂ O	1/8 psi / 1/8 psi			
REINJECTION AIR, "H ₂ O	1/8 psi			
ASH BED THICKNESS, inches	3-4"			
COAL SCALE #1 x 200 lbs	274606		274713	
COAL SCALE #2 x 200 lbs	371576		371677	
TIME OF READING	12 25		16 18	

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 92,332

Load, % 51.3

Coal, lb/hr 11,617

TEST NO.	5	5	5		
DESCRIPTION	low load with part fumes				
COAL	Kentucky	Industrial Mine			
DATE	11-21-78				
STEAM INTEGRATOR x 200 lbs.	820152	820846	821637		
TIME	12.56	14.25	16.11		
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	90	95	100		
RELATIVE AIR FLOW (green)	1.66	1.66	1.66		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	100	105	107		
DRUM LEVEL (red)	-1.2	-0.6	+1.2		
OXYGEN, % (green)	85	89	65		
SMOKE x 0.5 RINGLEMAN (blue)	35	35	2.0		
DRUM INDICATOR X 1 inch	-1.2	-0.6	+1.2		
ECON GAS IN, °F (red)	560	560	560		
ECON GAS OUT, °F (green)	360	355	355		
ECON WATER IN, °F (blue)	226	226	227		
ECON WATER OUT, °F (purple)	298	296	294		

KVB

TEST NO.	5	5	5		
STEAM HEADER PRESS, psig	189	189	190		
DRUM PRESSURE (black), psig	190	192	195		
FEEDWATER PRESS (red), psig	266	263	262		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	8.9	8.9	8.9		
FURNACE, "H ₂ O	-0.15	-0.09	-0.10		
BOILER OUTLET, "H ₂ O	-0.90	-0.80	-0.90		
ECONOMIZER OUTLET, "H ₂ O	-4.5	-4.2	-4.2		
COLLECTOR OUTLET, "H ₂ O	-7.0	-6.4	-6.3		
OVERFIRE AIR FRONT, "H ₂ O	28.0	28.0	28.0		
OVERFIRE AIR REAR, "H ₂ O	30+	30.0	30+		
<u>CONTROLS</u>					
FUEL FEED	60	40	45		
STEAM FLOW/AIR FLOW (AUX)	100+	85	95		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	64	62	62		
OVERFIRE AIR	85	65	80		
FURNACE DRAFT	60	55	65		
ID FAN AMPS	205	205	205		
FD FAN AMPS	-	-	-		

KVB

TEST NO.	5	5		
GRATE SPEED, REL.	26	26	32	
GRATE PRESSURE, PSIG	40	40	40	
GRATE #1 FEEDER LENGTH, REL.	30	27	30	
GRATE #2 FEEDER LENGTH, REL.	35	32	35	
GRATE #3 FEEDER LENGTH, REL.	35	32	35	
GRATE #4 FEEDER LENGTH, REL.	32	28	32	
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	1 1/8" / 1 3/8"			
REAR OVERFIRE AIR (upper/lower) "H ₂ O	3/4" / 1 1/8"			
REINJECTION AIR, "H ₂ O	1 3/4"			
ASH BED THICKNESS, inches	3'	3'		
COAL SCALE #1 x 200 lbs	275342		421	
COAL SCALE #2 x 200 lbs	372570		673	
TIME OF READING	17:04		16:12	

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 97,433

Load, % 54.1

Coal, lb/hr 12,557

TEST NO.	6				
DESCRIPTION	Dart Furnace low P.F.A.				
COAL	Industrial Mine (Kant Coal)				
DATE	12-12-78				
STEAM INTEGRATOR x 200 lbs.	978132	979970	979764		
TIME	14:00	15:40	17:21		
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	1.06	1.00	1.02		
RELATIVE AIR FLOW (green)	1.24	1.25	1.25		
STEAM TEMPERATURE, °F (blue)	432	431	431		
STEAM INDICATOR X 1000 lb/hr	110	106	107		
DRUM LEVEL (red)	-1.5	-0.5	-0.5		
OXYGEN, % (green)	4.0	4.2	4.5		
SMOKE x 0.5 RINGLEMAN (blue)	2.3	3.0 / 1.7	2.5		
DRUM INDICATOR X 1 inch	+2.0	+1.5	+1.5		
ECON GAS IN, °F (red)	580	580	580		
ECON GAS OUT, °F (green)	354	355	355		
ECON WATER IN, °F (blue)	280	205	206		
ECON WATER OUT, °F (purple)	266	270	270		

KVB

TEST NO.	6				
STEAM HEADER PRESS, psig	192	190	190		
DRUM PRESSURE (black), psig	198	196	193		
FEEDWATER PRESS (red), psig	294	275	279		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	+0.6	+0.8	+0.8		
FURNACE, "H ₂ O	-0.31	-0.050	-0.10		
BOILER OUTLET, "H ₂ O	-0.90	-0.85	-0.80		
ECONOMIZER OUTLET, "H ₂ O	-3.7	-3.6	-3.7		
COLLECTOR OUTLET, "H ₂ O	-6.0	-5.6	-6.0		
OVERFIRE AIR FRONT, "H ₂ O	28.0	28.0	28.0		
OVERFIRE AIR REAR, "H ₂ O	18.6	22.0	22.0		
<u>CONTROLS</u>					
FUEL FEED	70	70	70		
STEAM FLOW/AIR FLOW (AUX)	85	85	85		
F.D. DAMPER	—	—	—		
STEAM FLOW/AIR FLOW	60	60	60		
OVERFIRE AIR	50	60	60		
FURNACE DRAFT	50	50	50		
ID FAN AMPS	005	005	005		
FD FAN AMPS	—	—	—		

KVB

TEST NO.	6				
GRATE SPEED, REL.	25		25		
GRATE PRESSURE, PSIG	40		40		
GRATE #1 FEEDER LENGTH, REL.	23		23		
GRATE #2 FEEDER LENGTH, REL.	30		35		
GRATE #3 FEEDER LENGTH, REL.	30		30		
GRATE #4 FEEDER LENGTH, REL.	23		30		
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	1/4" / 1 1/8"				
REAR OVERFIRE AIR (upper/lower) "H ₂ O	1/8" / 1 1/16 psi				
REINJECTION AIR, "H ₂ O	1/8 psi				
ASH BED THICKNESS, inches	3"-4"	3"-4"	3'-4"		
	ash bed is clicking				
COAL SCALE #1 x 200 lbs	285643		6001	= 109	
COAL SCALE #2 x 200 lbs	387244		7920	= 86	
TIME OF READING	14:25		17:30		

KVB

NOTES

TEST NO: 6 - Boiler ran for about an hour with rear O.F.A. at 18.5" H ₂ O
due to smoke O.F.A. was raised to 20"
at 15.35 raised to 22"
TEST NO:
TEST NO:
TEST NO:

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 101,208
Load, % 56.2
Coal, lb/hr 13,385

TEST NO.	7	7	7		
DESCRIPTION	vary OPA Paint Furnace	high vpm rear OPA			
COAL	Keok. Industrial				
DATE	12-14-78				
STEAM INTEGRATOR x 200 lbs.	980370	978955	978214	977165	
TIME	11:15	14:05	15:36	17:37	
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	.97	1.02	.92		
RELATIVE AIR FLOW (green)	1.25	1.26	1.25		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	104	110	101		
DRUM LEVEL (red)	-1.5	-1.0	-1.0		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	4.6	4.4	4.5		
DRUM INDICATOR X 1 inch	+0.8	+1.0	+1.0		
ECON GAS IN, °F (red)	580	578	581		
ECON GAS OUT, °F (green)	360	361	360		
ECON WATER IN, °F (blue)	210	211	211		
ECON WATER OUT, °F (purple)	267	260	266		
	gaseous in truck broke never finished				

KVB

TEST NO.	7	7	7		
STEAM HEADER PRESS, psig	190	190	189		
DRUM PRESSURE (black), psig	198	201	194		
FEEDWATER PRESS (red), psig	270	280	280		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.8	0.8	0.9		
FURNACE, "H ₂ O	-0.15	-0.13	-0.17		
BOILER OUTLET, "H ₂ O	-0.8	-0.9	-0.7		
ECONOMIZER OUTLET, "H ₂ O	-3.8	-4.0	-4.0		
COLLECTOR OUTLET, "H ₂ O	-5.8	-6.0	-6.1		
OVERFIRE AIR FRONT, "H ₂ O	28.0	26.0	26.0		
OVERFIRE AIR REAR, "H ₂ O	20.0	20.0	20.0		
<u>CONTROLS</u>					
FUEL FEED	75	60	100		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	60	60	60		
OVERFIRE AIR	45	45	50		
FURNACE DRAFT	45	45	50		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

KVB

TEST NO.	7	7	7		
GRATE SPEED, REL.		2.1	2.5		
GRATE PRESSURE, PSIG		40	40		
GRATE #1 FEEDER LENGTH, REL.		18	25		
GRATE #2 FEEDER LENGTH, REL.		25	27		
GRATE #3 FEEDER LENGTH, REL.		29	30		
GRATE #4 FEEDER LENGTH, REL.		20	32		
	pre test				
FRONT OVERFIRE AIR (upper/lower) "H ₂ O		1 psi / 1 1/2 psi			
REAR OVERFIRE AIR (upper/lower) "H ₂ O	1/8 / 1 1/4 psi	1 psi / 1 1/4 psi			
REINJECTION AIR, "H ₂ O	1 1/8 psi	1 1/8 psi			
ASH BED THICKNESS, inches		3"			
			*4 feeders picked up		
Temp. Flue gas	91°				
RH, %	32				
COAL SCALE #1 x 200 lbs	287008	287120	= 112		
COAL SCALE #2 x 200 lbs	388614	38739	= 120		
TIME OF READING	14:07	17:35			

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 91,249
 Load, % 50.7
 Coal, lb/hr 11,663

TEST NO.	8	8	8		
DESCRIPTION	High O.F.A approx low air	with Point	Fumes		
COAL	Kentucky	(Industrial)			
DATE	12-15-78				
STEAM INTEGRATOR x 200 lbs.	979970	980617	981307	981468	
TIME	13:03	14:36	16:00	16:20	
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	0.90	0.95	1.00		
RELATIVE AIR FLOW (green)	1.27	1.27	1.27		
STEAM TEMPERATURE, °F (blue)	432	432	432		
STEAM INDICATOR X 1000 lb/hr	95	100	105		
DRUM LEVEL (red)	-1.5	-1.5	-1.5		
OXYGEN, % (green)	7.0	7.0	7.0		
SMOKE x 0.5 RINGLEMAN (blue)	3.8	3.8	3.8		
DRUM INDICATOR X 1 inch	+0.5	+0.1	+0.1		
ECON GAS IN, °F (red)	550	550	550		
ECON GAS OUT, °F (green)	360	360	360		
ECON WATER IN, °F (blue)	214	215	215		
ECON WATER OUT, °F (purple)	272	280	285		

KVB

TEST NO.	8	8	8		
STEAM HEADER PRESS, psig	189	190	190		
DRUM PRESSURE (black), psig	191	192	196		
FEEDWATER PRESS (red), psig	280	290	280		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.6	0.7	0.7		
FURNACE, "H ₂ O	-0.28	-0.15	-0.19		
BOILER OUTLET, "H ₂ O	-1.0	-0.8	-0.8		
ECONOMIZER OUTLET, "H ₂ O	-4.0	-3.7	-3.7		
COLLECTOR OUTLET, "H ₂ O	-6.4	-5.8	-5.6		
OVERFIRE AIR FRONT, "H ₂ O	25.0	25.0	25.5		
OVERFIRE AIR REAR, "H ₂ O	28.0	28.0	28.0		
<u>CONTROLS</u>					
FUEL FEED	75	75	70		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	55	55	55		
OVERFIRE AIR	80	80	80		
FURNACE DRAFT	55	50	50		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

KVB

TEST NO.	8	8	6		
GRATE SPEED, REL.	2.2	2.2	2.2		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	16	22	22		
GRATE #2 FEEDER LENGTH, REL.	26	25	26		
GRATE #3 FEEDER LENGTH, REL.	26	26	26		
GRATE #4 FEEDER LENGTH, REL.	20	21	23		
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	1 psi / 1 psi				
REAR OVERFIRE AIR (upper/lower) "H ₂ O	1 psi / 5/16 psi				
REINJECTION AIR, "H ₂ O	1 psi				
ASH BED THICKNESS, inches	2-3"				
Point Fan temp °F	91°				
RH	35%				
COAL SCALE #1 x 200 lbs	389405		389502	= 97	
COAL SCALE #2 x 200 lbs	287445		287611	= 76	
TIME OF READING	13.23		16.21		

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 85,015
 Load, % 47.2
 Coal, lb/hr 10875

TEST NO.	9	9	9		
DESCRIPTION	<i>W. River Point Dumma</i>				
COAL	<i>Kentucky Coal - Industrial Mine</i>				
DATE	<i>12-16-78</i>				
STEAM INTEGRATOR x 200 lbs.	<i>991066</i>	<i>991757</i>	<i>992327</i>	<i>992490</i>	
TIME	<i>13:05</i>	<i>2:47</i>	<i>16:03</i>	<i>6:26</i>	
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	<i>.85</i>	<i>.86</i>	<i>.90</i>		
RELATIVE AIR FLOW (green)	<i>1.18</i>	<i>1.2</i>	<i>1.20</i>		
STEAM TEMPERATURE, °F (blue)	<i>430</i>	<i>430</i>	<i>430</i>		
STEAM INDICATOR X 1000 lb/hr	<i>90</i>	<i>90</i>	<i>98</i>		
DRUM LEVEL (red)	<i>-0.5</i>	<i>-1.2</i>	<i>-1.3</i>		
OXYGEN, % (green)	<i>>10</i>	<i>>10</i>	<i>>10</i>		
SMOKE x 0.5 RINGLEMAN (blue)	<i>3.2</i>	<i>6.4</i>	<i>3.7</i>		
DRUM INDICATOR X 1 inch	<i>+1.5</i>	<i>+0.9</i>	<i>+0.8</i>		
ECON GAS IN, °F (red)	<i>540</i>	<i>545</i>	<i>545</i>		
ECON GAS OUT, °F (green)	<i>320</i>	<i>325</i>	<i>325</i>		
ECON WATER IN, °F (blue)	<i>178</i>	<i>180</i>	<i>180</i>		
ECON WATER OUT, °F (purple)	<i>242</i>	<i>240</i>	<i>240</i>		

KVB

TEST NO.	9	9	9		
STEAM HEADER PRESS, psig	188	189	189		
DRUM PRESSURE (black), psig	190	190	189		
FEEDWATER PRESS (red), psig	275	275	277		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.7	0.6	0.6		
FURNACE, "H ₂ O	-0.10	-0.06	-0.10		
BOILER OUTLET, "H ₂ O	-0.6	-0.6	-0.6		
ECONOMIZER OUTLET, "H ₂ O	-3.0	-3.0	-3.1		
COLLECTOR OUTLET, "H ₂ O	-4.6	-4.8	-4.8		
OVERFIRE AIR FRONT, "H ₂ O	28.0	28	28		
OVERFIRE AIR REAR, "H ₂ O	24	24	24		
<u>CONTROLS</u>					
FUEL FEED	60	65	65		
STEAM FLOW/AIR FLOW (AUX)	-	-	-		
F.D. DAMPER	55	55	55		
STEAM FLOW/AIR FLOW	50	52	50		
OVERFIRE AIR	55	58	55		
FURNACE DRAFT	40	40	40		
ID FAN AMPS	-	-	-		
FD FAN AMPS	15	15	15		

KVB

TEST NO.	9			
GRATE SPEED, REL.	26	2.6	26	
GRATE PRESSURE, PSIG	40	40	40	
GRATE #1 FEEDER LENGTH, REL.	18	20	20	
GRATE #2 FEEDER LENGTH, REL.	23	24	24	
GRATE #3 FEEDER LENGTH, REL.	26	27	27	
GRATE #4 FEEDER LENGTH, REL.	20	20	20	
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	1 ps _i / 1 ps _i			
REAR OVERFIRE AIR (upper/lower) "H ₂ O	1/2 ps _i / 1/16 ps _i			
REINJECTION AIR, "H ₂ O	1/8 ps _i			
ASH BED THICKNESS, inches	3"		3"	
COAL SCALE #1 x 200 lbs	390197		390294	- 97
COAL SCALE #2 x 200 lbs	288222		288299	: 77
TIME OF READING	13:15		16:27	

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 7750
 Load, % 90
 Coal, lb/hr 11620

TEST NO.	10	15	20	25	30
DESCRIPTION	11/11/75	11/11/75		11/11/75	11/11/75
COAL	40000				
DATE	11-17-75				
STEAM INTEGRATOR x 200 lbs.	613	1.2			2.3
TIME	10:35	11:00		11:30	12:00
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	1.00	0.9		0.8	
RELATIVE AIR FLOW (green)	1.22	1.0		1.10	
STEAM TEMPERATURE, °F (blue)	470	470		470	
STEAM INDICATOR X 1000 lb/hr	1.0	0.9		0.8	
DRUM LEVEL (red)	-2		-1	-1.5	
OXYGEN, % (green)	20.0		20.0	20.0	
SMOKE x 0.5 RINGLEMAN (blue)	2.0		2.5	2.5	
DRUM INDICATOR X 1 inch	1.2		1.0	1.0	
ECON GAS IN, °F (red)	590		585	580	
ECON GAS OUT, °F (green)	500		500	500	
ECON WATER IN, °F (blue)	210	215		210	
ECON WATER OUT, °F (purple)	210	210		210	

KVB

TEST NO.	10				
STEAM HEADER PRESS, psig	190	190			
DRUM PRESSURE (black), psig	200	195			
FEEDWATER PRESS (red), psig	270	265			
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	1	0.8	0.8	0.8	
FURNACE, "H ₂ O	-1.15	-0.04	-1.15	-1.15	
BOILER OUTLET, "H ₂ O	-0.8	-0.8	-0.8	-0.85	
ECONOMIZER OUTLET, "H ₂ O	-4.1	-4.0	-4.2	-4.3	
COLLECTOR OUTLET, "H ₂ O	-6.1	-6	-6.2	-6.4	
OVERFIRE AIR FRONT, "H ₂ O	28	28	28	27	
OVERFIRE AIR REAR, "H ₂ O	26	26	230	13	
<u>CONTROLS</u>					
FUEL FEED	60	60	60	60	
STEAM FLOW/AIR FLOW (AUX)	6	6	6	6	
F.D. DAMPER	62	30	30	30	
STEAM FLOW/AIR FLOW	58	58	58	59	
OVERFIRE AIR	60	60	72	40	
FURNACE DRAFT	19	14	18	20	
ID FAN AMPS	—				
FD FAN AMPS	16.5	16.5	16.5	16.5	

KVB

TEST NO.	10				
GRATE SPEED, REL.	4/	1/		1/3	
GRATE PRESSURE, PSIG	24	210		40	
GRATE #1 FEEDER LENGTH, REL.	3-1	3-1		20	
GRATE #2 FEEDER LENGTH, REL.	28	28		28	
GRATE #3 FEEDER LENGTH, REL.	26	26		26	
GRATE #4 FEEDER LENGTH, REL.	25	25		23	
FRONT OVERFIRE AIR (upper/lower) "H ₂ O			1 2/10	1 2/10	
REAR OVERFIRE AIR (upper/lower) "H ₂ O			2 1/10 2 1/10	1 1/10 1 1/10	
REINJECTION AIR, "H ₂ O		1 2/10		1 2/10	
ASH BED THICKNESS, inches			3	4/	
COAL SCALE #1 x 200 lbs					
COAL SCALE #2 x 200 lbs					
TIME OF READING					

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 93,447 ¹/_{hr}
 Load, % 519 %
 Coal, lb/hr 12,210 ¹/_{hr}

TEST NO.	11	11	11		
DESCRIPTION	low OPA				
COAL	KENTUCKY	INDUSTRIAL			
DATE	12-18-78				
STEAM INTEGRATOR x 200 lbs.	012942	013584	014321	014773	
TIME	13:35	14:58	16:32	17:30	
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	0.98	0.96	0.94		
RELATIVE AIR FLOW (green)	1.25	1.25	1.25		
STEAM TEMPERATURE, °F (blue)	430	430	431		
STEAM INDICATOR X 1000 lb/hr	103	103	100		
DRUM LEVEL (red)	-1.5	-1.7	-2.0		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	4.7	4.6	4.5		
DRUM INDICATOR X 1 inch	+0.6	+0.4	0		
ECON GAS IN, °F (red)	550	555	565		
ECON GAS OUT, °F (green)	355	359	360		
ECON WATER IN, °F (blue)	214	215	216		
ECON WATER OUT, °F (purple)	270	272	266		

KVB

TEST NO.	11	11	11		
STEAM HEADER PRESS, psig	190	190	190		
DRUM PRESSURE (black), psig	192	195	195		
FEEDWATER PRESS (red), psig	270	260	262		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.8	0.9	1.0		
FURNACE, "H ₂ O	-.23	-.20	-.15		
BOILER OUTLET, "H ₂ O	-.85	-.80	-0.80		
ECONOMIZER OUTLET, "H ₂ O	-3.8	-3.7	-3.7		
COLLECTOR OUTLET, "H ₂ O	-5.8	-5.7	-5.7		
OVERFIRE AIR FRONT, "H ₂ O	28.0	28.0	28.5		
OVERFIRE AIR REAR, "H ₂ O	5.0	5.1	5.0		
<u>CONTROLS</u>					
FUEL FEED	87	80	95		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	58	58	56		
OVERFIRE AIR	30	30	30		
FURNACE DRAFT	50	50	50		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

KVB

TEST NO.	11	11	11		
GRATE SPEED, REL.	2.5	2.5	2.5		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	25	25	23		
GRATE #2 FEEDER LENGTH, REL.	27	27	29		
GRATE #3 FEEDER LENGTH, REL.	27	27	30		
GRATE #4 FEEDER LENGTH, REL.	23	23	25		
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	1 ps / 1 ps				
REAR OVERFIRE AIR (upper/lower) "H ₂ O	1/8 ps / 1/8 ps				
REINJECTION AIR, "H ₂ O	1/16 ps				
ASH BED THICKNESS, inches	3"	3"	3"		
COAL SCALE #1 x 200 lbs	572		673	101	
COAL SCALE #2 x 200 lbs	748		879	131	
TIME OF READING	13:42		17:30		

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 98,031
 Load, % 54.5
 Coal, lb/hr 12,963

TEST NO.	12			
DESCRIPTION	med. load print fines			
COAL	Crushed			
DATE	12-20-78			
STEAM INTEGRATOR x 200 lbs.	033408	034074	034514	034999
TIME	9:30	10:45	10:45	12:45
<u>CHART RECORDERS</u>				
STEAM FLOW X 100,000 lbs/hr (red)	1.00	1.05	1.02	
RELATIVE AIR FLOW (green)	1.26	1.26	1.26	
STEAM TEMPERATURE, °F (blue)	430	430	430	
STEAM INDICATOR X 1000 lb/hr	107	112	110	
DRUM LEVEL (red)	-1.5	-2.0	-1.8	
OXYGEN, % (green)	>10	>10	>10	
SMOKE x 0.5 RINGLEMAN (blue)	5.8/3.0	3.3	3.5	
DRUM INDICATOR X 1 inch	+1.6	+1.2	+1.4	
ECON GAS IN, °F (red)	565	582	582	
ECON GAS OUT, °F (green)	352	355	356	
ECON WATER IN, °F (blue)	212	212	212	
ECON WATER OUT, °F (purple)	266	265	265	

KVB

TEST NO.	12	12	12		
		12			
STEAM HEADER PRESS, psig	190	190	190		
DRUM PRESSURE (black), psig	195	200	199		
FEEDWATER PRESS (red), psig	210	267	268		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.9	0.9	0.8		
FURNACE, "H ₂ O	-0.10	-0.08	-0.15		
BOILER OUTLET, "H ₂ O	-0.7	-0.7	-0.9		
ECONOMIZER OUTLET, "H ₂ O	-3.8	-3.8	-4.0		
COLLECTOR OUTLET, "H ₂ O	-6.0	-6.0	-6.4		
OVERFIRE AIR FRONT, "H ₂ O	27.0	27.0	27.0		
OVERFIRE AIR REAR, "H ₂ O	25.0	25.0	25.0		
<u>CONTROLS</u>					
FUEL FEED	80	77	70		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	60	60	60		
OVERFIRE AIR	60	60	60		
FURNACE DRAFT	50	50	50		
ID FAN AMPS	-		-		
FD FAN AMPS	-		-		

KVB

TEST NO.	12	12		
GRATE SPEED, REL.	36	7.6	30	
GRATE PRESSURE, PSIG	40	40	40	
GRATE #1 FEEDER LENGTH, REL.	33	33	30	
GRATE #2 FEEDER LENGTH, REL.	32	32	27	
GRATE #3 FEEDER LENGTH, REL.	32	33	27	
GRATE #4 FEEDER LENGTH, REL.	30	30	26	
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	1 psi / 1 psi			
REAR OVERFIRE AIR (upper/lower) "H ₂ O	1/8 psi / 13/16 psi			
REINJECTION AIR, "H ₂ O	1 psi			
ASH BED THICKNESS, inches	3"			
<i>Paint Fan Temp</i>	91°F			
<i>RH</i>	36%			
COAL SCALE #1 x 200 lbs	324	393	= 109	
COAL SCALE #2 x 200 lbs	768	861	= 93	
TIME OF READING	9:36	12:43		

KVB

NOTES

TEST NO:	Boiler #1	614522	at 9:35	2	
		616052	at 12:41	2	97,143
					9.29 ^{16 steam} / _{16 coal} on boiler #1
	cool water	341	462	2	10,460
		524	616	2	10,460
		at 9:36	12:43		
TEST NO:					
TEST NO:					
TEST NO:					
TEST NO:					

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 72,000
 Load, % 40.0%
 Coal, lb/hr 9413

TEST NO.	13	13	13		
DESCRIPTION	low load with part flame				
COAL	crushed				
DATE	12-20-28				
STEAM INTEGRATOR x 200 lbs.	035684	036130	034224	36733	
TIME	14:21	17:32	16:28	17:15	
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	0.77	0.72	0.70		
RELATIVE AIR FLOW (green)	1.27	1.25	1.25		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	85	81	80		
DRUM LEVEL (red)	-1.8	-1.8	-1.9		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	4.5	5.5	5.5		
DRUM INDICATOR X 1 inch	+4	+4	+4		
ECON GAS IN, °F (red)	560	545	535		
ECON GAS OUT, °F (green)	350	350	348		
ECON WATER IN, °F (blue)	212	212	212		
ECON WATER OUT, °F (purple)	272	275	278		

KVB

TEST NO.	13	13	13		
STEAM HEADER PRESS, psig	189	189	189		
DRUM PRESSURE (black), psig	190	186	190		
FEEDWATER PRESS (red), psig	265	266	278		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.8	0.9	1.8		
FURNACE, "H ₂ O	-1.5	-1.3	-1.5		
BOILER OUTLET, "H ₂ O	-0.85	-0.75	-0.75		
ECONOMIZER OUTLET, "H ₂ O	-4.0	-3.6	-3.6		
COLLECTOR OUTLET, "H ₂ O	-6.2	-5.6	-5.5		
OVERFIRE AIR FRONT, "H ₂ O	27.0	27.0	27.0		
OVERFIRE AIR REAR, "H ₂ O	25.0	25.0	25.0		
<u>CONTROLS</u>					
FUEL FEED	45	45	50		
STEAM FLOW/AIR FLOW (AUX)	95	95	95		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	50	48	45		
OVERFIRE AIR	60	60	60		
FURNACE DRAFT	55	50	50		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

KVB

TEST NO.	13	13	13		
GRATE SPEED, REL.	20	20	20		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	26	26	26		
GRATE #2 FEEDER LENGTH, REL.	24	25	25		
GRATE #3 FEEDER LENGTH, REL.	25	26	26		
GRATE #4 FEEDER LENGTH, REL.	23	24	24		
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	17psi / 17psi				
REAR OVERFIRE AIR (upper/lower) "H ₂ O	13psi / 13psi				
REINJECTION AIR, "H ₂ O	17psi				
ASH BED THICKNESS, inches	3"				
COAL SCALE #1 x 200 lbs	448		515	=	67
COAL SCALE #2 x 200 lbs	901		971	=	60
TIME OF READING	2:27		17:14		

KVB

NOTES

TEST NO:	Boiler #1	CONV. SERVICE		
	2:27	496 - 684	18:15 567 - 746	- 9143 ⁱⁿ /hr
	steam	(14.5) 616890	618950 5:15	106,182 ⁱⁿ /hr
		forgot to write down price		
TEST NO:	13 - water level had held steady all day until 16:00			
	when it went from -1.8 to -5.0 up to +2.0			
	it took about 15 to 20 minutes to level off			
TEST NO:				
TEST NO:				
TEST NO:				

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 105,858
 Load, % 57.1
 Coal, lb/hr 14,165

TEST NO.	14			
DESCRIPTION	high load plant finish			
COAL	Crushed			
DATE	12-20-78			
STEAM INTEGRATOR x 200 lbs.	38094	38705	39328	39749
TIME	807	928	1031	1126
<u>CHART RECORDERS</u>				
STEAM FLOW X 100,000 lbs/hr (red)	1.12	1.10	1.10	
RELATIVE AIR FLOW (green)	1.27	1.29	1.28	
STEAM TEMPERATURE, °F (blue)	431	430	430	
STEAM INDICATOR X 1000 lb/hr	120	120	120	
DRUM LEVEL (red)	-2.2	-2.5	-2.6	
OXYGEN, % (green)	8.8	8.3	8.6	
SMOKE x 0.5 RINGLEMAN (blue)	5.2	5.1	7	
DRUM INDICATOR X 1 inch	-1.2	-1.4	-1	
ECON GAS IN, °F (red)	580	590	600	
ECON GAS OUT, °F (green)	357	360	363	
ECON WATER IN, °F (blue)	216	215	215	
ECON WATER OUT, °F (purple)	264	267	267	

KVB

TEST NO.	14	14	14		
STEAM HEADER PRESS, psig	190	191	190		
DRUM PRESSURE (black), psig	201	200	203		
FEEDWATER PRESS (red), psig	257	270	254		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.9	0.7	0.6		
FURNACE, "H ₂ O	-107	-15	-10		
BOILER OUTLET, "H ₂ O	-80	-80	-85		
ECONOMIZER OUTLET, "H ₂ O	-3.8	-3.9	-4.2		
COLLECTOR OUTLET, "H ₂ O	-5.8	-6.0	-6.4		
OVERFIRE AIR FRONT, "H ₂ O	27.0	27.0	27		
OVERFIRE AIR REAR, "H ₂ O	25.0	25.0	25		
<u>CONTROLS</u>					
FUEL FEED	87	87	100		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	65	60	65		
OVERFIRE AIR	60	60	60		
FURNACE DRAFT	50	55	55		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

KVB

TEST NO.	14			
GRATE SPEED, REL.	3.5	3.5	3.5	
GRATE PRESSURE, PSIG	40	40	40	
GRATE #1 FEEDER LENGTH, REL.	33	33	37	
GRATE #2 FEEDER LENGTH, REL.	30	31	32	
GRATE #3 FEEDER LENGTH, REL.	28	29	30	
GRATE #4 FEEDER LENGTH, REL.	30	29	31	
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	1psi / 1psi			
REAR OVERFIRE AIR (upper/lower) "H ₂ O	1/8 / 1/16 psi			
REINJECTION AIR, "H ₂ O	1/2 psi			
ASH BED THICKNESS, inches	3"			
Paint Fan temp	93°F			
RH	34%			
COAL SCALE #1 x 200 lbs	64	724	= 113	
COAL SCALE #2 x 200 lbs	62	178	= 116	
TIME OF READING	8:00	11:24		

KVB

NOTES

Prills of steam

TEST NO:

8:10 - 619482

620709

11.26

75,122 ¹⁶⁵/_{hr}

~~818~~

817

877

11:24

80695 ¹⁶⁵/_{hr}

621

682

9.72 ¹⁶⁵/_{hr}

TEST NO:

TEST NO:

TEST NO:

TEST NO:

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 104,848

Load, % 58.2%

Coal, lb/hr 16,043 25T

TEST NO.	15	15	15		
DESCRIPTION	<i>Normal O.F.A.</i>				
	<i>4.2</i>				
COAL	<i>EASTERN KENT.</i>				
	<i>25 coal</i>				
DATE	<i>1-5-78</i>				
STEAM INTEGRATOR x 200 lbs.	<i>141890</i>	<i>142682</i>	<i>143304</i>	<i>143620</i>	
TIME	<i>9:42</i>	<i>11:12</i>	<i>12:25</i>	<i>13:01</i>	
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	<i>1.15</i>	<i>1.03</i>	<i>1.09</i>		
RELATIVE AIR FLOW (green)	<i>1.27</i>	<i>1.27</i>	<i>1.27</i>		
STEAM TEMPERATURE, °F (blue)	<i>430</i>	<i>430</i>	<i>430</i>		
STEAM INDICATOR X 1000 lb/hr	<i>120</i>	<i>110</i>	<i>114</i>		
DRUM LEVEL (red)	<i>-2.6</i>	<i>-2.6</i>	<i>-2.8</i>		
OXYGEN, % (green)	<i>>10</i>	<i>>10</i>	<i>>10</i>		
SMOKE x 0.5 RINGLEMAN (blue)	<i>3.3</i>	<i>3.8</i>	<i>4.2</i>		
DRUM INDICATOR X 1 inch	<i>-.6</i>	<i>-.4</i>	<i>-.6</i>		
ECON GAS IN, °F (red)	<i>600</i>	<i>602</i>	<i>605</i>		
ECON GAS OUT, °F (green)	<i>370</i>	<i>371</i>	<i>372</i>		
ECON WATER IN, °F (blue)	<i>220</i>	<i>224</i>	<i>220</i>		
ECON WATER OUT, °F (purple)	<i>263</i>	<i>270</i>	<i>273</i>		

KVB

TEST NO.	15			
STEAM HEADER PRESS, psig	188	190	194	
DRUM PRESSURE (black), psig	196	201	205	
FEEDWATER PRESS (red), psig	273	273	278	
<u>DRAFT GAUGES</u>				
WINDBOX, "H ₂ O	10	09	10	
FURNACE, "H ₂ O	-0.10	-0.12	-0.17	
BOILER OUTLET, "H ₂ O	-45	-45	-10	
ECONOMIZER OUTLET, "H ₂ O	-47	-47	-49	
COLLECTOR OUTLET, "H ₂ O	-76	-72	-76	
OVERFIRE AIR FRONT, "H ₂ O	28	28	28	
OVERFIRE AIR REAR, "H ₂ O	26	26	26	
<u>CONTROLS</u>				
FUEL FEED	80	87	80	
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+	
F.D. DAMPER	-	-	-	
STEAM FLOW/AIR FLOW	64	62	63	
OVERFIRE AIR	60	60	60	
FURNACE DRAFT	60	60	60	
ID FAN AMPS	-	-	-	
FD FAN AMPS	-	-	-	

KVB

TEST NO.	15	15		
GRATE SPEED, REL.	29	32		
GRATE PRESSURE, PSIG	40	40		
GRATE #1 FEEDER LENGTH, REL.	26	29	28	
GRATE #2 FEEDER LENGTH, REL.	28	32	31	
GRATE #3 FEEDER LENGTH, REL.	24	25	25	
GRATE #4 FEEDER LENGTH, REL.	21	24	23	
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	1 ps / 1 ps			
REAR OVERFIRE AIR (upper/lower) "H ₂ O	1/8 ps / 1/16 ps			
REINJECTION AIR, "H ₂ O	1/16 ps			
ASH BED THICKNESS, inches	left to right 5" - 5" or clinkers	3" - 5"	3" - 5"	#3 down-clinkers
TEMP (PAINT AIR FAN) °F	90°F			
Relative Humidity %	32%			
COAL SCALE #1 x 200 lbs	293737	cool scales is being bypassed	115 ST	
COAL SCALE #2 x 200 lbs	307451	40086	- 135	
TIME OF READING	9:55	13:02		

KVB

NOTES

TEST NO:

15 - coal seams to be oil enriched

fuel oil smell in coal and burning fuel oil smell by control panel

TEST NO:

TEST NO:

TEST NO:

TEST NO:

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 93,494
 Load, % 579
 Coal, lb/hr 14,054

TEST NO.	16	16	16	16	
DESCRIPTION	SASS and	SOX			
COAL	Eastern Kent				
DATE	1-8-79				
STEAM INTEGRATOR x 200 lbs.	169400	170479	171347	172049	
TIME	12.14	14.26	16.21	17.54	
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	1.00	1.00	0.90	0.90	
RELATIVE AIR FLOW (green)	1.27	1.27	1.27		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	106	108	97		
DRUM LEVEL (red)	-3.0	-2.5	-4.0		
OXYGEN, % (green)	7.2	6.8	8.0		
SMOKE x 0.5 RINGLEMAN (blue)	2.9	3.2	3.3		
DRUM INDICATOR X 1 inch	-0.8	-1.0	-1.6		
ECON GAS IN, °F (red)	587	592	590		
ECON GAS OUT, °F (green)	361	363	365		
ECON WATER IN, °F (blue)	220	223	225		
ECON WATER OUT, °F (purple)	265	270	274		

KVB

TEST NO.	16	16	16		
STEAM HEADER PRESS, psig	190	190	190		
DRUM PRESSURE (black), psig	197	199	196		
FEEDWATER PRESS (red), psig	278	284	280		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.9	0.8	0.8		
FURNACE, "H ₂ O	-1.0	-1.22	-1.18		
BOILER OUTLET, "H ₂ O	-1.0	-0.9	-0.85		
ECONOMIZER OUTLET, "H ₂ O	-4.1	-4.1	-4.1		
COLLECTOR OUTLET, "H ₂ O	-6.4	-6.2	-6.4		
OVERFIRE AIR FRONT, "H ₂ O	27	27	27		
OVERFIRE AIR REAR, "H ₂ O	22	22	22		
<u>CONTROLS</u>					
FUEL FEED	62	60	90		
STEAM FLOW/AIR FLOW (AUX)	70	70	70		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	60	60	55		
OVERFIRE AIR	55	55	55		
FURNACE DRAFT	50	57	59		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

KVB

NOTES

TEST NO: 16

Lead down to 90 KHz per sec to shift back at 16.00 to 17.00

TEST NO:

TEST NO:

TEST NO:

TEST NO:

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 92,667
 Load, % 57.5
 Coal, lb/hr 16,207

TEST NO.	17			
DESCRIPTION	SASS			
COAL	Kent			
DATE	1-10-79			
STEAM INTEGRATOR x 200 lbs.	190345	191145	192035	192430
TIME	10:25	12:11	14:09	14:55
<u>CHART RECORDERS</u>				
STEAM FLOW X 100,000 lbs/hr (red)	0.98	0.92	0.94	
RELATIVE AIR FLOW (green)	1.27	1.27	1.27	
STEAM TEMPERATURE, °F (blue)	430	430	430	
STEAM INDICATOR X 1000 lb/hr	105	99	101	
DRUM LEVEL (red)	-2.4	-2.8	-3.6	
OXYGEN, % (green)	6.4	8.2	6.7	
SMOKE x 0.5 RINGLEMAN (blue)	4.5	5.0	5.0	
DRUM INDICATOR X 1 inch	-1.2	-1.6	-1.4	
ECON GAS IN, °F (red)	600	590	592	
ECON GAS OUT, °F (green)	360	360	357	
ECON WATER IN, °F (blue)	221	224	223	
ECON WATER OUT, °F (purple)	266	274	270	

KVB

TEST NO.	17	17	17		
STEAM HEADER PRESS, psig	192	192	192		
DRUM PRESSURE (black), psig	203	200	201		
FEEDWATER PRESS (red), psig	284	285	285		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.9	0.9	0.9		
FURNACE, "H ₂ O	-0.27	-0.30	-0.29		
BOILER OUTLET, "H ₂ O	-1.0	-1.1	-1.1		
ECONOMIZER OUTLET, "H ₂ O	-4.5	-4.5	-4.4		
COLLECTOR OUTLET, "H ₂ O	-6.4	-6.8	-6.8		
OVERFIRE AIR FRONT, "H ₂ O	28.0	28.0	28.0		
OVERFIRE AIR REAR, "H ₂ O	23.0	22.5	23.0		
<u>CONTROLS</u>					
FUEL FEED	60	60	61		
STEAM FLOW/AIR FLOW (AUX)	80	83	83		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	58	55	55		
OVERFIRE AIR	57	57	55		
FURNACE DRAFT	58	57	55		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

KVB

TEST NO.	17	17	17		
GRATE SPEED, REL.	20	20	20		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	22	22	23		
GRATE #2 FEEDER LENGTH, REL.	23	23	24		
GRATE #3 FEEDER LENGTH, REL.	26	26	27		
GRATE #4 FEEDER LENGTH, REL.	24	24	26		
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	28"/28"				
REAR OVERFIRE AIR (upper/lower) "H ₂ O	9"/23"				
REINJECTION AIR, "H ₂ O	30"				
ASH BED THICKNESS, inches	7"		3"		
COAL SCALE #1 x 200 lbs	293727	does not dump		180 est	
COAL SCALE #2 x 200 lbs	409716		403902	186	
TIME OF READING	10.29		1500		

KVB

ABMA TEST SITE E
 BOILER NO. 2
 CONTROL ROOM DATA SHEET

Steam, lb/hr 97,808
 Load, % 543
 Coal, lb/hr ~~755~~ EST

TEST NO.	18			12203
DESCRIPTION	Vavy Dr			
COAL	Kent			
DATE	1-12-79			
STEAM INTEGRATOR x 200 lbs.	212155			212750
TIME	9:42			10:55
<u>CHART RECORDERS</u>				
STEAM FLOW X 100,000 lbs/hr (red)	100	101	96	100
RELATIVE AIR FLOW (green)	1.27		1.28	1.28
STEAM TEMPERATURE, °F (blue)	430			
STEAM INDICATOR X 1000 lb/hr	106	107	103	107
DRUM LEVEL (red)	-2.6	-2.6	-2.6	-3.0
OXYGEN, % (green)	5.3	4.8	6.0	6.3
SMOKE x 0.5 RINGLEMAN (blue)	3.2			3.5
DRUM INDICATOR X 1 inch	-1.6	-1.6	-1.6	-1.0
ECON GAS IN, °F (red)	587			
ECON GAS OUT, °F (green)	557			
ECON WATER IN, °F (blue)	221			
ECON WATER OUT, °F (purple)	267			

KVB

TEST NO.	18				
STEAM HEADER PRESS, psig	192				
DRUM PRESSURE (black), psig	201				
FEEDWATER PRESS (red), psig	288				
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.8	0.8	0.8	0.8	
FURNACE, "H ₂ O	-2.3	-2.8	-2.8	-2.4	
BOILER OUTLET, "H ₂ O	-0.8	-0.9	-0.9	-0.9	
ECONOMIZER OUTLET, "H ₂ O	-4.0	-4.2	-4.2	-4.2	
COLLECTOR OUTLET, "H ₂ O	-5.9	-6.1	-6.4	-6.4	
OVERFIRE AIR FRONT, "H ₂ O	27.0			27.0	
OVERFIRE AIR REAR, "H ₂ O	24.5			24.5	
<u>CONTROLS</u>					
FUEL FEED	60			65	
STEAM FLOW/AIR FLOW (AUX)	80	85	100	80	
F.D. DAMPER	-			-	
STEAM FLOW/AIR FLOW	58				
OVERFIRE AIR	60				
FURNACE DRAFT	50				
ID FAN AMPS	-				
FD FAN AMPS	-				

KVB

TEST NO.	18			
GRATE SPEED, REL.	2.6			
GRATE PRESSURE, PSIG	40			
GRATE #1 FEEDER LENGTH, REL.	18			
GRATE #2 FEEDER LENGTH, REL.	24			
GRATE #3 FEEDER LENGTH, REL.	26			
GRATE #4 FEEDER LENGTH, REL.	18			
FRONT OVERFIRE AIR (upper/lower) "H ₂ O	28"/28"			
REAR OVERFIRE AIR (upper/lower) "H ₂ O	20"/25"			
REINJECTION AIR, "H ₂ O	30'			
ASH BED THICKNESS, inches	3'			
COAL SCALE #1 x 200 lbs	727	out of order		
COAL SCALE #2 x 200 lbs	529	out of order		
TIME OF READING	9:46	10:58		

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 95072

Load, % 52.8

Coal, lb/hr 13720 est

TEST NO.	20				
DESCRIPTION	max load reg air				
COAL	Kwt				
DATE	1-19-79				
STEAM INTEGRATOR x 200 lbs.	278733	279329	279960	280270	
TIME	2:21	3:34	4:56	5:35	
<u>CHART RECORDERS</u>					
STEAM FLOW X 100,000 lbs/hr (red)	1.06	1.04	1.05		
RELATIVE AIR FLOW (green)	1.28	1.28	1.28		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	-	-	-		
DRUM LEVEL (red)	-4.8	-2.6	-3.2		
OXYGEN, % (green)	>10	710	>10		
SMOKE x 0.5 RINGLEMAN (blue)	4.0	4.5	4.5		
DRUM INDICATOR X 1 inch	-1.6	+1.4	-1.3		
ECON GAS IN, °F (red)	585	581	582		
ECON GAS OUT, °F (green)	358	360	366		
ECON WATER IN, °F (blue)	217	217	216		
ECON WATER OUT, °F (purple)	265	276	265		

KVB

TEST NO.	20	20			
STEAM HEADER PRESS, psig	190	189	190		
DRUM PRESSURE (black), psig	197	190	191		
FEEDWATER PRESS (red), psig	283	277	279		
<u>DRAFT GAUGES</u>					
WINDBOX, "H ₂ O	0.8	0.8	0.8		
FURNACE, "H ₂ O	-2.5	-2.1	-2.2		
BOILER OUTLET, "H ₂ O	-1.0	-1.0	-1.1		
ECONOMIZER OUTLET, "H ₂ O	-4.4	-4.8	-4.8		
COLLECTOR OUTLET, "H ₂ O	-6.2	-6.8	-7.2		
OVERFIRE AIR FRONT, "H ₂ O	28	28	28		
OVERFIRE AIR REAR, "H ₂ O	26	24	26		
<u>CONTROLS</u>					
FUEL FEED	75	72	80		
STEAM FLOW/AIR FLOW (AUX)	85	90	80		
F.D. DAMPER	-	-			
STEAM FLOW/AIR FLOW	58	58	58		
OVERFIRE AIR	60	60	60		
FURNACE DRAFT	50	50	50		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

KVB

NOTES

TEST NO: 20 coal flow in kg/hr estimated due to both scales being bypassed.

Tests 7 & 17 were taken at the same as test 20, so an average of these 2 tests is used $13,720 \text{ kg/hr}$

TEST NO:

TEST NO:

TEST NO:

TEST NO:

SECTION 2.0

PARTICULATE DATA

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2.3 PARTICULATE LAB WORKSHEETS	100

PARTICULATE DATA SUMMARY

PART I

BLROUT- 5'7"x17'8"=98.64

ECONOUT-4'2"x17'8"=73.61

Stack- 5'6"x7'=38.50

LOCATION: ABMA TEST SITE E

TEST NO.	Total Mass mgm.	Dry Gas Volume ft ³	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H ₂ O	Pitot ΔP "H ₂ O	Orifice ΔH "H ₂ O	Stack Gas Temp. °R	Excess O ₂ %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10 ⁶ BTU	Flue Gas MW g/g mole
5 BLR	7954.9	52.04	75	29.75	-0.8	0.053	0.94	982	9.9	72	0.505	0.837	965	29.19
5 MECH	388.0	57.989 ^{20.94}	81	29.75	+2.6	1.88 ^{0.33}	0.52	790	9.7	30/75	0.187 ^{0.246}	0.837	965	29.21
6 BLR	3249.9	53.200	87	29.29	-0.8	0.054	1.01	972	7.6	72	0.505	0.837	9564	29.51
6 MECH	497.6	53.777 ^{18.376}	80	29.29	+1.5	2.29 ^{1.615}	0.38	788	8.1	85/50	2.22 ^{1.87}	0.837	9564	29.51
7 BLR	10,835.7	59.97	89	29.20	-0.8	0.07	1.3	955	6.2	72	0.505	0.837	9662	29.60
7 MECH	3230.4	19.189 ^{38.531}	82	29.20	+2.0	1.56 ^{2.272}	0.42	786	7.0	30/85	1.87 ^{2.46}	0.837	9662	29.46
8 BLR	7299.9	52.61	78.5	29.00	-0.8	0.059	1.10	965	6.8	72	0.505	0.837	9641	29.44
8 MECH	289.4	32.935 ^{18.337}	71	29.00	+2.2	2.23 ^{1.46}	0.36	768	7.5	80/30	2.46 ^{1.87}	0.837	9641	29.45
9 BLR	6109.6	53.22	70.5	29.00	-0.8	0.06	0.91	946	7.7	72	0.505	0.837	9670	29.42
9 MECH	857.9	15.827 ^{32.28}	59	29.00	-0.32	1.12 ^{2.02}	3.04	766	8.1	30/85	1.87 ^{2.46}	0.837	9670	29.44
10 BLR	CASCANS													
10 MECH	CASCANS													
11 BLR	7373.7	54.21	71.5	29.00	-0.8	0.056	1.04	962	6.5	72	0.505	0.837	9645	29.59
11 MECH	2658.6	18.822 ^{36.795}	82.5	29.00	+1.9	1.48 ^{2.4}	0.45	770	6.7	30/75	1.87 ^{2.46}	0.837	9645	29.47
12 BLR	6526.1	57.72	87	28.48	-0.8	0.059	1.11	969	5.9	72	0.505	0.837	9652	29.44
12 MECH	3116.5	36.532 ^{18.808}	80	28.48	+2.2	2.47 ^{1.60}	4.0	775	6.5	85/30	2.46 ^{1.87}	0.837	9652	29.47
13 BLR	5783.9	57.11	70	28.33	-0.8	0.057	1.07	946	9.2	72	0.505	0.837	9660	29.39
13 MECH	1945.9	19.248 ^{35.011}	75	28.33	+1.9	1.55 ^{2.6}	0.53	744	4.5	30/85	1.87 ^{2.46}	0.837	9660	29.21
14 BLR	13,399.8	56.83	98	28.38	-0.8	0.073	1.31	986	3.9	72	0.505	0.837	9658	29.49
14 MECH	7861.5	48.688 ^{19.049}	102	28.38	+1.9	2.09 ^{1.53}	0.438	778	5.8	85/30	2.46 ^{1.87}	0.837	9638	29.47

PARTICULATE DATA SUMMARY
PART I

LOCATION: ASMA TEST SITE 1E

TEST NO.	Total Mass mgm.	Dry Gas Volume ft ³	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H ₂ O	Pitot ΔP "H ₂ O	Orifice ΔH "H ₂ O	Stack Gas Temp. °R	Excess O ₂ %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCE/10 ⁶ BTU	Flue Gas MW g/g mole
15 BLR	11350.3	62.51	99	29.83	-0.8	0.077	1.430	1007	5.9	72	0.505	0.837	9658	29.53
15 MECH	3386.2	57.65 20.317 57.334	91	29.81	+1.9	1.70 / 1.224	0.425	775	5.9	34 / 80	0.187 / 0.246	0.837	9658	29.53
20 BLR	9624.3	64.69	68	29.65	-0.8	0.079	1.466	987	7.0	72	0.505	0.837	9660	29.66
20 MECH	4307.3	57.688 30.275 27.413	74	29.65	+1.1	1.23 / 1.28	0.377	792	7.0	70/50	0.246 / 0.187	0.837	9660	29.55
23 BLR	2050.4	14.920	27.5	29.67	-0.8	0.035	0.21	953	7.6	60.3	0.381	0.837	9650	29.47
23 MECH	3762.7	44.342	63	29.67	-0.8	0.06	0.41	779	8.1	96	0.375	0.837	9650	29.40
30 BLR	2709.0	34.19	42.2	29.35	-0.8	0.027	6.49	896	8.8	69	0.505	0.837	9649	29.45
30 MECH	288.8	23.854 14.143	41.5	29.35	-1.2	1.33 / 1.095	0.28	740	9.9	40/50	0.187 / 0.246	0.837	9649	29.37
40 BLR	8631.8	56.27	90	29.86	-0.8	0.062	1.17	976	7.2	72.25	0.505	0.837	9656	29.43
40 MECH	372.9	23.453 9.433	95	29.86	+1.7	1.326 / 1.56	0.52	794	7.6	86/50	0.246 / 0.187	0.837	9656	29.45

PARTICULATE DATA SUMMARY
PART II

Location ABMA TEST SITE E - DC OUT (STACK)

TEST NO.	LOAD %	O ₂ %	CONDITIONS	EMISSIONS			Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
				lb/10 ⁶ BTU	GR/SCF	LB/HR				
3				0.313	0.120	59	5.02	35.69	965	108 102 106
4				0.198	0.092	71	6.69	58.71	1512	100 107 104
5				0.271	0.104	82	6.24	59.79	1575	103 102 102
6				0.335	0.150	103	6.91	52.42	1334	98 99 98
7				1.824	0.880	613	6.42	53.19	1354	104 102 103
8				0.190	0.089	60	6.25	50.63	1311	103 101 102
9				0.641	0.284	170	5.67	45.02	1162	97 95 96
11				1.558	0.769	553	6.83	54.20	1399	103 103 103
12				1.852	0.926	638	6.81	53.10	1338	99 99 99
13				1.460	0.578	404	6.40	52.06	1359	100 94 96
14				3.843	2.018	1405	7.72	54.16	1354	107 104 106
15				1.746	0.909	653	6.98	52.99	1397	106 117 113
20				2.408	1.162	849	5.78	55.50	1421	109 105 107

71

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 95.5

TEST NUMBER 2

Vac in. Hg ft³/min

DATE 10-16-78

Sampling Time Per Point, Min
3

Before
After

OPERATOR JD

FUEL

SITE E

PROBE LOCATION BLM

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter			
								In	Out				
<u>Part #6</u> 1		.03	.18	3901.79	540	330	290		95	82			1.2
2		.02	.12	3902.56	530	350	320		75	85			1.0
3		.02	.12	3903.34	500	160	280		80	90			1.0
4		.03	.18	3904.27	465	290	250		75	90			1.1
<u>Part #5</u> 1		.06	.36	3905.56	520	180	280		87	95			1.8
2		.03	.18	3906.46	525	300	290		78	97			1.1
3		.04	.24	3907.54	500	190	250		80	100			1.3
4		.05	.30	3908.70	475	330	280		75	100			1.5
<u>Part #4</u> 1		0											
2		0											
3		.03	.18	3909.60	480	230	260		90	105			1.2
4		.05	.30	3910.80	460	340	290		80	105			1.5
<u>Part #3</u> 1		0											
2		0											
3		.05	.30	3911.95	490	170	295		97	110			1.5
4		.04	.24	3912.96	460	320	310		90	110			1.2
<u>Part #2</u> 1		.03	.18	3913.92	500	170	340		100	110			.7
2		.02	.12	3914.61	505	200	330		80	110			.9
3		.02	.12	3915.31	480	160	300		90	110			1.2
4		.03	.18	3916.22	460	290	300		90	110			2.3
<u>Part #1</u> 1		.09	.54	3917.85	540	170	280		83	110			1.0
2		.02	.12	3918.65	520	200	300		80	110			1.0
3		.03	.18	3919.55	480	170	290		90	110			1.0
4		.04	.24	3920.58	445	310	290		80	110			1.2
Average		.035	.21	—	493	—	—						

Monograph Setup

METER VOL. END 3920.58
START 3901.66
SAMPLE VOL. 18.92 ft³

C _{pitot}	Stack Press. In. Hg-Capoe	Barometric Pressure
.837	-.82 H ₂ O	29.67

Percent O₂ =

P_{meter} = C
P_{stack} = T_{stack}
T_{meter} = ΔP
ΔH_g = Noz(Ideal)=
% H₂O = Noz(Actual)=

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	120	100	20
#2	100	100	0
#3	0	0	0
Total			
#4	g(End)	g(Start)	Δgrams
Silica Gel	150.5	143	7.5
Total Vol. H ₂ O			27.5 ml

7.917 x 10⁻⁴ ft²

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 95.6

TEST NUMBER 2

Sampling Time
Per Point, Min
4

Vac
in. Hg ft³/min
Before
After

DATE 11-16-78

OPERATOR R. AP

FUEL

SITE E

PROBE LOCATION ECON. OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ , %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
PART F 1	14:47	.07	.46	3619.55	315	260	300		80	110		4.3
2		.05	.33	3621.33	320	265	300		78	110		3.8
3		.04	.27	3622.75	320	300	300		75	110		3.2
4		.02	.13	3623.83	320	310	300		75	111		2.2
PART E 1		.04	.27	3625.37	320	250	295		70	118		3.2
2		.0	.27	3626.79	320	320	275		70	120		3.2
3		.03	.21	3628.15	320	310	280		70	122		2.8
4		.03	.21	3629.40	320	310	278		71	122		2.8
PART G 1		.10	.69	3631.70	320	250	300		71	128		5.7
2		.07	.48	3633.64	320	265	305		71	128		4.4
3		.05	.34	3635.35	320	300	305		70	129		3.6
4		.05	.34	3636.95	320	320	315		70	131		3.7
PART H 1		.11	.76	3639.43	310	260	295		70	132		6.3
2		.11	.76	3641.83	315	260	300		70	133		6.3
3		.07	.48	3643.73	320	300	305		70	135		4.4
4		.08	.55	3645.85	320	310	310		72	136		5.0
PART A 1		.03	.21	3647.21	-	250	260		78	130		2.8
2		.01	.05	3647.74	-	250	260		78	128		2.0
PART B 1		.07	.48	3649.70	-	250	255		72	128		4.4
2		.02	.14	3650.81	-	275	270		70	125		2.4
PART C 1		.10	.70	3653.27	-	250	290		70	125		6.0
2		.05	.34	3654.82	-	280	270		70	126		3.8
PART D 1		.10	.70	3657.34	-	250	285		75	128		6.2
2		.11	.76	3659.740	-	285	290		70	129		6.6
Average		.06	.41	---	318.7	---						

METER CORR. 1.0516

Nomograph Setup

METER VOL. END 3659.740
START 3617.573
SAMPLE VOL. 44.342 - CORR

C _{fitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	3.6420	29.67

Percent O₂ =

P _{meter} =	C	=	Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
P _{stack} =	T _{stack}	=	#1	148	100	48
T _{meter} =	ΔP	=	#2	106	100	6
ΔH _g =	Noz (Ideal) =	#3	0	0	0	
% H ₂ O =	Noz (Actual) =	7.6699 x 10 ⁻⁴	Total			54
			#4	g(End)	g(Start)	Δgrams
			Silica Gel	164	155	9
			Total Vol. H ₂ O			63 ml

PARTICULATE

DATA

Leak Check Date

ISOINETICS = 88.9

TEST NUMBER 3

Vac in. Hg ft³/min

DATE 10-17-78

Sampling Time Per Point, Min
3

Before After

OPERATOR JD

FUEL

SITE E

PROBE LOCATION Bldg

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ %	Vac.
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Impingers		Meter			
								In	Out				
PART #1	1	.04	.66	3931.88	485	300	240		70	80			3.0
	2	.02	.34	3933.29	470	315	262		80	82			1.8
	3	.03	.51	3934.94	425	250	260		80	85			2.3
	4	.045	.76	3936.87	380	270	275		71	88			4.0
PART #2	1	.01	.19	3937.86	460	280	270		85	91			1.2
	2	.01	.19	3938.84	460	300	290		78	91			1.2
	3	.03	.55	3940.48	450	160	280		80	92			2.5
	4	.06	1.1	3942.81	380	280	250		72	95			5.0
PART #3	1	.015	.28	3943.72	450	210	280		81	98			1.2
	2	.02	.34	3945.07	460	270	290		78	100			2.0
	3	.03	.55	3946.71	455	220	290		81	100			2.5
	4	.03	.55	3947.11	400	320	300		81	100			2.5
PART #4	1	0											
	2	.006	.11	3948.68	460	300	300		90	100			1.0
	3	.03	.55	3950.33	440	180	280		81	100			2.5
	4	.03	.55	3952.00	350	310	290		80	100			2.5
PART #5	1	.03	.55	3953.61	450		285		75	100			2.5
	2	.025	.46	3955.12	460	190	300		71	100			2.2
	3	.02	.37	3956.42	440	300	280		71	100			2.0
	4	.025	.46	3957.91	360	300	300		71	105			2.2
PART #6	1	.045	.83	3959.90	480	320	280		72	105			4.7
	2	.02	.37	3961.25	475	290	290		72	102			2.0
	3	.03	.55	3962.89	460	280	280		73	100			2.7
	4	.02	.37	3964.19	380	285	285		72	102			2.0
Average		.027	0.49	—	436								

METER VOL. END 3964.19
START 3930.00
SAMPLE VOL. 34.19

C _{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.40 H ₂ O	29.35

Percent O₂ =

Nomograph Setup

P _{meter} = C	T _{meter} = ΔF	ΔH _G	Δ H ₂ O	Imp. #1	Vol. (End) 133	Vol. (Start) 100	ΔVol. (ml) 33
F _{stack} = T _{stack}	ΔF	Noz (Ideal) =	Noz (Actual) = 1.3909 x 10 ⁻⁴ ft ²	Imp. #2	4	100	4
				Imp. #3	0	0	0
				Total			37
				Imp. #4	q (End) 153.9	q (Start) 148.7	Δgrams 5.2
				Silica Gel			Total Vol. H ₂ O 42.7

PARTICULATE

PRO-RATED

DATA

Leak Check Rate

ISOCHINETICS = 104.5

TEST NUMBER 3

Vac in. Hg ft³/min

DATE 11-18-78

Sampling Time Per Point, Min
5

Before After

OPERATOR R.A.P.

FUEL

SITE E

PROBE LOCATION MELN 01

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ , %	Vac.
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
Part 1	1.181	.47	.22	3661.97	280	280	250		50	55		2.8
2		.57	.26	3664.05	280	280	270		50	55		—
3		.74	.34	3666.43	280	280	280		50	60		3.7
4		.85	.40	3668.93	280	280	300		50	60		4.0
5		1.10	.50	3671.67	280	280	290		50	68		4.8
6		1.20	.55	3674.59	280	280	300		50	70		5.2
Part 2	1	.65	.27	3676.64	280	260	310		50	70		—
2		.44	.17	3678.17	280	290	300		50	68		2.2
3	2.246	.04	.02	3678.91	280	250	260		52	70		12.0
4		.60										
5		.10	.14	3680.42	280	280	270		52	70		2.4
6		.24	.33	3682.62	280	300	280		50	71		3.8
Part 3	1	.03										
2		.03										
3		.04	.03	3683.28	280	270	260		52	72		12.0
4		.12	.17	3684.91	280	285	260		52	72		2.3
5		.23	.32	3687.10	280	290	270		50	75		3.8
6		.33	.46	3689.61	280	290	270		50	76		4.9
Part 4	1	.07										
2		.05										
3		0.00										
4		.09	.12	3691.09	280	270	250		52	78		2.2
5		.22	.32	3693.37	280	300	270		52	80		3.5
6		.29	.43	3696.069	280	290	270		52	80		4.3
Average		.15	—	19.124								
		.17		18.822								

Nomograph Setup

METER VOL. END 3659.984
START
SAMPLE VOL. ft³

C_{pitot} .837
Stack Press. In. Hg-Gauge -.20 "H₂O
Barometric Pressure 29.35

Percent O₂ =

P_{meter} = C = Imp. #1
P_{stack} = T_{stack} = #2
T_{meter} = ΔP = #3
ΔH_g = Noz (Ideal) =
H₂O = Noz (Actual) = .187

Vol. (End) 132
Vol. (Start) 100
ΔVol. (ml) 32
Total 34
g (End) 156.0
g (Start) 148.5
Δgrams 7.5
Total Vol. H₂O 41.5 ml

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 98.8

TEST NUMBER 4-

DATE 11-20-78

OPERATOR JD

FULL _____

SITE E

PROBE LOCATION BLPMT

Sampling Time
Per Point, Min
3

Vac
in. Hg ft³/min
Before
After

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ , %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter			
								In	Out				
PORT #3 1		.03	.55	4001.89	530	150	250		70	105			3.0
2		.03	.55	4003.99	540	240	275		75	105			3.0
3		.09	1.7	4006.26	540	200	270		80	105			7.5
4		.075	1.4	4008.80	420	290	275		71	105			6.2
PORT #2 1		.07	1.3	4011.24	560	170	280		90	100			6.2
2		.07	1.3	4013.72	550	260	282		70	100			6.2
3		.055	1.0	4015.88	540	180	260		80	100			5.2
4		.08	1.5	4018.52	520	270	270		77	100			7.0
PORT #1 1		.105	2.0	4021.59	600	240	250		80	100			9.2
2		.075	1.4	4024.63	580	250	215		89	97			7.0
3		.05	.95	4026.79	560	190	220		89	95			5.5
4		.08	1.5	4029.41	460	250	230		80	95			7.0
PORT #6 1		.07	1.4	3975.79	580	330	260		81	90			6.7
2		.035	.68	3977.50	575	350	280		78	90			3.0
3		.06	1.2	3979.89	540	160	260		80	90			5.6
4		.06	1.2	3982.25	300	270	270		73	90			5.7
PORT #5 1		.06	1.1	3984.59	550	260	280		90	98			5.3
2		.08	1.5	3987.21	560	300	295		80	98			6.8
3		.055	1.0	3989.41	540	220	280		80	100			5.0
4		.06	1.1	3991.71	320	300	290		75	100			5.3
PORT #4 1		.045	.85	3993.72	540	180	230		87	100			4.7
2		.03	.55	3995.31	540	260	280		80	101			2.5
3		.06	1.1	3997.80	530	220	270		80	105			5.3
4		.07	1.3	4000.23	400	320	280		70	105			6.0
		.062	1.17	—	515								
Average		.062	1.17		515								

4029.41

Nomograph Setup

METER VOL. END
START 3975.14
SAMPLE VOL. 50.270

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal) =
% H₂O = Noz(Actual) = .505

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	151	100	51
#2	125	100	25
#3	0	0	0
Total			76
#4	g(End)	g(Start)	Grams
Silica	154	140	14
Total Vol. H ₂ O			90 ml

V _{pitot}	Stack Pres. In. Hg Gauge	Barometric Pressure
.837	-.82	29.86

Percent O₂ =

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 101.3

PRO-RATED

TEST NUMBER 4

DATE 11-20-78

OPERATOR R.A.P

FUEL

SITE

PROBE LOCATION MECHOUR

Sampling Time
Per Point, Min
5

Vac
in. Hg ft³/min
Before
After

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂	Vac.
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
PORT 1	12:30	.10	.14	3697.89	330	270	295		42	52		
2		.57	.75	3701.39	330	265	305		40	52		6.2
3		.73	.96	3705.29	335	265	290		42	53		8.0
4		.65	.87	3708.85	335	260	290		42	58		7.1
5		.42	.56	3711.83	335	260	290		42	60		4.6
6	6 min.	.04	.02	3712.73	330	250	290		42	62		12.0
PORT 1	1:26	.08	.10		325	250	295		40	68		12.0
2	NOZ	-.02										
3		.07	.09	3714.11	330	250	300		40	68		12.0
4		.11	.13	3716.78	330	250	300		40	68		2.0
5		.06	.05	3717.74	330	250	300		40	69		12.0
6		.05	.04	3718.61	335	255	305		42	70		12.0
PORT 2		.15	.18	3720.35	335	250	260		42	70		
2		.53	.64	3723.45	335	260	265		42	70		
3		.45	.55	3726.40	335	270	270		42	71		4.8
4		.68	.82	3730.86	335	270	275		45	72		6.5
5		.48	.58	3732.80	335	270	290		45	75		4.8
6		.38	.46	3735.45	335	260	300		45	78		3.8
PORT 1		1.30	.52	3738.30	330	250	250		42	76		5.3
2		1.9	.78	3741.64	335	250	270		42	72		8.2
3	1:57	2.50	1.05	3745.55	335	270	280		42	72		12.0
4	NOZ	2.40	.98	3749.44	340	270	300		45	75		11.0
5		2.0	.82	3752.87	340	265	300		45	75		9.0
6		1.70	.70	3756.080	340	270	300		47	78		7.1
Average		.326 1.96	.512	41.168 2.694	332 336							

METER CORR 1.0516

Nomograph Setup

METER VOL. END 3756.080
START 3696.302
SAMPLE VOL. ft³

C _{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.857	1.7 H ₂ O	29.86

Percent O₂ =

P _{meter} = C	Imp. #1	Vol. (End)	Vol. (Start)	ΔVol. (ml)
P _{stack} = T _{stack}	#2	176	100	76
T _{meter} = ΔP	#3	110	100	10
ΔH _g = Noz (Ideal) =		1	0	1
% H ₂ O = Noz (Actual) =				
				Total 87

g (End)	g (Start)	Δgrams
155	147	8
Total Vol. H ₂ O		95 ml

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 94.5

TEST NUMBER 5

Sampling Time
Per Point, Min
3

Vac
in. Hg ft³/min
Before
After

DATE 11-23-78
OPERATOR J.D.
FUEL Knt Industrial
SITE E
PROBE LOCATION BLR-0317

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ , %	Vac.
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Impingers		Meter			
								In	Out				
PORT #1		.10	1.80	4039.18	560	320	260		81	81			8.0
2		.07	1.30	4041.61	540	340	280		81	75			6.0
3		.05	.95	4043.77	530	150	310		85	88			4.8
4		.07	1.30	4046.29	440	270	270		82	75			6.0
PORT #2		.045	.85	4048.36	530	160	260		89	90			4.4
6		.075	1.40	4050.99	530	280	280		75	90			6.1
7		.045	.85	4053.05	510	180	270		87	91			4.4
8		.06	1.1	4055.39	260	295	270		80	92			5.2
PORT #3		.035	.65	4057.23	510	185	270		89	93			3.0
10		.04	.75	4059.16	520	275	275		88	95			4.0
11		.06	1.10	4061.52	495	170	265		82	95			5.2
12		.08	1.50	4064.24	370	290	275		75	95			6.4
PORT #4		.045	.85	4066.27	520	170	270		82	92			4.5
14		.04	.75	4068.21	520	265	280		78	95			4.1
15		.05	.95	4070.40	520	240	270		70	93			4.8
16		.05	.95	4072.59	340	300	275		70	92			4.8
PORT #5		.05	.95	4074.79	520	180	270		75	92			5.0
18		.085	1.60	4077.57	540	270	280		70	91			7.0
19		.05	.95	4079.75	510	105	250		78	92			4.9
20		.06	1.1	4082.08	400	280	260		70	92			5.5
PORT #6		.02	.38	4083.47	550	210	265		80	91			2.0
22		.02	.38	—	540	280	275		72	91			2.0
23		.015	.28	4086.01	580	190	250		81	91			1.8
24		.05	.95	4088.21	370	300	260		72	91			5.0
Average		.053	.44	—	522	—	—						

Nemograph Setup

METER VOL. END 4088.21
START 4030.17
SAMPLE VOL. 52.04 ft³

Cp:tot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	.8" H ₂ O	29.75

Percent O₂ =

Pmeter = C
Pstack = Tstack
Tmeter = ΔP
ΔHg =
% H₂O =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	156	100	56
#2	147	100	47
#3	0	0	0
Total			
#4	g(End)	g(Start)	Δgrams
Silica Gel	154	143	10
Total Vol. H ₂ O 75 ml			

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = $\frac{102.9}{101.5}$

TEST NUMBER 5

Vac
in. Hg ft³/min

DATE 11-23-78

Sampling Time
Per Point, Min
5

Before
After

OPERATOR R.A.P.

FUEL Kent Industrial

SITE S.E.

PROBE LOCATION MECH

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ , %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
PORT #1	12:58	1.3	.50	3759.14	330	285	295		52	65		4.5
	2	1.90	.74	3762.48	330	295	305		52	62		6.3
	3	2.1	.81	3765.97	330	295	305		52	65		7.0
	4	2.2	.85	3769.54	330	300	320		52	70		7.7
	5	2.1	.81	3773.00	330	300	320		52	72		7.1
	6	1.7	.65	3776.12	335	300	315		52	78		5.8
PORT #3	7	.05										
	8	0.00										
	9	.07	.09	3777.32	330	250	290		53	80		22.0
	10	.07	.09	3778.40	330	290	290		52	90		22.0
	11	.08	.10	3779.60	330	300	295		52	81		22.0
	12	.05										
PORT #4B	13	.21	.28	3781.59	330	280	250		52	81		2.8
	14	.50	.66	3784.68	330	290	250		52	81		5.3
	15	.58	.77	3788.08	330	310	280		53	88		6.2
	16	.67	.88	3791.55	330	310	285		55	88		7.0
	17	.42	.55	3794.39	330	290	295		55	90		4.6
	18	.13	.17	3795.85	325	285	310		55	91		2.0
PORT #2A	19	.28	.37	3798.17	325	250	280		57	91		3.2
	20	.21	.29	3800.13	325	250	285		60	92		2.8
	21	.33	.44	3802.58	325	270	285		58	91		4.0
	22	.48	.64	3805.61	330	270	290		63	93		5.5
	23	.49	.65	3808.62	330	275	300		60	95		5.5
	24	.44	.58	3811.494	330	275	300		58	97		4.8
Average		1.48	.33	20.790	330							
			.52	37.199	329							

METER CORR Nomograph Setup

METER VOL. END 3811.494 START 3750.350

SAMPLE VOL. 57.489 ft³

METER CORR 1.0516

C _{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	+2.6" H ₂ O	29.75

Percent O₂ =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	156	100	56
#2	112	100	12
#3	2	0	2
Total			70
#4	g(End)	g(Start)	Δgrams
Silica Gel	159	148	11
Total Vol. H ₂ O			81 ml

Handwritten notes: 187, 246

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 100.0

TEST NUMBER 6

Vac in. Hg ft³/min

DATE 12-12-70

Sampling Time Per Point, Min
3

Before
After

OPERATOR JB

FUEL Industrial

SITE E

PROBE LOCATION BLR out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter			
								In	Out				
1		.03	.55	4101.69	560	310	270		100	90			2.5
2		.03	.55	4103.34	560	325	270		79	90			2.5
3		.03	.55	4105.00	520	140	250		80	90			2.5
4		.04	.75	4106.93	460	275	250		72	91			3.0
1		.065	1.20	4109.31	520	180	240		80	93			5.5
2		.10	1.90	4112.27	530	280	260		65	96			8.0
3		.05	.95	4114.44	570	180	260		80	98			4.8
4		.055	1.0	4116.63	340	290	270		80	99			5.0
1		.03	.55	4118.24	570	180	270		85	101			2.5
2		.03	.55	4119.89	530	270	280		82	101			2.5
3		.045	.85	4121.90	505	190	260		86	101			4.6
4		.06	1.1	4124.17	420	285	280		80	101			5.5
1		.02	.38	4125.54	570	170	275		91	100			2.0
2		.05	.95	4127.70	520	250	300		81	100			5.0
3		.065	1.20	4130.16	520	220	290		90	100			6.0
4		.095	1.80	4132.94	500	320	300		80	100			8.0
1		.05	.95	4135.65	530	175	275		90	100			5.2
2		.08	1.50	4137.81	520	240	315		60	100			7.0
3		.04	.75	4139.71	500	170	300		80	97			4.6
4		.06	1.10	4142.99	480	260	315		75	95			5.9
1		.08	1.50	4145.89	560	280	290		81	93			7.5
2		.08	1.50	4147.49	530	310	320		88	95			7.5
3		.04	.75	4149.58	500	180	300		95	98			5.0
4		.075	1.40	4152.17	490	270	320		80	100			7.2
				4153.20									
Average		.054	1.01		512								

4153.20

METER VOL.	END	START
		4100.00
SAMPLE VOL.		53.20 ft ³

C _{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.8" H ₂ O	29.29

Percent O₂ =

Nomograph Setup

P _{meter}	=	C	=	Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
				#1	165	100	65
P _{stack}	=	T _{stack}	=	#2	111	100	11
T _{meter}	=	ΔP	=	#3	0	0	0
ΔH _g	=	Noz (Ideal)	=				
% H ₂ O	=	Noz (Actual)	=				
							Total 76
				#4	q(End)	q(Start)	Δgrams
				Silica	159	148	11
				Cl			
							Total Vol. H ₂ O 87 ml

PARTICULATE

NO2 - .240 - 97.6

NO2 - .187 - 98.1

DATA

Leak Check Rate

ISOTHERMICS =

TEST NUMBER 6

Vac
In. Hg ft³/min

DATE 12-12-78

Sampling Time Per Point, Min
<u>5</u>

Before
After

OPERATOR R.A.P.
FUEL Kent-Industrial
SITE E
PROBE LOCATION MECH our

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ %	Vac.
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Thermopiles		Meter			
								In	Out				
Part 2 1	14:12	.20	.26	3820.72	325	300	300		62	72			
2		.20	.26	3822.65	325	310	330		62	72			2.5
3		.28	.37	3825.00									
4		.40	.53	3827.74	330	300	270		62	85			4.8
5		.29	.38	3830.05	330	300	275		62	85			3.2
6		.36	.47	3832.56									
Part 3 7		.00											
8	6.6	.03	.03	3833.31	330	240	270		62	91			12.0
9		.07	.09	3834.31	325	290	295		61	91			12.0
10		.07	.09	3835.36	330	300	300		60	90			12.0
11		.05	.05	3836.08	330	295	295		60	91			12.0
12		.05	.05	3836.92	325	295	300		60	93			12.0
Part 4 13		.11	.14	3838.35	325	250	295		62	95			2.0
14		.32	.42	3840.71	325	280	295		62	96			3.9
15	15:53	.51	.67	3843.75	325	300	300		63	98			5.5
16		.55	.74	3846.54	330	300	300		63	98			4.8
17		.37	.49	3849.13	330	300	310		62	98			4.2
18		.17	.22	3850.83	325	300	310		61	100			2.5
Part 5 19		.99	.38	3853.17	325	250	250		60	99			2.3
20		1.55	.60	3855.95	325	265	250		60	99			4.8
21		1.90	.74	3859.21	325	275	280		60	98			6.1
22		1.95	.75	3862.41	335	290	290		60	98			6.2
23		1.90	.74	3865.54	330	290	300		60	98			6.1
24		1.40	.54	3868.305	330	290	310		60	99			4.7
-													
Average		.229 1.615	.38	33.777 18.376	327 328								

246
NO2

187
NO2

METER VOL. END 3868.305
START 3818.710
SAMPLE NO. 52154

Stack Press. In. Hg-Seal	Parametric Pressure
<u>.037 + 1.5" H₂O</u>	<u>29.29</u>

Percent O₂ =

Manograph Scale

P _{meter} = C =	Imp. Vol. (End)	Vol. (Start)	Δ Vol. (ml)
P _{stack} = T _{stack} = #1	156	100	56
T _{meter} = ΔP = #2	112	100	12
ΔH _g = Noz(Ideal) = #3	1	0	1
% H ₂ O = Noz(Actual) =			
	Total		
	c(End)	c(Start)	Corr
	199	188	11
	Total Vol. H ₂ O		80 ml

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 96.4

TEST NUMBER 7

Sampling Time
Per Point, Min
3

Vac
in. Hg ft³/min
Before
After

DATE 12-11-78
OPERATOR JD
FUEL _____
SITE E
PROBE LOCATION BLK 04

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ , %	Voc.
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Impingers		Meter			
								In	Out				
PORT #1 1		.10	1.9	4160.47	560	280	240		80	70			7.5
2		.09	1.7	4163.40	540	330	280		75	72			7.0
3		.04	.75	4165.39	520	140	280		80	75			4.0
4		.09	1.7	4168.49	500	250	300		80	78			7.0
PORT #2 1		.05	.95	4170.69	530	140	300		85	80			4.5
2		.10	1.9	4173.84	530	285	310		70	80			8.0
3		.04	.75	4175.79	510	180	290		80	82			4.0
4		.08	1.5	4178.55	500	250	280		79	82			6.2
PORT #3 1		.03	.55	4180.26	500	165	270		90	85			3.5
2		.04	.75	4182.24	510	240	280		69	85			4.0
3		.08	1.5	4184.94	510	145	250		70	85			6.2
4		.09	1.7	4187.84	500	300	270		68	85			7.0
PORT #4 1		.055	1.0	4189.65	500	170	270		75	85			4.0
2		.05	.95	4191.84	520	295	295		70	87			4.7
3		.05	.95	4193.99	500	175	280		70	90			4.7
4		.07	1.3	4196.58	380	320	290		70	90			6.0
PORT #5 1		.06	1.1	4199.04	500	180	270		78	90			5.5
2		.10	1.9	4202.11	530	290	290		68	90			8.0
3		.06	1.1	4204.47	500	180	270		75	90			5.2
4		.08	1.5	4207.18	490	320	290		75	90			6.5
PORT #6 1		.12	2.2	4210.44	560	260	290		80	92			9.0
2		.05	.95	4212.61	560	320	300		70	92			5.0
3		.08	1.5	4215.27	520	180	290		75	90			6.9
4		.08	1.5	4217.37	500	320	300		80	90			7.0
Average		0.07	1.3	—	955°R	—							

METER VOL. END 4217.37
START 4157.40
SAMPLE VOL. 59.97

C_{pitot} .837 Stack Press. In. Hg-Gauge -0.8 Barometric Pressure 29.20

Percent O₂ =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal) =
% H₂O = Noz(Actual) =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	<u>165</u>	<u>100</u>	<u>65</u>
#2	<u>111</u>	<u>100</u>	<u>11</u>
#3	<u>0</u>	<u>0</u>	<u>0</u>
Total:			<u>76</u>
#4	<u>g(End)</u>	<u>g(Start)</u>	<u>Δgrams</u>
Silica Gel	<u>155</u>	<u>142</u>	<u>13</u>
Total Vol. H ₂ O			<u>89 ml</u>

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS =

103.4 .187 sec.
101 T. 746 sec.

TEST NUMBER

7

DATE

12-14-78

OPERATOR

RAT

FUEL

Kent-Jacket

SITE

E

PROBE LOCATION MECH 011

Sampling Time Per Point, Min
5

Vac
in. Hg ft³/min
Before
After

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ %	Vac.	
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter			
								In	Out				
PART 1 187	1	.77	.38	3871.19	325	270	285		53	51		4.2	
	2	14:35	1.60	.62	3874.35	325	270	300		52	52		6.2
	3		1.70	.65	3877.50	325	270	310		52	58		6.3
	4		2.0	.78	3880.90	330	280	310		51	62		7.2
	5		1.80	.70	3884.21	330	275	310		50	60		6.8
	6		1.30	.50	3886.902	330	270	300		50	70		7.0
PART 3 24	7	0.00											
	8		.06	.08	3887.98	325	260	260		50	71		22.0
	9		.10	.13	3889.46	330	288	280		51	71		2.0
	10		.14	.17	3891.09	330	275	290		50	72		2.2
	11		.06	.08	3892.21	330	275	310		51	75		22.0
	12		.05	.06	3893.11	330	280	310		52	75		22.0
PART 4 24	13		.11	.14	3894.56	325	250	270		52	75		2.2
	14		.40	.54	3897.45	325	290	290		52	80		6.2
	15		.47	.63	3900.47	325	290	300		52	80		7.0
	16		.54	.70	3903.62	325	290	310		53	81		8.1
	17		.40	.54	3906.49	325	285	310		52	81		6.2
	18		.11	.14	3907.95	325	280	310		52	81		2.2
PART 2 24	19		.19	.22	3909.84	320	250	270		53	80		2.9
	20		.21	.29	3912.02	320	260	277		53	80		3.2
	21		.37	.49	3914.66	325	285	265		53	80		5.0
	22		.54	.70	3917.85	320	290	280		52	80		6.5
	23		.46	.60	3920.74	325	290	260		52	81		5.8
	24		.42	.55	3923.543	330	290	270		53	82		5.2
Average		1.56 212	.42	14.184 38.531	328 325								

METER VOL. END 3923.543
START 3868.654
SAMPLE VOL. 57.721 ft³

C _F tot	Stack Press. In. Hg-Gauge	Barometric Pressure
.037	+ 2.0" H ₂ O	26.20

Percent O₂ =

METER CORR - 1.0516

Nomograph Setup:
P_{meter} = C
P_{stack} = T_{stack}
T_{meter} = ΔP
ΔHg = Noz(Ideal) =
H₂O = Noz(Actual) =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	162	100	62
#2	106	100	6
#3	0	0	0
Total			

g (End)	g (Start)	grams
157	145	12

Total Vol. H₂O 92 ml

.246
.187

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 92.8%

TEST NUMBER 8

Vac
in. Hg ft³/min

DATE 12-15-78

Sampling Time
Per Point, Min
3

Before
After

OPERATOR JJ

FUEL

SITE E

PROBE LOCATION Butter Out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
Port #6 1		.05	.95	4227.18	530	300	250		80	100		4.8
2		.03	.55	4228.97	520	330	270		72	100		3.2
3		.06	1.1	4231.25	500	150	245		80	105		5.0
4		.07	1.3	4233.76	470	270	260		72	108		5.5
Port #5 1		.045	.85	4235.65	490	170	260		90	110		4.0
2		.10	1.9	4238.53	520	260	270		75	110		7.2
3		.04	.75	4240.41	490	180	250		85	110		4.0
4		.075	1.4	4242.95	480	300	270		78	115		6.0
Port #4 1		.04	.75	4244.81	490	180	280		90	115		4.0
2		.05	.95	4246.92	500	280	290		80	115		4.8
3		.05	.95	4248.67	500	200	290		85	120		4.8
4		.08	1.5	4251.30	490	310	300		80	120		6.5
Port #3 1		.02	.38	4252.53	500	200	300		95	120		3.0
2		.04	.75	4254.38	500	300	310		80	120		4.0
3		.07	1.3	4256.78	500	280	310		90	120		5.8
4		.09	1.7	4259.55	500	370	320		70	120		7.0
Port #2 1		.05	.95	4261.62	520	170	320		90	120		4.9
2		.08	1.5	4264.22	530	290	320		80	123		6.8
3		.04	.75	4266.04	500	200	300		90	125		4.0
4		.07	1.3	4268.44	490	310	315		85	125		6.0
Port #1 1		.08	1.5	4270.94	560	260	320		100	125		6.5
2		.05	.95	4272.99	530	340	330		95	125		5.0
3		.05	.95	4275.03	510	240	310		100	123		5.0
4		.08	1.5	4277.61	480	350	330		90	123		7.0
Average		.059	1.10		505							

Nomograph Setup

METER VOL. END 4277.61
START 4225.00
SAMPLE VOL. 52.61 ft³

C _{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		

Percent O₂ =

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal) =
% H₂O = 6.8 Noz(Actual) =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	154	100	54
#2	112	100	12
#3	0	0	0
Total			66

	g(End)	g(Start)	Δgrams
#4 Silica Gel	159.5	147	12.5
Total Vol. H ₂ O			78.5 ml

PARTICULATE

DATA

Leak Stack Rate

DYNAMOMICS =

TEST NUMBER

Sampling Time
Per Point, Min
5

Before
After

Vac
in/s ft/min

DATE 12-15-78
OPERATOR R.A.P.
FUEL Keok Industrial
SITE E
FACILITY LOCATION MECA

102.8 - .246 NO2
100.3 - .187 NO2

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Filters		Meter	O ₂ %	Vac.
Part 2 1	13.30	.21	.28	3925.97	310	260	305		60	55		3.1
2	246 NO2	.11	.14	3927.59	310	280	300		58	58		2.2
3		.26	.34	3930.00	300	275	290		50	60		3.6
4		.35	.46	3932.62	300	275	290		52	61		4.1
5		.32	.42	3935.33	310	270	295		51	65		4.0
6		.38	.50	3938.10	310	270	290		50	68		4.5
Part 3 7		-0.05										
8		0.00										
9		.09	.12	3939.62	305	270	285		51	70		2.0
10		.05	.06	3940.59	310	270	295		51	71		2.0
11		.04	.05	3941.52	310	270	290		51	71		2.0
12		.04	.05	3942.47	310	270	300		51	71		2.0
Part 4 13		.10	.13	3943.91	310	250	280		52	72		2.0
14		.29	.38	3946.34	305	290	290		52	72		3.7
15		.51	.67	3949.48	305	295	295		52	73		5.9
16		.43	.56	3952.40	310	290	300		52	75		5.2
17		.33	.43	3954.95	305	285	300		52	78		4.0
18		.06	.08	3956.04	305	280	300		52	80		2.0
Part 19	.187	1.1	.42	3958.59	310	250	270		53	80		4.3
20		1.40	.54	3961.49	310	270	270		53	80		5.3
21		1.70	.65	3964.58	310	280	280		53	80		6.3
22		1.70	.65	3967.68	310	280	280		53	80		6.3
23		1.00	.61	3970.69	310	270	280		53	81		6.0
24		1.30	.50	3973.478	310	280	280		53	81		5.1
Average		223 / 1.46	.36	33.935 / 19.337	306 / 308							

METER CORR 1.0516

METER VOL. 3973.478
SAMPLE VOL. 3923.774.3

Stack Temp. 2900 (L)
Percent O₂ =

Filter	C	Imp.	Vol. (End)	Vol. (Start)	Vol. (Filt)
Filter #1		#1	152	100	52
Filter #2		#2	108	100	8
Filter #3		#3	0	0	0
Total			158	147	11

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 91.5

TEST NUMBER 9

Vac in. Hg ft³/min

DATE 12-16-78

Sampling Time Per Point, Min
3

Before
After

OPERATOR JD
FUEL Ken. Ind.
SITE E
PROBE LOCATION Boiler out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ , %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
Port #1	1	.07	1.3	4287.74	540	290	280		85	80		6.0
	2	.05	.95	4289.99	520	310	290		70	78		4.8
	3	.04	.75	4291.98	500	120	250		70	80		4.0
	4	.07	1.3	4294.57	460	270	260		70	80		6.0
Port #2	1	.05	.95	4296.86	500	150	260		80	70		4.8
	2	.07	1.3	4299.47	500	270	290		70	80		6.0
	3	.03	5.5	4301.24	470	150	280		80	80		3.8
	4	.05	.95	4303.47	470	270	300		72	80		5.0
Port #3	1	.025	.45	4305.04	490	200	285		80	80		3.5
	2	.35	.65	4306.88	500	360	300		75	80		4.0
	3	.05	.95	4309.16	480	200	300		80	80		5.0
	4	.065	1.2	4311.65	460	320	320		72	80		6.1
Port #4	1	.04	.75	4313.65	460	170	300		80	80		4.5
	2	.04	.75	4315.65	500	280	320		75	80		4.5
	3	.04	.75	4317.67	480	180	280		80	80		4.5
	4	.06	1.1	4320.06	470	310	300		72	80		5.3
Port #5	1	.04	.75	4322.12	480	160	260		72	80		4.8
	2	.09	1.7	4325.02	500	280	275		72	80		8.0
	3	.03	5.5	4326.96	470	140	260		80	80		4.0
	4	.065	1.2	4329.45	460	300	290		80	82		6.0
Port #6	1	.06	1.1	4331.84	520	140	280		80	83		5.9
	2	.03	.55	4333.50	510	300	315		80	85		4.0
	3	.06	1.1	4335.85	470	140	260		82	90		5.9
	4	.06	1.1	4338.22	460	300	300		90	90		5.9
Average		.06	.91		486.25							

Nomograph Setup

METER VOL. END 4338.22
START 4285.00
SAMPLE VOL. 53.22 ft³

C _{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		29.00

Percent O₂ =

P_{meter} = C
P_{stack} = T_{stack}
T_{meter} = ΔP
ΔH_g = Noz(Ideal) =
% H₂O = 6.1 Noz(Actual) =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	147	100	47
#2	108	100	8
#3	0	0	0
Total			55

	g(End)	g(Start)	Δgrams
Silica Gel	155.5	140	15.5
Total Vol. H ₂ O			70.5 ml

PARTICULATE

DATA

Leak Check Date

NO. INCHES =

.187 - 99.1
.246 - 97.6

TEST NUMBER

9

DATE

12-10-79

OPERATOR

R. A. P.

FUEL

KENT-INDUST

SIZE

E

FRASE LOCATION: MECH OUT

Sampling Time Per Point, Min.
5

Before
After

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ %	Vac.
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Inchiders		Meter			
								In	Out				
PORT #1	12:24	.74	.28	3975.83	310	250	300		60	75		3.2	
2		1.10	.42	3979.43	310	300	290		62	75		4.5	
3		1.30	.50	3981.22	310	270	305		61	78		5.2	
4		1.40	.54	3984.05	310	280	310		58	81		5.6	
5		1.20	.46	3986.54	310	285	310		57	83		4.5	
6		.95	.36	3988.78	310	285	310		55	88		3.8	
PORT #3		-.03											
8		.07	.09	3989.97	310	300	300		52	90		22.0	
9		.07	.09	3991.19	310	290	310		55	90		22.0	
10		.03	.04	3992.05	310	300	310		55	90		22.0	
11		.04	.05	3993.00	310	295	310		55	90		22.0	
12		.04	.05	3993.83	305	295	310		55	92		22.0	
PORT #4		.12	.16	3995.41	300	250	295		55	95		2.2	
14		.21	.28	3997.40	300	295	295		55	96		3.2	
15		.34	.45	3999.93	305	295	300		55	96		4.8	
16		.36	.47	4002.52	305	295	310		55	96			
17		.28	.37	4004.75	300	300	300		55	98		4.0	
18		.14	.18	4006.30	300	295	300		55	100		2.2	
PORT #2		.21	.28	4008.25	305	250	260		55	99		3.2	
20		.20	.26	4010.19	305	300	280		55	98		3.2	
21		.33	.44	4012.62	305	310	280		55	98		4.8	
22		.38	.50	4015.35	300	300	285		55	99		5.2	
23		.37	.49	4017.80	305	295	300		56	100		4.8	
24		.24	.32	4019.922	300	290	290		55	100		3.6	
Average		.1115 / .202	.304	15.827 / 32.749	310 / 304								

METER VOL.	END
START	3973.730
SAMPLE VOL.	ft ³

C _{stot}	Stack Press. In. H ₂ O	Parametric Pressure
.037	.32" H ₂ O	29.00

Percent O₂ =

METER 1.0516 Monograph Setup

P _{meter} =	C		Imp.	Vol. (End)	Vol. (Start)	Δ Vol. (ml)
P _{stack} =	T _{stack}		#1	142	100	42
T _{meter} =	Δ P		#2	105	100	5
Δ H _e =	W _z (Ideal) =		#3	0	0	
% H ₂ O =	W _z (Actual) =	.187				Total 47

.246

Silica	Vol. (End)	Vol. (Start)	Δ grams
del.	153	141	12

Total Vol. H₂O 59 ml

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 96.7

TEST NUMBER 11

Vac
in. Hg ft³/min

DATE 12-18-78

Sampling Time
Per Point, Min
3

Before
After

OPERATOR JD

FUEL NENT-EMD

SITE E

PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Impingers		Meter	O ₂ , %	Vac.
								In	Out			
Part 4 1		.02	.38	4357.45	520	320	180		80	80		2.9
2		.02	.38	4352.87	520	330	180		68	80		2.9
3		.06	1.10	4255.26	490	150	200		72	80		4.5
4		.06	1.1	4357.62	470	270	220		68	80		4.5
Part 3 1		.06	1.1	4360.02	500	140	200		80	80		4.5
2		.08	1.5	—	500	280	220		69	80		6.0
3		.05	.95	4364.92	480	170	200		69	80		4.1
4		.07	1.3	4367.49	480	285	240		70	82		5.2
Part 4 1		.055	1.0	4369.75	490	108	270		85	85		4.7
2		.06	1.1	4372.11	500	330	260		75	85		5.0
3		.055	1.0	4374.36	480	200	240		90	89		4.9
4		.06	1.1	4376.71	470	300	280		80	90		5.1
Part 3 1		.03	.55	4378.48	490	180	250		90	90		3.8
2		.03	.55	4380.20	500	330	250		70	90		3.8
3		.07	1.3	4382.71	480	190	250		80	90		6.0
4		.08	1.5	4385.41	500	290	280		70	90		6.2
Part 2 1		.06	1.1	4387.73	520	245	280		72	90		5.2
2		.07	1.3	4390.30	530	330	280		70	90		6.0
3		.04	.75	4392.25	510	190	260		75	90		4.8
4		.075	1.4	4394.84	500	310	280		75	90		6.5
Part 1 1		.07	1.3	4397.34	560	215	260		70	90		6.0
2		.065	1.2	4399.81	540	350	280		75	85		5.9
3		.03	.55	4401.50	570	215	270		90	85		4.0
4		.08	1.5	4404.21	500	350	280		80	89		7.0
		0.056	1.04	—	—	—	—		—	—		—
Average		↓	↓	—	502							

Nomograph Setup

METER VOL. END 4404.21
START 4350.00
SAMPLE VOL. 54.2 ft³

C _p tot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	- .02" H ₂ O	28.40

Percent O₂ =

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal) =
% H₂O = Noz(Actual) = 1.379 x 10⁻³

Imp. Vol. (End) Vol. (Start) ΔVol. (ml)
#1 154 - 100 = 54
#2 108 - 100 = 8
#3 0 - 0 = 0
Total 62

#4 g(End) g(Start) Δgrams
Silica Gel 157.5 - 148 = 9.5
Total Vol. H₂O 71.5 ml

PARTICULATE

DATA

Leak Check Rate

ISOTHERMICS =

.187 NO2 - 100.1
.246 NO2 - 101.6

TEST NUMBER 11

Sampling Time
Per Point, Min
5.0

Vac
In. Hg ft³/min
Before
After

DATE 12-18-78
OPERATOR RP
FUEL KWT-102
SITE E
PROBE LOCATION Muck art

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Filters		Meter	O ₂ %	Vac.
								In	Out			
1		.78	.75	4022.76	310	250	300		52	61		3.9
2		1.50	.58	4026.05	305	230	310		52	62		6.1
3		1.70	.65	4029.23	305	250	310		52	63		5.8
4		1.90	.74	4032.52	310	230	315		51	63		6.6
5		.70	.65	4035.66	310	230	310		52	72		5.2
6		.11	.42	4038.24	310	230	310		52	73		4.0
PART 3												
7		2.05										
8		0.00										
9		.05	.06	4039.27	315	250	230		49	76		12.0
10		.11	.14	4040.75	310	280	280		49	73		2.0
11		.10	.13	4042.32	310	280	230		49	73		12.0
12		0.00										
PART 4												
13		.13	.17	4043.83	305	250	250		49	82		2.0
14		.38	.44	4046.47	310	230	270		49	82		4.0
15		.46	.61	4049.49	310	270	235		43	82		5.3
16		.50	.66	4052.52	310	235	290		43	82		5.3
17		.36	.48	4055.13	310	230	300		49	85		4.2
18		.13	.17	4056.65	310	230	310		43	89		2.0
PART 5												
19		.32	.42	4059.28	310	250	300		43	87		4.0
20		.23	.30	4061.35	310	230	310		43	85		3.0
21		.42	.56	4064.23	310	290	310		49	85		5.0
22		.52	.67	4067.32	315	290	310		50	85		6.0
23		.43	.64	4070.38	310	290	310		51	85		6.0
24		.42	.56	4073.23	310	290	310		51	85		5.3
Average		1.48 / .304	0.45	18.832 / 36.795	310							

METER VOL. END 4020.352
START 4020.352
SAMPLE VOL. 5.0

Pilot	Stack Press. In. Hg - 1000	Particulate Pressure
.637	1.9" H ₂ O	26.40

Percent O₂ =

Manograph Setup

Pmeter = C	Imp. Vol. (End)	Vol. (Start)	(Vol. Pil)
Estack = Tstack =	#1 164	102	64
Tmeter = LP	#2 108	100	8
Mag = Noz (Ideal) =	#3 0	0	
% H ₂ O = 68	Noz (Actual) =	Total	72
	NO2 .187		
	NO2 .246		
	Silica	g(End)	g(Start)
	158.5	149	10.5
	Total Vol. H ₂ O		42.5

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 103.2

Sampling Time
Per Point, Min
3

Vac
in. Hg ft³/min
Before
After

TEST NUMBER **12**
DATE **12-20**
OPERATOR **JD**
FUEL
SITE **E**
PROBE LOCATION **BLP**

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ , %	Vac.
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Impingers		Meter			
								In	Out				
1		.08	1.5	4412.09	550	380	200		70	60			6.0
2		.065	1.2	4414.51	540	360	200		75	70			5.0
3		.04	.75	4416.56	500	180	200		80	70			3.8
4		.08	1.50	4419.35	480	250	220		70	70			6.0
1		.05	.95	4421.57	500	150	210		70	70			4.5
2		.06	1.10	4424.04	520	240	230		75	70			4.9
3		.04	.75	4426.09	500	140	220		80	70			4.0
4		.07	1.30	4428.67	500	250	230		80	72			5.0
1		.025	.46	4430.27	500	150	200		80	72			3.0
2		.03	.55	4431.99	520	235	230		78	72			3.2
3		.065	1.20	4434.49	500	140	210		80	72			5.0
4		.085	1.60	4437.41	500	280	220		70	72			—
1		.06	1.10	4439.76	500	150	215		72	72			4.9
2		.04	.75	4441.76	520	230	230		72	72			4.0
3		.06	1.10	4444.21	480	140	200		75	71			5.0
4		.08	1.50	4446.99	490	250	220		72	72			6.0
1		.07	1.30	4449.62	500	150	200		78	70			5.5
2		.095	1.80	4452.81	530	210	215		75	71			7.0
3		.045	.85	4455.00	500	160	210		80	71			4.3
4		.07	1.3	4457.56	500	270	220		78	71			5.5
1		.08	1.50	4460.40	550	150	215		85	70			6.1
2		.04	.75	4462.42	540	260	200		80	70			4.0
3		.05	.95	4464.68	500	150	200		88	70			4.9
4		.05	.95	4466.95	500	270	220		85	70			4.9
Average		.059	1.11	—	509	—	—						

METER VOL. END **4466.95**
START **4409.23**
SAMPLE VOL. **57.72** ft³

C _{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.82	28.48

Percent O₂ =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal) =
% H₂O = Noz(Actual) = **1.399 x 10⁻³ ft²**

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	162	100	62
#2	113	100	13
#3	0	0	0
Total			75
#4	g(End)	g(Start)	Δgrams
Silica Gel	160.2	148	12
Total Vol. H ₂ O			87 ml

PARTICULATE

DATA

Leak Stack Rate

0.246 - 98.7
 107 - 98.4

TEST NUMBER 12

Vac
 In. Hg ft/min

DATE 12-20-78

Sampling Time
 Per Point, Min.
 5

Before
 After

OPERATOR R. AR

FUEL CRUSHED

SITE E

FIELD LOCATION MECH

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂	Vac.
		Δ P _S	Δ H	Meter Reading	Stack	Probe	Oven	Inhibitors		Meter			
								In	Out				
Port # 1	9:50	.12	.16	4075.12	315	—	250		58	72			2.0
2		.13	.17	4076.73			280		53	72			2.0
3		.23	.37	4079.23			300		50	72			3.3
4		.46	.61	4092.26			290		50	71			5.0
5		.36	.48	4094.85	315	300	300		49	72			4.0
6		.29	.38	4087.28		300	300		50	77			3.2
Port # 3		0.00											
8		.04	.05	4088.14			250		50	78			2.0
9		.08	.10	4039.37			290		50	78			2.0
10		.06	.08	4090.46			300		50	80			2.0
11		.06	.08	4091.52			300		50	81			2.0
12		.04	.05	4092.43			310		50	81			2.0
Port # 4		.13	.17	4094.06			250		52	82			2.0
14		.48	.64	4097.17			290		52	82			5.3
15		.62	.88	4100.59			310		55	83			—
16		.62	.93	4104.06			315		55	88			7.0
17		.37	.49	4106.62			310		55	88			4.0
18		.09	.12	4108.01			300		53	90			2.0
Port # 1		1.20	.46	4110.59			250		55	90			4.0
20		1.60	.62	4113.61			290		56	90			5.2
21		1.90	.74	4116.96			300		56	90			6.2
22		1.90	.74	4120.22			300		56	90			6.2
23		1.90	.74	4123.47			300		56	90			6.2
24		1.10	.42	4125.905	✓		300		56	91			3.8
Average		.247	.40	36.352									18.818

.187

Paragraph Setup

METER VOL. END 4125.905
 START 4073.442
 SAMPLE VOL 55.170 cc

Stack Press. Barometric Pressure
 In. H₂O Gauge 28.48

Percent O₂ =

F_{meter} = C
 F_{stack} = T_{stack}
 T_{meter} = ΔP
 ΔHg = Noz(Ideal) =
 H₂O = 67 Noz(Actual) = .187

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	162	100	62
#2	106	100	6
#3	1	0	1
Total			

0 (End) 0 (Start) 0 (Start)
 Silica 159.0 - 149 = 11
 Total Vol. H₂O 80

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 101

TEST NUMBER 13

Vac in. Hg ft³/min

DATE 12-20-78

Sampling Time Per Point, Min
3

Before After

OPERATOR JD

FUEL Kent. Ind.

SITE E

PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ , %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
1		.09	1.7	4478.70	540	280	220		70	50		7.0
2		.04	.75	4480.81	520	360	240		70	55		4.0
3		.06	1.1	4483.29	480	120	260		78	60		5.0
4		.08	1.5	4486.19	460	260	190		70	60		6.8
1		.06	1.1	4488.61	500	160	220		80	70		5.0
2		.075	1.4	4491.33	500	300	230		70	70		6.2
3		.04	.75	4493.37	490	180	220		80	70		4.0
4		.08	1.5	4496.19	460	330	240		78	70		6.8
1		.04	.75	4498.20	480	200	230		90	70		4.2
2		.025	.46	4499.76	500	310	250		75	72		3.2
3		.05	.95	4502.06	480	190	240		80	70		5.0
4		.08	1.5	4504.87	470	340	250		75	75		7.0
1		.03	.55	4506.64	480	310	230		85	72		4.8
2		.03	.55	4508.41	480	320	260		79	73		4.8
3		.07	1.3	4511.08	480	210	250		80	72		6.6
4		.075	1.4	4513.78	460	310	240		78	72		6.8
1		.05	.95	4516.08	490	200	250		81	72		5.3
2		.06	1.1	4518.52	490	300	260		75	75		6.0
3		.04	.75	4520.55	470	200	250		80	78		4.8
4		.06	1.1	4523.07	470	330	260		75	78		6.0
1		.08	1.5	4525.87	500	150	295		80	78		8.0
2		.06	1.1	4528.25	500	300	290		75	78		6.0
3		.04	.75	4530.30	480	190	290		80	75		5.0
4		.06	1.1	4532.70	470	320	250		75	80		6.2
Average		0.057	1.07	57.11	486							

Nomograph Setup

METER VOL. END 4532.70
START 4475.59
SAMPLE VOL. 57.11 ft³

C _p tot	Stack Press. In. Hg-Gauge	Barometric Pressure
0.837	-.80" H ₂ O	28.53

Percent O₂ =

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz (Ideal) =
Δ H₂O = Noz (Actual) = 1.3909 x 10⁻³ ft³

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	145	100	45
#2	112	100	12
#3	2	0	2
Total			59
#4	g(End)	g(Start)	Agrams
Silica Gel	159	148	11
Total Vol. H ₂ O			70 ml

EXPIRATION DATE

DATA

Leak Check Rate

ISOTHERMICS =

TEST NUMBER 13

Sampling Time
Per. (Days, Min)
5.0

Vac
100 Hg ft³/min
Before
After

DATE 12-20-78
OPERATOR R.A.P.
FUEL CRUSHED
SITE E
PROBE LOCATION MESHOUT

.187 - 102.0
.246 - 93.8

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Inlet/Outlet		Meter		
1		1.1	.42	4128.97	315	270	250		50	62		4.0
2		1.7	.65	4132.23	320	300	250		51	63		5.8
3		1.9	.74	4135.59	315	290	250		52	68		6.3
4		1.9	.74	4138.99	310	290	270		53	71		-
5		1.6	.62	4142.14	315	300	280		53	72		5.3
6		1.10	.42	4144.64	315	300	290		52	74		3.8
7		0.00										
8		.04	.05	4145.53	310	250	280		50	79		4.0
9		.06	.08	4146.58	310	270	290		49	79		4.0
10		.07	.09	4147.75		290	310		50	80		4.0
11		.04	.05	4149.67		300	315		51	81		4.0
12		.04	.05	4149.58		280	300		51	85		4.0
13		.13	.17	4151.27		250	280		51	85		2.0
14		.39	.51	4153.98		280	285		52	88		4.3
15		.52	.67	4157.08		290	300		52	90		5.5
16		.48	.64	4160.14		290	300		52	92		5.4
17		.33	.43	4162.61		300	310		52	92		4.0
18		.03	.04	4163.34		280	310		52	92		4.0
19		.26	.34	4165.54		250	300		53	92		3.3
20		.38	.37	4167.80		280	300		55	94		3.3
21		.37	.43	4170.47		300	310		55	94		4.2
22		.46	.60	4173.41		300	315		55	97		5.3
23		.37	.48	4176.00		300	320		55	98		4.5
24		.34	.44	4178.532		290	315		55	98		4.2
Average		1.55/25	0.53	19.246/35.641		284						

METER CORR 1.0516

Temperature Secured

METER VOL. 4126.338
SAMPLE VOL. 100
Stack Trans. Temp. Gauge +1.9" H₂O
Per. (Days, Min) 28.48
Percent O₂ =

Pressure = C
P_{stack} = T_{stack}
T_{probe} = ΔP
ΔH_g = Noz (Ideal) =
H₂O = 64 Noz (Actual) =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	156	100	56
#2	108	100	8
#3		0	
Total			64
#4	g(End)	g(Start)	Grams
Silica	159	148	11
Total Vol. H ₂ O			75 ml

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 91.6

TEST NUMBER 14
 DATE 12-20-78
 OPERATOR JD
 FUEL Kent-Sud.
 SITE E
 PROBE LOCATION 240 out

Sampling Time
 Per Point, Min
3

Vac
 in. Hg ft³/min
 Before
 After

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F								
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter	O ₂ %	Vac.	
								In	Out				
1		.09	1.7	4540.39	560	280	140			90			7.1
2		.07	1.3	4542.93	540	360	150			90			5.8
3		.04	.75	4544.87	530	240	180			95			4.0
4		.09	1.7	4546.77	500	350	200			98			7.1
1		.06	1.1	4549.16	540	170	200			100			5.0
2		.07	1.3	4551.62	540	270	200			100			6.0
3		.06	1.1	4553.93	500	180	220			101			5.0
4		.08	1.5	4556.60	500	300	220			100			7.0
1		.04	.75	4558.51	520	180	220			105			4.0
2		.03	.55	4560.16	540	200	230			109			3.0
3		.07	1.3	4562.63	520	190	230			110			6.0
4		.09	1.7	4565.46	500	330	250			110			7.8
1		.06	1.1	4567.71	530	160	240			110			5.5
2		.05	.95	4569.84	540	260	255			110			5.0
3		.05	.95	4572.92	500	170	240			112			5.0
4		.09	1.7	4574.68	520	280	260			112			8.0
1		.06	1.1	4576.90	530	180	240			112			5.8
2		.09	1.7	4579.30	560	260	260			112			9.0
3		.05	.95	4581.38	500	180	240			118			6.0
4		.08	1.5	4584.98	520	300	250			117			9.0
1		.11	2.0	4587.41	570	150	250			118			12.0
2		.04	.75	4589.22	570	160	270			115			7.0
3		.06	1.1	4591.69	500	150	250			120			9.0
4		.08	1.5	4594.28	500	280	270			120			12.5
Average		.0725	1.31	56.83	526								

METER VOL. END 4594.28
 START 4537.45
 SAMPLE VOL. ft³
 Cpilot 0.87 Stack Press. -.02 H₂O Barometric Pressure 28.33
 Percent O₂ =

Nomograph Setup

P_{meter} = C =
 P_{stack} = T_{stack} =
 T_{meter} = ΔP =
 ΔHg = Noz(Ideal) =
 % H₂O = Noz(Actual) = $1.3909 \times 10^{-3} \text{ g}^2$

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	172	160	72
#2	114	160	14
#3	1	0	1
Total			87
#4	g(End)	g(Start)	Δgrams
Silica Gel	159	148	11
Total Vol. H ₂ O			98 ml

PARTICIPATE

DATA

Break Check Date

DEFINITION =

.187-103
.246-1024 118.7

TRAC NUMBER

14

DATE

12-20-75

ADDRESS

K.A.I.

PROD.

CRUSHED COA

SITE

E

FIELD LOCATION: MICH OUT

Supply Line Time Per Point, Min
5

Before
After

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	BYPASSERS		Meter			
								In	Out				
Part # 1		.22	.29	4181.00		260	290		52	50			3.3
2		.18	.22	4183.00		280	305		52	50			3.0
3		.41	.54	4185.98		280	300		52	51			6.0
4		.56	.74	4189.46		280	310		52	55			8.2
5		.48	.64	4192.63		280	310		52	59			7.1
6		.42	.55	4195.58	320	280	310		52	60			5.9
Part # 4		.14	.18	4197.36	320	240	280		50	60			2.2
8		.42	.55	4200.30	315	270	290		50	60			5.0
9		.59	.77	4203.69		280	300		50	61			7.0
10		.52	.67	4206.95		280	310		51	62			6.2
11		.37	.48	4209.64		280	315		51	67			4.7
12		.11	.14	4211.28		270	310		51	68			2.0
Part # 3		.00											
14	6.1	.06	.08	4212.78									
15		.10	.13	4214.41	315	260	290		52	68			2.2
16		.15	.20	4216.30		280	310		50	62			2.5
17		.08	.10	4217.57		270	310		50	68			2.0
18		.04	.05	4218.58	320	270	310		50	68			42.0
Part # 1		1.1	.42	4221.29		240	280		50	67			4.8
20		1.6	.60	4224.36		270	290		50	66			6.2
21		1.8	.70	4227.59		270	290		50	63			7.1
22		1.9	.74	4231.12		270	240		50	69			7.7
23		1.60	.60	4234.11		270	240		50	70			6.0
24		1.20	.46	4236.713		260	250		50	70			5.0
Average		0.25 1.53	0.43	60952 41.883 19.004	318								

.246

.187

METER VOL.	END	START
	4178.752	
SAMPLE VOL.		cc
C _{pitot}	Stack Press. In. H ₂ O	Barometric Pressure
.837	+1.8" H ₂ O	28.38
Percent O ₂		

Micrograph Setup
 P_{meter} = C =
 P_{stack} = T_{stack} =
 T_{meter} = ΔP =
 ΔH_g = Noz(Ideal) =
 % H₂O = 7.7 Noz(Actual) =

Imp.	Vol. (End)	Vol. (Start)	(Vol. (ml))
#1	180	150	30
#2	110	100	10
#3	1	0	1
Total			91
#4	g(End)	g(Start)	grams
Silica gel	159	148	11
Total Vol. H ₂ O			102 ml

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS = 100.4

TEST NUMBER 15

DATE 1-15-77

OPERATOR J.S.

FUEL

SITE E

PROBE LOCATION Boiler exit

Sampling Time Per Point, Min
3

Vac
in. Hg ft³/min
Before
After

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ %	Vac.
		Δ P _s	Δ H	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
Port 6		.10	1.9	4603.16	560	100	190		68	65		7.2
2		.05	.94	4605.37	560	150	180		80	63		4.3
3		.08	1.5	4608.30	500	180	180		72	63		5.8
4		.08	1.5	4611.06	500	360	240		80	65		6.0
Port 5		.07	1.2	4613.79	520	100	200		70	69		5.0
2		.16	1.9	4616.34	560	140	220		70	70		7.2
3		.06	1.1	4618.85	540	250	220		80	70		4.9
4		.095	1.75	4621.73	—	330	220		80	71		6.8
Port 4		.06	1.1	4624.07	530	100	220		80	78		4.9
2		.05	.94	4626.24	560	120	250		80	78		4.3
3		.07	1.2	4628.61	—	150	230		80	80		5.2
4		.09	1.7	4631.43	—	340	250		80	81		7.0
Port 3		.03	.55	4633.12	530	100	240		80	82		3.5
2		.04	.75	4635.07	540	120	270		80	82		4.0
3		.095	1.75	4638.11	—	200	250		—	82		7.0
4		.095	1.75	4640.94	—	340	270		—	82		7.0
Port 2		.06	1.1	4643.25	560	100	200		—	80		5.0
2		.10	1.9	4646.24	560	150	270		—	89		8.0
3		.06	1.1	4648.50	—	180	260		—	87		5.2
4		.10	1.9	4651.45	—	330	280		—	89		8.1
Port 1		.10	1.9	4654.38	600	110	270		—	90		8.0
2		.10	1.9	4657.33	600	150	280		—	90		8.0
3		.06	1.1	4659.59	—	180	260		—	90		5.5
4		.10	1.9	4662.51	—	330	280		—	90		8.2
Average				(.077)	(1.43)		547					
							1007A					

Nomograph Setup

METER VOL. END 416.25
START 460.22
SAMPLE VOL. 62.51 ft³

C _{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
1.57		29.83

Percent O₂ =

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal) =
% H₂O = 3.0 Noz(Actual) =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	172	100	72
#2	116	100	16
#3	1	0	1
Total			89

	g(End)	g(Start)	Δgrams
#4 Silica Gel	153	143	10
Total Vol. H₂O			49 ml

PARTICULATE

DATA

Leak Check Rate

ISOKINETICS =

.137 - 105.2
.246 - 115.4

TEST NUMBER

DATE

OPERATOR

FUEL

SITE

PROBE LOCATION

Sampling Time Per Point, Min

Vac
in. Hg ft³/min
Before
After

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ , %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
1		1.2	.46	4239.71		250	250		32	42		5.3
2		1.6	.61	4242.87	315	250	250		38	42		7.1
3		2.1	.80	4246.45		250	260		42	48		10.0
4		2.2	.84	4250.08		270	250		42	48		10.2
5		1.9	.73	4253.46		260	260		42	48		8.8
6		1.3	.50	4256.24		260	260		42	50		5.5
7		1.0										
8		1.2	.03	4257.22		240	270		38	48		42.0
9		1.7	.16	4258.91		260	270		33	48		2.2
10		1.1	.16	4260.58		270	280		33	49		2.2
11		1.5	-.06	4261.65		260	280		32	50		42.0
12		1.0										
13		1.1	.14	4263.38		250	280		33	48		2.1
14		1.4	.57	4266.39	315	270	290		38	48		5.8
15		1.6	.81	4269.84		280	290		40	50		8.5
16		1.5	.78	4273.35		280	300		40	52		8.2
17		1.3	.49	4276.05		270	300		38	52		5.0
18		1.0	.10	4277.41		260	300		35	52		—
19		1.2	.34	4279.74		240	240		38	52		4.0
20		1.2	.34	4282.19		270	260		40	52		4.0
21		1.2	.35	4284.54		250	250		40	52		4.5
22		1.3	.41	4287.20		260	240		40	52		5.2
23		1.3	.38	4289.59		260	240		38	53		4.6
24		1.2	.29	4291.74		260	240		37	53		3.8
Average												

METER SERIAL No. 510

Nomograph Setup

METER VOL.	END	412.11.7
	START	412.04.122
SAMPLE VOL.		7.20 ft ³

C _p tot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		

Percent O₂ =

P _{meter} =	C	=	Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
P _{stack} =	T _{stack}	=	#1	100	100	0
T _{meter} =	ΔP	=	#2	100	100	0
ΔHg =	Noz (Ideal) =		#3			
% H ₂ O =	Noz (Actual) =					
						Total 81
			#4	g(End)	g(Start)	Δgrams
			Silica	5.8	1.13	4.67
			Gel			
						Total Vol. H ₂ O 91 ml

PARTICULATE

DATA

Leak Check Rate

ISCKINETICS = 46.8

TEST NUMBER 20

Vac
in. Hg ft³/min

DATE 1-19-71

Sampling Time
Per Point, Min
3

Before
After

OPERATOR JD

FUEL

SITE E

PROBE LOCATION Bu loc

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F							O ₂ , %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter			
								In	Out				
Port #2 1		.08	1.5	4684.37	530	100	180			50			6.2
2		.03	.65	4686.14	520	150	180			51			3.6
3		.04	.75	4688.14		150	180			51			4.0
4		.055	1.0	4690.43		310	140			51			5.0
Port #5 1		.07	1.3	4692.44	500	110	200			55			5.9
2		.10	1.4	4696.15	520	130	220			55			8.0
3		.05	.94	4698.43		150	200			55			5.0
4		.10	1.9	4701.56		300	220			55			8.2
Port #4 1		.06	1.1	4703.45	500	100	220			55			5.5
2		.04	.75	4705.03	500	130	220			58			4.6
3		.11	2.0	4709.29		250	230			60			9.2
4		.10	1.9	4712.35		350	240			60			9.0
Port #3 1		.04	.75	4714.35	520	120	230			60			9.8
2		.04	.75	4716.38	540	140	230			60			4.8
3		.10	1.9	4719.48		180	230			60			9.0
4		.12	2.2	4722.81		320	250			60			7.0
Port #2 1		.06	1.1	4725.20	540	110	240			60			6.0
2		.04	1.7	4728.10	540	130	240			60			8.1
3		.06	1.1	4730.48		140	240			60			6.0
4		.10	1.9	4733.55		300	250			60			9.8
Port #1 1		.10	1.9	4736.66	560	110	250			60			9.5
2		.09	1.7	4739.56	550	160	250			60			8.8
3		.12	2.2	4742.89		140	230			60			11.5
4		.13	2.4	4746.30		310	250			60			12.0
Average		0.074	1.466		527								

Nomograph Setup

METER VOL. END 4746.30
START 4681.61
SAMPLE VOL. 64.69 ft³

C _p pitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	.827 H ₂ O	29.65

Percent O₂ =

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz (Ideal) =
Δ H₂O = 4.8 Noz (Actual) =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	144	100	44
#2	112	100	12
#3		0	
Total			56
#4	g(End)	g(Start)	Grams
Silica Gel	160	148	12
Total Vol. H ₂ O			68 ml

PARTICULATE

DATA

Leak Check Rate

ISOMETRICS = 105.7/98.3

TEST NUMBER 20

Vac in. Hg ft³/min

DATE 1-18-77

Sampling Time Per Point, Min
5

Before After

OPERATOR RAR

FUEL

SITE E

PROBE LOCATION MELT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O ₂ , %	Vac.
		ΔP _s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
PART 1	246	.17	.22	4294.53		252	280		30	40		-
2		.16	.21	4296.52		260	290		30	43		3.3
3		.36	.47	4299.32		265	290		30	45		6.1
4		.43	.57	4302.29		270	302		32	50		7.2
5		.38	.50	4305.01		270	305		33	50		6.1
6		.37	.49	4307.75		270	315		34	51		6.1
PART 1		.03	.04	4308.74		240	300		30	52		22.0
2		.07	.09	4310.12		255	300		30	52		22.0
3	3:30	.11	.14	4311.66	328	270	300		31	55		2.2
4		.13	.17	4313.40		270	300		32	58		2.4
5		.08	.10	4314.53		270	320		32	58		22.0
6		.07	.09	4315.76		270	310		32	58		22.0
PART 1		.14	.16	4317.53		250	290		30	55		2.7
2		.72	.95	4321.30		275	300		35	58		12.0
* 3	1:27	.84	.32	4323.55		245	300		33	58		4.5
4		.81	.31	4325.73		270	295		32	58		4.1
5		.46	.17	4327.41		275	300		32	58		2.7
6		.06	.02	4328.04	336	270	300		32	60		22.0
PART 1		1.5	.57	4331.06		260	310		32	60		7.1
2		1.8	.67	4334.28		270	310		32	54		8.0
3		2.0	.75	4337.59		270	300		33	60		9.0
4		2.1	.80	4341.08		275	300		35	60		10.3
5		2.0	.75	4341.62		270	300		38	62		9.3
6		1.3	.49	4347.368		270	305		38	63	1	6.0
Average		.23	.317	30.275	332							
		1.28		27.413	332							

Nomograph Setup

METER VOL. END 4347.366
START 4292.516
SAMPLE VOL. 57.686 ft³

C _p tot	Stack Press. In. Hg-Gauge	Barometric Pressure
	1.1472	29.65

Percent O₂ =

Pmeter	T _{stack}	ΔP	Noz (Ideal)	Noz (Actual)	Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
C					#1	152	100	52
					#2	114	100	14
					#3	1	0	1
					Total			67

METER CURR 1.0516
1.246
c(End) 155
c(Start) 1418
7
Total Vol. H₂O 74 ml

PARTICULATE LAB WORKSHEET

TEST NO. 2 ^{BLR OUT} (Inlet, Outlet) LOCATION Sik E
 Date 11-17-78 Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

		Impinger Water Vol (ml)			
		1	2	3	Total
Final					
Initial					
Δ Vlc					

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	1	
BEAKER NO.		7	1	—	
DATE WT.		—	—	11-17-78	
TARE WT.	1	104.3522	49.6409	.6746	
	2	104.3518	49.6402	.6751	
	3	104.3519	49.6402	.6750	
	4	—	—	—	
AVG.		104.3519	49.6404	.6749	

POST TEST WTS.

	1	104.4768	51.4991	.7410	
	2	104.4763	51.4995	.7411	
	3	104.4765	51.5004	.7421	
	4	—	—	—	
AVG.		104.4768	51.4997	.7411	
Δ WT.		0.1249	1.8593	0.0662	

Δ Vlc = _____ ml LOAD _____ klb/hr
 Δ DgV = _____ ft³ O₂ _____ %
 Δ Mn 2050.4 mgm REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 2 *Economizer* (Inlet, Outlet) LOCATION Site E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

		Impinger Water Vol (ml)			
		1	2	3	Total
Final	_____				
Initial	_____				
Δ Vlc	_____				

CONTENT		H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		X	—	—	4	X
BEAKER NO.			6	2	—	
DATE WT.			—	—	11-17-78	
TARE WT.	1		95.5711	50.1589	.7930	
	2		95.5714	50.1584	.7931	
	3	95.5714	50.1589	.7931		
	4	—	—	—		
AVG.		95.5713	50.1587	.7931		

POST TEST WTS.

1	X	95.6597	53.7064	.9201	X
2		95.6588	53.7073	.9194	
3		95.6587	53.7074	.9210	
4		—	—	—	
AVG.		95.6591	53.7070	.9197	
Δ WT.		0.0878	3.5483	0.1266	

Δ Vlc = _____ ml LOAD _____ klb/hr
 Δ DgV = _____ ft³ O₂ _____ %
 Δ Mn 3762.7 mgm REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 3 **BLROUT** (Inlet, Outlet) LOCATION Sik E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

1	2	3	Total

Final _____
 Initial _____
 Δ Vlc _____

CONTENT		H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		X	—	3	3	X
BEAKER NO.			5	11-19-78	—	
DATE WT.			—	—	—	
TARE WT.	1		102.1463	64.5806	.6838	
	2		102.1465	64.5808	.6839	
	3	102.1465	64.5809	.6839		
	4	—	—	—		
AVG.		102.1464	64.5808	.6839		

POST TEST WTS.

	1	X	102.2783	67.0681	.7729	X
	2		102.2781	67.0688	.7731	
	3		102.2787	67.0688	.7732	
	4		—	—	—	
AVG.			102.2784	67.0686	.7731	
Δ WT.		0.1320	2.4878	0.0892		

Δ Vlc = _____ ml LOAD _____ klb/hr
 Δ DgV = _____ ft³ O₂ _____ %
 Δ Mn = 2709.0 mgm REMARKS: _____

PARTICULATE LAB WORKSHEET

MECH OUT

TEST NO. 3 (Inlet, Outlet) LOCATION Sik E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.	X	—	—	6	X
BEAKER NO.		8	4	—	
DATE WT.		—	11-19-78	—	
TARE WT. 1		95.0097	63.5500	.8511	
2		95.0092	63.5501	.8512	
3	95.0093	63.5503	.8511		
4	—	—	—		
AVG.		95.0094	63.5501	.8511	

POST TEST WTS.

1	X	95.1544	63.5822	.9736	X
2		95.1543	63.5819	.9732	
3		95.1540	63.5816	.9732	
4		—	—	—	
AVG.			95.1542	63.5819	
Δ WT.		0.1448	0.0318	0.1222	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn = 288.8 mgm

LOAD _____ klb/hr
 O₂ _____ %
 REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 4 ^{BLR OUT} (Inlet, Outlet) LOCATION S. & E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		13	9	5	
DATE WT.		12-11-78	—	—	
TARE WT.	1	95.6498	64.0624	.6619	
	2	95.6502	64.0629	.6619	
	3	95.6504	64.0627	.6620	
	4	—	—	—	
AVG.		95.6501	64.0626	.6619	

POST TEST WTS.

	1	95.7943	72.4193	.7933	
	2	95.7935	72.4185	.7937	
	3	95.7933	72.4192	.7940	
	4	—	—	—	
AVG.		95.7937	72.4190	.7937	
Δ WT.		0.1436	0.3564	0.1318	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn = 0631.8 mgm

LOAD _____ klb/hr
 O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 4 ^{MECH} (Inlet, Outlet) LOCATION Site E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		14	10	8	
DATE WT.		—	—	—	
TARE WT.	1	95.9788	69.0062	.8460	
	2	95.9792	69.0064	.8459	
	3	95.9791	69.0065	.8461	
	4	—	—	—	
AVG.		95.9790	69.0064	.8460	

POST TEST WTS.

	1	96.1181	69.0402	1.0459	
	2	96.1180	69.0403	1.0464	
	3	96.1180	69.0399	1.0462	
	4	—	—	—	
AVG.		96.1180	69.0401	1.0462	
Δ WT.		0.1390	0.0337	0.2002	

Δ Vlc = _____ ml LOAD _____ klb/hr
 Δ DgV = _____ ft³ O₂ _____ %
 Δ Mn 372.9 mgm REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 5 ^{BLR OUT} (Inlet, Outlet) LOCATION S. K. E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

		Impinger Water Vol (ml)			
		1	2	3	Total
Final	_____				
Initial	_____				
Δ Vlc	_____				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		15	11	7	
DATE WT.		—	—	—	
TARE WT.	1	97.7677	69.5598	.6763	
	2	97.7681	69.5605	.6762	
	3	97.7673	69.5608	.6762	
	4	—	—	—	
AVG.		97.7677	69.5604	.6762	

POST TEST WTS.

	1	97.9243	77.2277	.8066	
	2	97.9246	77.2274	.8071	
	3	97.9245	77.2282	.8070	
	4	—	—	—	
AVG.		97.9245	77.2278	.8069	
Δ WT.		.1568	7.6674	.1307	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 7954.9 mgm

LOAD _____ klb/hr
 O₂ _____ %
 REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 5 *NECH OUT* (Inlet, Outlet) LOCATION SKE
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		16	12	10	
DATE WT.		—	—	—	
TARE WT.	1	97.0280	67.8369	.8410	
	2	97.0274	67.8371	.8411	
	3	97.0268	67.8373	.8413	
	4	—	—	—	
AVG.		97.0274	67.8371	.8411	

POST TEST WTS.

	1	97.1869	67.8587	1.0481	
	2	97.1867	67.8587	1.0484	
	3	97.1870	67.8575	1.0496	
	4	—	—	—	
AVG.		97.1869	67.8583	1.0484	
Δ WT.		0.1595	0.0212	0.2073	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 388.0 mgm

LOAD _____ klb/hr
 O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 6 ^{BLR OUT} (~~Inlet, Outlet~~) LOCATION SIDE
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		17	23	9	
DATE WT.		—	—	—	
TARE WT.	1	104.3541	50.1588	.6696	
	2	104.3544	50.1591	.6691	
	3	104.3544	50.1592	.6695	
	4	—	—	—	
AVG.		104.3543	50.1590	.6694	

POST TEST WTS.

	1	104.4988	58.1055	.8281	
	2	104.4989	58.1055	.8284	
	3	104.4990	58.1060	.8277	
	4	—	—	—	
AVG.		104.4989	58.1056	.8281	
Δ WT.		0.1446	7.9466	0.1587	

Δ Vlc = _____ ml LOAD _____ klb/hr
 Δ DgV = _____ ft³ O₂ _____ %
 Δ Mn 8249.9 mgm REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 6 ^{MECH} (Inlet, Outlet) LOCATION _____
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		18	24	12	
DATE WT.		—	—	—	
TARE WT.	1	95.0121	49.6411	.8502	
	2	95.0127	49.6414	.8498	
	3	95.0128	49.6413	.8503	
	4	—	—	—	
AVG.		95.0125	49.6413	.8501	

POST TEST WTS.

	1	95.3942	50.4749	1.1277	
	2	95.3945	50.4748	1.1279	
	3	95.3943	50.4750	1.1270	
	4	—	—	—	
AVG.		95.3943	50.4749	1.1275	
Δ WT.		0.3818	0.8336	1.1275	

0.2774

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 497.6 mgm

LOAD _____ klb/hr
 O₂ _____ %
 REMARKS: _____

PARTICULATE LAB WORKSHEET

BLR CNT

TEST NO. 7 (Inlet, Outlet) LOCATION Side E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

Final _____
 Initial _____
 Δ Vlc _____

Impinger Water Vol (ml)			
1	2	3	Total
 	 	 	
 	 	 	
 	 	 	

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.	 	—	—	—	
BEAKER NO.	 	19	21	11	
DATE WT.	 	—	—	—	
TARE WT.	1	95.5738	64.5826	.6832	
	2	95.5738	64.5828	.6836	
	3	95.5740	64.5829	.6835	
	4	—	—	—	
AVG.	 	95.5739	64.5828	.6834	

POST TEST WTS.

	1	95.7711	75.0436	.8618	
	2	95.7702	75.0436	.8619	
	3	95.7695	75.0449	.8619	
	4	—	—	—	
AVG.	 	95.7703	75.0436	.8619	
Δ WT.	 	0.1964	10.4608	0.1785	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 10,035.7 mgm

LOAD _____ klb/hr
 O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 7 ^{MECH OUT} (Inlet, Outlet) LOCATION Side E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

		Impinger Water Vol (ml)			
		1	2	3	Total
Final					
Initial					
Δ Vlc					

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.	X	—	—	—	X
BEAKER NO.		20	22	14	
DATE WT.		—	—	—	
TARE WT. 1		102.1494	63.5527	.7526	
2		102.1493	63.5524	.7529	
3		102.1494	63.5525	.7528	
4	—	—	—		
AVG.		102.1494	63.5525	.7528	

POST TEST WTS.

1	X	102.6101	65.9574	1.1187	X	
2		102.6101	65.9571	1.1177		
3		102.6100	65.9575	1.1168		
4		—	—	—		
AVG.			102.6101	65.9573		1.1177
Δ WT.			0.4607	2.4048		0.3649

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 3230.4 mgm

LOAD _____ klb/hr
 O₂ _____ %
 REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 8 **BLRGT** (Inlet, Outlet) LOCATION Side E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		29	25	13	
DATE WT.		—	—	—	
TARE WT.	1	97.7687	69.5619	.6029	
	2	97.7688	69.5618	.6030	
	3	97.7689	69.5617	.6029	
	4	—	—	—	
AVG.		97.7688	69.5618	.6029	

POST TEST WTS.

	1	97.8947	76.5926	.7461	
	2	97.8941	76.5932	.7459	
	3	97.8953	76.5933	.7451	
	4	—	—	—	
AVG.		97.8947	76.5930	.7457	
Δ WT.		0.1259	7.0312	0.1428	

Δ Vlc = _____ ml LOAD _____ klb/hr
 Δ DgV = _____ ft³ O₂ _____ %
 Δ Mn 7299.9 mgm REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 8 MECH (Inlet, Outlet) LOCATION Sik E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

Final _____
 Initial _____
 Δ Vlc _____

1	2	3	Total

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.	X	—	—	—	X	
BEAKER NO.		30	26	15		
DATE WT.		—	—	—		
TARE WT.		1	95.9797	64.0624		.7886
		2	95.9805	64.0630		.7888
		3	95.9803	64.0629		.7888
	4	—	—	—		
AVG.		95.9802	64.0628	.7887		

POST TEST WTS.

	X	1	96.0818	64.0726	.9672	X	
		2	96.0818	64.0729	.9669		
		3	96.0819	64.0724	.9661		
		4	—	—	—		
AVG.			96.0818	64.0726	.9667		
Δ WT.			0.1016	0.0098	0.1780		

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn = 289.4 mgm

LOAD _____ klb/hr
 O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 9 BLA OUT

LOCATION Side E

Date _____

Box No. _____

Eng. _____

Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		31	27	20	
DATE WT.		—	—	—	
TARE WT.	1	95.6512	69.0072	.6147	
	2	95.6513	69.0074	.6147	
	3	95.6517	69.0075	.6148	
	4	—	—	—	
AVG.		95.6516	69.0074	.6147	

POST TEST WTS.

	1	95.7926	74.8236	.7672	
	2	95.7925	74.8241	.7665	
	3	95.7923	74.8243	.7668	
	4	—	—	—	
AVG.		95.7925	74.8240	.7668	
Δ WT.		0.1409	5.8166	0.1521	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 6109.6 mcgm

LOAD _____ klb/hr
 O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 9 ^{MECH} LOCATION Six E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

1	2	3	Total
 	 	 	
 	 	 	
 	 	 	

 Final _____
 Initial _____
 Δ Vlc _____

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.	 	—	—	—	
BEAKER NO.	 	32	28	21	
DATE WT.	 	—	—	—	
TARE WT.	1	97.0273	67.8390	.7353	
	2	97.0275	67.8391	.7354	
	3	97.0278	67.8391	.7354	
	4	—	—	—	
AVG.	 	97.0275	67.8391	.7354	

POST TEST WTS.

1	 	97.3243	68.1735	.9626	
2	 	97.3243	68.1738	.9621	
3	 	97.3240	68.1727	.9624	
4	 	—	—	—	
AVG.	 	97.3242	68.1733	.9624	
Δ WT.	 	0.2967	0.3342	0.2270	

Δ Vlc = _____ ml LOAD _____ klb/hr
 Δ DgV = _____ ft³ O₂ _____ %
 Δ Mn = 857.9 mgm REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 11 *BLR OUT* LOCATION Sike
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ Dgv _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		36	29	22	
DATE WT.		—	—	—	
TARE WT.	1	97.7670	63.5531	.6108	
	2	97.7672	63.5533	.6110	
	3	97.7671	63.5535	.6110	
	4	—	—	—	
AVG.		97.7671	63.5533	.6109	

POST TEST WTS.

1		97.9218	70.6048	.7803	
2		97.9205	70.6034	.7800	
3		97.9214	70.6026	.7803	
4		—	—	—	
AVG.		97.9212	70.6036	.7802	
Δ WT.		0.1541	7.0503	.1693	

Δ Vlc = _____ ml
 Δ Dgv = _____ ft³
 Δ Mn 7373.7 mgm

LOAD _____ klb/hr
 O₂ _____ %
 REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 11 *MECH* LOCATION Side E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			37	30	23	
DATE WT.			—	—	—	
TARE WT.	1		95.9785	69.5626	.7924	
	2		95.9783	69.5621	.7926	
	3		95.9786	69.5628	.7928	
	4		—	—	—	
AVG.			95.9785	69.5625	.7926	

POST TEST WTS.

1		96.6206	71.2454	1.1273		
2		96.6196	71.2457	1.1261		
3		96.6205	71.2458	1.1259		
4		—	—	—		
AVG.			96.6202	71.2456	1.1264	
Δ WT.			0.6417	1.6831	0.3338	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 2658.6 mgm

LOAD _____ klb/hr
 O₂ _____ %
 REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 12 BLR onr

LOCATION S. L. E

Date _____

Box No. _____

Eng. _____

Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

	Impinger Water Vol (ml)			
	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			38	31	24	
DATE WT.			—	—	—	
TARE WT.	1		97.0259	64.5837	.5987	
	2		97.0260	64.5843	.5989	
	3		97.0260	64.5843	.5988	
	4		—	—	—	
AVG.			97.0260	64.5841	.5988	

POST TEST WTS.

	1		97.1748	70.8226	.7380	
	2		97.1743	70.8226	.7382	
	3		97.1743	70.8216	.7385	
	4		—	—	—	
AVG.			97.1745	70.8223	.7382	
Δ WT.			0.1485	6.2382	0.1394	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 6526.1 mgm

LOAD _____ klb/hr
 O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO: 12 *MECH*

LOCATION Sike

Date _____

Box No. _____

Eng. _____

Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		39	32	25	
DATE WT.		—	—	—	
TARE WT.	1	95.0097	50.1595	.7852	
	2	95.0098	50.1592	.7857	
	3	95.0096	50.1596	.7855	
	4	—	—	—	
AVG.		95.0097	50.1594	.7855	

POST TEST WTS.

	1	95.7563	52.2022	1.1145	
	2	95.7553	52.2008	1.1147	
	3	95.7555	52.2002	1.1136	
	4	—	—	—	
AVG.		95.7557	52.2011	1.1143	
Δ WT.		0.7460	2.0417	.3208	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 3116.5 mgm

LOAD _____ klb/hr
 O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 13 ^{BLR OUT}

LOCATION Side E

Date _____

Box No. _____

Eng. _____

Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

Final _____
 Initial _____
 Δ Vlc _____

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		40	33	26	
DATE WT.		—	—	—	
TARE WT.	1	95.6490	49.6418	.6448	
	2	95.6491	49.6425	.6452	
	3	95.6493	49.6424	.6451	
	4	—	—	—	
AVG.		95.6491	49.6422	.6450	

POST TEST WTS.

	1	95.7827	54.5368	.8014	
	2	95.7823	54.5356	.8023	
	3	95.7827	54.5346	.8019	
	4	—	—	—	
AVG.		95.7826	54.5357	.8019	
Δ WT.		0.1335	4.8935	0.1569	

Δ Vlc = _____ ml

LOAD _____ klb/hr

Δ DgV = _____ ft³

O₂ _____ %

Δ Mn 5103.9 mgm

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 13 MECH

LOCATION _____

Date _____

Box No. _____

Eng. _____

Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

Final _____
 Initial _____
 Δ Vlc _____

Impinger Water Vol (ml)			
1	2	3	Total
 	 	 	
 	 	 	
 	 	 	

CONTENT		H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		 	—	—	—	
BEAKER NO.		 	41	34	27	
DATE WT.		 	—	—	—	
TARE WT.	1	 	95.5720	64.0641	.7375	
	2	 	95.5718	64.0638	.7380	
	3	 	95.5713	64.0639	.7379	
	4	 	—	—	—	
AVG.		 	95.5717	64.0639	.7378	

POST TEST WTS.

1	 	96.1343	65.1751	1.0101	 	
2	 	96.1336	65.1753	1.0106	 	
3	 	96.1339	65.1749	1.0101	 	
4	 	—	—	—	 	
AVG.		 	96.1339	65.1751	1.0103	
Δ WT.		 	0.5622	1.1112	0.2725	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 7945.9 mgm

LOAD _____ klb/hr
 O₂ _____ %
 REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 14 *BLR OUT* LOCATION Sike
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

Final _____
 Initial _____
 Δ Vlc _____

Impinger Water Vol (ml)			
1	2	3	Total
 	 	 	
 	 	 	
 	 	 	

CONTENT		H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		 	—	—	—	
BEAKER NO.		 	42	44	28	
DATE WT.		 	—	—	—	
TARE WT.	1	 	104.3521	50.2977	.6006	
	2	 	104.3516	50.2977	.6010	
	3	 	104.3516	50.2978	.6009	
	4	 	—	—	—	
AVG.		 	104.3518	50.2977	.6008	

POST TEST WTS.

	1	 	104.6092	63.1684	.8737	
	2	 	104.6085	63.1669	.8736	
	3	 	104.6091	63.1674	.8736	
	4	 	—	—	—	
AVG.		 	104.6089	63.1676	.8736	
Δ WT.		 	0.2571	12.8699	0.2728	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 13399.8 mgm

LOAD _____ klb/hr

O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 14 ^{MECH} LOCATION Sike E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)
 Final _____
 Initial _____
 Δ DgV _____

		Impinger Water Vol (ml)			
		1	2	3	Total
Final	_____				
Initial	_____				
Δ Vlc	_____				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		43	45	29	
DATE WT.		—	—	—	
TARE WT.	1	102.1463	50.3059	.7909	
	2	102.1459	50.3062	.7912	
	3	102.1401	50.3063	.7911	
	4	—	—	—	
AVG.		102.1461	50.3061	.7911	

POST TEST WTS.

	1	103.3192	56.1989	1.2893	
	2	103.3181	56.1981	1.2872	
	3	103.3191	56.1990	1.2855	
	4	—	—	—	
AVG.		103.3188	56.1987	1.2873	
Δ WT.		1.1727	5.8926	0.4962	

Δ Vlc = _____ ml LOAD _____ klb/hr
 Δ DgV = _____ ft³ O₂ _____ %
 Δ Mn = 7561.5 mgm REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 15 ^{BLK OUT} (Inlet, Outlet) LOCATION SITE E
 Date _____ Box No. _____ Eng. _____
 Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

Final _____
 Initial _____
 Δ Vlc _____

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.					
BEAKER NO.		46	48	31	
DATE WT.					
TARE WT.	1	104.4604	50.1582	.6976	
	2	104.4589	50.1580	.6977	
	3	104.4609	50.1587	.6975	
	4				
AVG.		104.4601	50.1583	.6976	

POST TEST WTS.

	1	104.7975	61.0005	.8676	
	2	104.7980	61.0012	.8683	
	3	104.7973	61.0010	.8676	
	4				
AVG.		104.7976	61.0009	.8678	
Δ WT.		0.3375	10.8426	0.1702	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 11350.3 mgm

LOAD _____ klb/hr
 O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. MCC15

LOCATION SIDE

Date _____

Box No. _____

Eng. _____

Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

Final _____
 Initial _____
 Δ Vlc _____

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.					
BEAKER NO.		47	49	32	
DATE WT.					
TARE WT.	1	105.2133	49.6406	.7406	
	2	105.2124	49.6409	.7408	
	3	105.2137	49.6411	.7404	
	4				
AVG.		105.2131	49.6409	.7406	

POST TEST WTS.

1	105.8302	52.0333	1.1165
2	105.8312	52.0338	1.1168
3	105.8309	52.0337	1.1158
4			
AVG.	105.8308	52.0336	1.1164
Δ WT.	0.6177	2.3927	0.3758

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn 3386.2 mgm

LOAD _____ klb/hr

O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 20 *BLR 01T*

LOCATION Side E

Date _____

Box No. _____

Eng. _____

Test Description _____

Dry Gas Meter Vol (ft³)

Final _____
 Initial _____
 Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		52	50	33	
DATE WT.		—	—	—	
TARE WT.	1	102.1503	49.6413	.6883	
	2	102.1494	49.6411	.6810	
	3	102.1496	49.6411	.6810	
	4	—	—	.6811	
AVG.		102.1498	49.6412	.6810	

POST TEST WTS.

	1	102.3663	58.8387	.8917	
	2	102.3661	58.8386	.8914	
	3	102.3658	58.8389	.8915	
	4	—	—	—	
AVG.		102.3661	58.8387	.8915	
Δ WT.		0.2163	9.1975	0.2105	

Δ Vlc = _____ ml
 Δ DgV = _____ ft³
 Δ Mn = 9624.3 mgm

LOAD _____ klb/hr
 O₂ _____ %

REMARKS: _____

PARTICULATE LAB WORKSHEET

TEST NO. 70 *MECH*

LOCATION S. J. E.

Date _____

Box No. _____

Eng. _____

Test Description _____

Dry Gas Meter Vol (ft³)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT	H ₂ O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.		—	—	—	
BEAKER NO.		53	51	34	
DATE WT.		—	—	—	
TARE WT.	1	95.9822	50.2983	.8236	
	2	95.9816	50.2982	.8243	
	3	95.9814	50.2982	.8240	
	4	—	—	—	
AVG.		95.9817	50.2982	.8240	

POST TEST WTS.

1		96.7721	52.3999	1.2532	
2		96.7701	52.3997	1.2526	
3		96.7696	52.3994	1.2524	
4		—	—	—	
AVG.		96.7706	52.3997	1.2527	
Δ WT.		0.7889	2.1015	0.4287	

Δ Vlc = _____ ml

Δ DgV = _____ ft³

Δ Mn = 337.1 mgm

4507.8

10.9887 — *from combustibles*
 3.0402
 LOAD TEST klb/hr

O₂ _____ %

REMARKS: _____

SECTION 3.0
GASEOUS DATA

	<u>PAGE</u>
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GASEOUS EMISSION SUMMARY

Location: Site E

Fuel: _____

TEST NO.	DATE	LOAD %	CONDITIONS	Boiler Outlet						Stack Outlet				SO ₂ ppm Dry	SO ₃ ppm Dry	NOTES
				O ₂ % Dry	CO ₂ % Dry	CO ppm Dry	NO ppm Dry	NO ₂ ppm Wet	HC ppm Wet	O ₂ % Dry	CO ₂ % Dry	CO ppm Dry	NO ppm Dry			
1	11/16/78	51	as found (same)	7.6	12.0	81	480			8.9	11.1	98	371			Load down for firing test
3	11/18/78	38	amb air only	8.8	11.1	100	392			9.9	9.8	103	311			
4	11/20/78	61	as found	7.2	12.5	38	421			7.6	12.2	53	398			
5	11/21/78	44	as found	9.9	9.7	83	477			9.5	10.3	95	477			Load varied
6	12/12/78	54	low OFA	9.0	11.7	62	456			8.1	12.7	54	466			
7	12/13/78	56	high up OFA	5.2	13.9	147	367			7.0	12.3	170	392			
8	12/15/78	51	high OFA	6.8	12.5	84 9	367			7.5	12.0		370			
9	12/16/78	47	as found	7.7	11.6		368			8.1	11.2		373			
10a	12/16/78	50.5	high up OFA	7.9	11.4		424									
b			Lower biased OFA	7.6	11.6		404									
c			high OFA	10.0	9.9		439									
d			upper biased OFA	8.2	11.1		423									
e			low OFA	8.3	11.3		435									
11	12/16/78	52	low OFA	6.5	12.9		357			6.7	12.7		335			Kentucky Ind. ↑
12	12/20/78	56	as found	5.9	12.9		393			6.5	12.7		409			Crushed ↓
13	12/20/78	40	as found	9.2	10.1		483			9.5	10.0		489			

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NOTE: All parts per million (ppm) figures are corrected to a 3% O₂ constant dilution factor

GASEOUS EMISSION SUMMARY

Location: Site E

Fuel: _____

TEST NO.	DATE	LOAD %	CONDITIONS	Boiler Outlet						Stack				SO ₂ ppm Dry	SO ₃ ppm Dry	NOTES
				O ₂ % Dry	CO ₂ % Dry	CO ppm Dry	NO ppm Dry	NO ₂ ppm Wet	HC ppm Wet	O ₂ % Dry	CO ₂ % Dry	CO ppm Dry	NO ppm Dry			
14	12/20/78	61	as found	3.9	14.5		454				5.8	13.7		498		Crushed
15	1/5/79	59	as found	5.9	13.5		385									E. Kentucky
16	1/8/79	56	as found	8.3	11.0		360									E. Kentucky
17	1/10/79	56	as found	6.2	13.4		389									Kentucky
18a	1/12/79	54	vary air (low)	8.4	11.2		358									↓
b			Med	9.0	10.6		421									
c			High	9.8	10.0		435									
d			Med	9.3	10.0		428									
20	1/18/79	56	as found	1.0	12.3		405									

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NOTE: All parts per million (ppm) figures are corrected to a 3% O₂ constant dilution factor

KVB

GASEOUS EMISSIONS DATA

TEST SITE FE
 TEST NO # 2
 DATE 11-16-75

FUEL Kent Coal Industrial Mine
 LOAD Max Load 60/cent Furnace
 CONDITIONS As Is

DATA TAKEN BY MP

Probe Position	PM Time	O ₂ % (drv)	CO ₂ % (dry)	CO - ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, FPM (WET)								REMARKS	
				unc	cor	unc	cor	NOx		NO		NO ₂		HC			
1-5	2:45	6.4	15	38	47	278	308										Paint Air
10	3:20	6.75	8	16		18											R14 1st fl
7	3:40	7.0	12.4	42	57	310	379										
9	3:25	6.9	12.4	44	56	280	358										Paint not working
8	3:45	8.8	11.0	78	115	278	411										
9	4:30	11.0	10.2	78	141	240	434										
1-3-4-5	4:55	8.5	11.4	67	100	300	433										1-6 BRL out
7-8	5:15	8.6	11.0	78	114	292	425										7-8 BRL out #2
10	5:30	10.4	7	17		20											
9	5:45	8.9	10.6	65	97	256	352										9 - Stack
2-5	6:00	7.9	11.6	70	96	290	377										10 - Paint Air
																	Load Change
																	to 15 lower

AVERAGES																
Paint Air	4:55	10.0	7.5		16.5		19									
Stack	5:45	7.0	12.0		21		43									
Stack	5:45	8.0	11.5		75		112									
Stack	5:45	8.9	11.0		98		391									

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NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE F
 TEST NO #41
 DATE 11-20-78

FUEL _____
 LOAD 110 lbs
 CONDITIONS 45 °F
 DATA TAKEN BY WT

Probe Position	Time	O ₂ % (dry)	CO ₂ % (dry)	CO ppm (dry)		NO ppm (dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS		
				unc	cor	unc	cor	NOx		NO		NO ₂		HC				
								unc	cor	unc	cor	unc	cor	unc	cor			
1-5	12:40	5.3	14.4	25	29	335	384											
7-8	12:50	5.5	14.3	30	33	345	401											
9	1:10	6.9	12.8	40	51	317	408											
1-5	1:20	16.3	.7	30		30												
1-5	1:30	7.6	12.2	25	34	285	384											↓ Recal
7-8	1:55	7.2	12.8	50	65	335	438											
9	2:25	8.2	11.6	38	50	275	388											
1-5	2:35	16.3	.7	25		25												
1	2:48	7.1	13.0	30	39	309	401											
3	2:55	7.4	12.4	30	40	315	430											
4	3:20	7.9	11.6	30	41	315	434											
5	3:45	7.6	12.0	40	54	345	464											
1-5	4:00	7.5	11.8	20	27	340	454											

AVERAGES

BLR ² #1	7.2	12.5		38		421												
BLR ² #2	5.2	13.0		50		420												
Sheet	7.6	12.2		53		378												
Paint bin	11.3	7.1		28		X												

25 Not corrected for 3% O₂ *

NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
 TEST NO #5
 DATE 11-21-78

FUEL Kent
 LOAD 80.165
 CONDITIONS As Is
 DATA TAKEN BY MJ

Probe Position	Time	O ₂ (dry)	CO ₂ (dry)	CO		NO		HOT LINE SAMPLES, PPM (WET)								REMARKS	
				ppm(dry)		ppm(dry)		NO _x		NO		NO ₂		HC			
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor		
1-5	12:55	10.6	9.2	38	66	270	469										
1-5	1:00	10.5	9.5	47	81	298	513										Calib
7-8	1:30	9.5	10.5	98	154	330	518										Load change
9	1:50	10.0	10.2	70	115	300	423										10K up the chain
10	2:15	15.3	.65	35	///	20	///										
1-5	2:30	10.1	9.0	55	91	280	464										
7-8	2:55	9.9	9.2	115	252	323	526										
9	3:15	8.9	10.4	50	75	335	500										
10	3:40	16.0	.6	35	///	15	///										Load change
1-5	3:50	8.5	11.2	65	94	320	462										

AVERAGES																
BL Port 1		9.9	9.7	///	83	///	477	///	///	///	///	///	///	///	///	///
BL Port 2		9.7	7.85	///	123	///	522	///	///	///	///	///	///	///	///	
Stack		9.5	10.3	///	95	///	497	///	///	///	///	///	///	///	///	
Plant Air		15.7	.63	///	35	///	.15	///	*	///	///	///	///	///	///	

Not corrected for 3% O₂ *

NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
 TEST NO #6
 DATE 12-12-78

FUEL Kent Industrial
 LOAD 77.4 t/hr
 CONDITIONS 20°C F A
 DATA TAKEN BY MJ

Probe Position	PM Time	O ₂ (dry)	CO ₂ (dry)	CO (dry)		NO (dry)		HOT LINE SAMPLES, FPM (WET)								REMARKS		
				unc	cor	unc	cor	NOx		NO		N ₂ O		HC				
								unc	cor	unc	cor	unc	cor	unc	cor			
1-5*	3:20	9.1	11.2	0	0	280	425											One probe out should be .1% lower than probes 7-8
7-8	3:30	7.3	13.3	50	66	325	428											
9	3:50	7.8	13.2	35	48	328	448											
10	4:10	14.5	.6	20	8													
1-5*	4:20	9.0	12.0	38	57	305	457											
7-8	4:35	7.0	14.2	38	49	370	476											
9	4:45	8.3	12.2	42	60	340	483											
10	4:55	14.8	.5	20	8													
1-5*	5:00	8.9	12.0	45	67	325	485											
7-8	5:15	8.6	12.2	60	87	360	524											
10	5:30	14.8	.65	20	18													

AVERAGES

BL Point 1	Avg	9	11.7	62	456												
BL Point 2	Avg	7.6	13.2	67	476												
Stack	Avg	8.7	12.7	54	406												
Point Air	Avg	14.7	.5	20	8												

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NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
 TEST NO #7
 DATE 12-13-78
 RH = 32%

FUEL Kentucky Ind M. ne
 LOAD 101.2 K lbs/hr
 CONDITIONS high upper of A
 DATA TAKEN BY MJ

Probe Position	PM Time	O ₂ (dry)	CO ₂ (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS		
				unc	cor	unc	cor	NOx		NO		NO ₂		HC				
								unc	cor	unc	cor	unc	cor	unc	cor			
1-5	2:30	6.1	13.0	150	181	330	399											
7-8	2:50	6.0	13.0	122	147	335	402											
* 9	3:10	7.7	11.6	140	190	318	431											
10	3:30	19.5	.8	110	///	8	///											
1-5	3:40	4.9	14.2	122	136	330	369											
1-5	3:55	4.9	14.2	122	136	///	///	45	50	35	39	-10	-11					man. full. this tool needs constant in atmosphere of NO DS NOT span in-house Recalibrated NO used 0-100 scale
								23	26	25	28	-2	-22					
								23	26	24	27	-1	-1.1					
								21	24	24	27	-3	-3.4					
								38	43	41	46	-3	-3.4					
								40	45	40	45	0	0					
								36	40	37	41	-1	-1.1					
								37	41	37	41	0	0					
7-8	4:30	6.5	12.8	122	152	310	385											
9	4:45	6.2	13.0	122	149	290	353											
10	4:55	19.8	.6	100	///	0	///											
1-5	5:10	4.8	14.2	122	136	300	333											
7-8	5:20	6.3	12.8	122	150	312	382											
10	5:35	19.5	1.0	100	///	2	///											

AVERAGES

BIRout 1	AVG.	5.2	13.9	///	147	///	367	///	36.9	///	36.7	///	-2	///				NO _x from Port 2
BIRout 2	AVG.	6.3	12.9	///	150	///	390	///										
Stack	AVG.	6.45	12.3	///	170	///	392	///										
* Point Air	AVG.	19.5	.8	///	123	///	3	///										Not corrected for 3%

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NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
 TEST NO #8
 DATE 12-15-78
 RH = 35%

FUEL Kentucky Incl Mine
 LOAD 912 kwh/hr
 CONDITIONS 2.9" dia - high of 4
 DATA TAKEN BY BC

Probe Position	Time	O ₂ (dry)	CO ₂ (dry)	CO		NO		HOT LINE SAMPLES, PPM (WET)								REMARKS		
				ppm(dry)		ppm(dry)		NOx		NO		NO ₂		HC				
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor			
1-5	1:35	7.8	11.7	*		270	359											*CO Broken
7-8	1:50	7.4	12.2			280	371											
10	2:10	20.0	.8			5												
1	2:20	7.3	12.5			290	382											
2	2:30	7.0	12.5			290	375											
3	2:40	6.0	13.0			300	360											
4	2:50	7.0	12.2			290	375											
5	3:05	6.4	13.0			300	370											
9	3:20	7.5	12.0			280	370											
7-8	3:40	7.4	11.4			280	371											
1-5	3:55	5.8	13.2			300	356											
1-5	4:15	6.8	12.0			280	355	125	158.7	122	154.9	-3	-3.8					
								130	160.0	123	156.2	-1	-8.9					
								120	152.3	120	152.3	0	0					
10	4:30	20.5	.5			0												

AVERAGES																		
8-9	11	AVG	6.5	12.5				3.7		158.7		154.5		-4.2				
8-9	12	AVG	7.4	11.8				3.7										
3	1	AVG	7.5	12.0				3.7										
3	1	AVG	2.0	7.5				2.5										

NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
 TEST NO #10
 DATE 12-17-78

FUEL Kentucky Int. #1 oil
 LOAD _____
 CONDITIONS Change of A
 DATA TAKEN BY AK

Probe Position	Time	O ₂ % (dry)	CO ₂ % (dry)	CO - ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS		
				unc	cor	unc	cor	NOx		NO		NO ₂		HC				
								unc	cor	unc	cor	unc	cor	unc	cor			
1-5	12:00	7.9	11.2			320	441											upper low
1-5		7.5	11.6			305	407	156	205	160	214	-40	-50					lower norm
AVG →		7.7	11.4				424											
1-5	2:00	7.6	11.6			300	404											upper low
1-5	2:10	10.0	9.9			265	435	975	160.1	975	160.1	0						upper low
1-5	2:20	10.0	9.9			270	445											upper low
AVG →		10.0	9.9				437											
1-5	2:30	8.3	11.0			300	420	106.3	151	106.3	151	0						upper H:
1-5	2:55	8.1	11.2			300	417											lower lower
AVG →		8.2	11.1				423											
1-5	3:05	8.3	11.1			310	440											
1-5	3:10	8.2	11.4			305	430	115.0	162	115.0	162	0						upper low
AVG →		8.25	11.25				435											lower low

AVERAGES

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

NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE F FUEL _____
 TEST NO 411 LOAD 52%
 DATE 12-18-78 CONDITIONS _____
 DATA TAKEN BY BC

Probe Position	Time	O ₂ % (dry)	CO ₂ % (dry)	CO - ppm(dry)		NO - ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS		
				unc	cor	unc	cor	NOx		NO		NO ₂		HC				
								unc	cor	unc	cor	unc	cor	unc	cor			
10	11:45	19.8	7.5	N.A.		0												Paint Fumes
1-5	1:55	7.8	11.6			2.8	383											
7,8	2:10	7.4	12.2			2.9	385											
10	2:40	2.0	6.8			0.05												
1	2:50	6.1	13.2			3.1	372											
2	3:00	5.4	13.8			3.2	376											
3	3:10	5.7	13.2			3.0	353											
5	3:30	5.7	13.6			2.8	330											
7	3:40	6.4	13.0			2.6	321											
4	3:50	8.3	11.2			2.5	355											
1-5	4:10	6.5	13.8			2.1	336											
7,8	4:25	6.0	13			2.9	341											
9	4:40	7.0	12.4			2.7	345											
10	4:55	7.8																

AVERAGES

Probe Pos	Avg	O ₂	CO ₂	CO	NO	NOx	NO	NO ₂	HC
1-5	11.6	7.8	13.2	3.1	372	2.8	330	2.6	321
7,8	12.2	7.4	13.2	3.0	353	2.9	341	2.7	345
9	12.4	7.0	12.4	2.7	345				
10	7.5	19.8							

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NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE 1
 TEST NO 215
 DATE 11-10-78

FUEL Gas
 LOAD 72
 CONDITIONS Normal
 DATA TAKEN BY MT

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm (dry)		NO ppm (dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS		
				unc	cor	unc	cor	NOx		NO		NO2		HC				
								unc	cor	unc	cor	unc	cor	unc	cor			
1-5	2:26	9.4	9.7			280	420											
7-8	2:35	8.7	8.4			310	455											
10	2:42	20.0	16			5												
1-5	3:00	7.1	10.2			320	445	113.9	172.4	104.5	170.2							-1.4
1-5	3:30	9.0	10.4			315	474											
7-8	3:35	8.9	8.2			320	477											
9	3:50	10.5	9.0			30	53-1											
10	4:10	14.8	10			10												
1	4:15	10.0	9.2			320	420											
2	4:25	10.0	9.7			340	550											
3	4:35	10.2	9.0			290	435											
4	4:45	9.7	9.2			295	420											
5	4:55	8.5	10.0			350	450											
7-8	5:10	8.0	8.2			300	450											
7-8	5:20	7.4	10.0			300	470											
9	5:35	8.0	10.0			300	460											
10	5:50	10.0	7			5												
1-5	6:00	7.2	10.0			350	457											

AVERAGES																		
Probe 1	Avg	9.2	10.1															
Probe 2	Avg	8.3	10.9															
Probe 5	Avg	7.45	6.0															
Rem Air	Avg	14.8	10															

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NOTE: Parts per million (ppm) figures are corrected to 3% O2

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
 TEST NO. 14
 DATE 12-20-78

FUEL Crushed
 LOAD 110 lbs/hr
 CONDITIONS Normal
 DATA TAKEN BY JOB

Probe Position	Time	O ₂ % (dry)	CO ₂ % (dry)	CO		NO		HOT LINE SAMPLES, PPM(WET)								Remarks	
				ppm(dry)		ppm(dry)		NOx		NO		NO ₂		HC			
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor		
1-5	8:30	3.7	14.8			400	416										
7-8	8:56	3.5	15.4			460	473										
9	9:10	5.8	13.7			410	498										
10	9:50	18.4	0.8			8	-										
1-5	10:12	3.9	14.4			460	454										
7-8	10:35	3.2	15.2			470	475										
10	10:50	19.0	0.7			11	-										
1-5	11:15	4.0	14.2			437	463										
<div style="position: absolute; top: -50px; left: 50%; transform: translate(-50%, -50%); font-size: 2em; opacity: 0.5;">X</div>																	
BLR 1	AVG.	3.9	14.5				454										
BLR 2	AVG.	3.4	15.3				474										
Stack	AVG.	5.8	13.7				498										
Paint Air	AVG.	18.7	0.7				10										

NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE F
 TEST NO. 15
 DATE Jan 5 79

FUEL _____
 LOAD _____
 CONDITIONS _____
 DATA TAKEN BY MF

Probe Position	Am Time	O ₂ % (dry)	CO ₂ % (dry)	CO		NO		HOT LINE SAMPLES, PPM(WET)								Remarks		
				ppm(dry)		ppm(dry)		NOx		NO		NO ₂		HC				
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor			
1-5	10 ⁰⁰	4.8	14.5			330	367											
7+8	10 ¹⁵	4.8	14.5			340	378											
10	10 ²⁰	20.3	.4			8												
1-5	11 ¹⁰	6.6	13.0			320	401											
7+8	11 ²⁵	5.5	13.0			340	395											
9	11 ⁴⁰																Plugged up	
1-5	11 ⁵⁰	6.4	13.0			310	383											
1-5	12 ⁰⁰	6.0	13.6					70	84.1	70	84.1	0	-				Nox Cal	
								72.5	87.1	72.5	87.1	0	-				Not Same As NO	
								75	90.1	75	90.1	0	-				only difference	
								75	90.1	75	90.1	0	-				Accurate	
1-5	12 ¹⁰	6.5	12.8			320	398										Nox from	
10	12 ¹⁵	20.5	.4			12											Port 3	
7+8	12 ²⁰	4.8	14.5			350	389											
1-5	12 ⁴⁵	5.6	13.9			330	386											
Stack																		Line from ^{not} walk
Blr out 1	AVG.	5.9	13.5															
Blr out 2	AVG.	5.0	14.3															
Part Av	AVG.	20.4	.4															

NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
 TEST NO. 16
 DATE 1-8-79

FUEL East Kent
 LOAD 100 K lbs
 CONDITIONS as found (normal)
 DATA TAKEN BY JLB

Probe Position	Time	O ₂ % (dry)	CO ₂ % (dry)	CO ppm (dry)		NO ppm (dry)		HOT LINE SAMPLES, PPM (WET)								Remarks		
				unc	cor	unc	cor	NOx		NO		NO ₂		HC				
								unc	cor	unc	cor	unc	cor	unc	cor			
2-6	10:30	7.5	11.6	005		235	314											Pretest 1-50L 5-5000 paint filter down Probe #4 was out of the boiler during the test and #5 was in
2,3,4,6	12:30	8.0	11.2	005		270	375											
10	12:50	19.5	0.6	005		5												
7,8	13:10	4.3	14.8	005		360	385											
7,8	13:35	5.2	13.7	005		360	410											
2,3,4,6	14:06	8.2	11.2	005		360	422											
10	14:25	19.8	0.6	005		0												
7,8	15:35	5.3	13.4	005		330	379											
3,4,6	17:00	9.5	10.0	005		210	330											
Corrected BLR OUT #1		4.1	14.7			338	360											
PAINT AIR AVG.		19.7	0.6	005		3												
BLR OUT #1 AVG.		8.3	11.0		005		360											
OUT #2 AVG.		4.9	14.0		005		392											
STACK AVG.		iced up																

NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
 TEST NO #17
 DATE 1-10-71

FUEL Residual, Ind. Motor
 LOAD 100%
 CONDITIONS Normal
 DATA TAKEN BY JCS

Probe Position	Time	O ₂ (dry)	CO ₂ (dry)	CO		NO		HOT LINE SAMPLES, PPM (WET)								REMARKS			
				ppm(dry)		ppm(dry)		NOx		NO		NO ₂		HC					
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor				
2,3,4,6	10:17	4.5	12.5			210	330												
6	11:05	5.4	14.9			335	387												Probe #4/5 out
7,8	11:45	6.2	13.6			325	392												See 10:17
2,3,5,6	12:15	5.9	12.7			325	415												
10	12:45	5.5	8.5			11													
2,3,5,6	13:30	5.9	13.6			325	364												
7	14:00	4.8	14.1			330	307												
6	14:30	3.5	14.7			300	312												300 part
3,5,6	15:00	5.7	13.9			320	389												
10	15:20	4.5	8.7			12													
6	15:30	5.5	13.7			350	402												See

AVERAGES																			
10:17	4.5	6.2	13.6		2.5		330												
11:05	5.4	5.9	14.3		3.5		360												
12:15	5.9	5.9	13.7		2.5		377												
15:30	5.5	5.5	13.7		2.5		402												

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NOTE: Parts per million (ppm) figures are corrected to 3% O₂

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
 TEST NO. 20
 DATE 1-18-79

FUEL Kist
 LOAD 100
 CONDITIONS normal
 DATA TAKEN BY My

RH = 40%

Probe Position	Time	O ₂ % (dry)	CO ₂ % (dry)	CO		NO		HOT LINE SAMPLES, PPM(WET)								Remarks	
				ppm(dry)		ppm(dry)		NOx		NO		NO ₂		HC			
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor		
2-6	2 ³⁰	5.9	13.2			310	370										
6	2 ⁴⁰	2.4	15.9			390	377										
5	3 ⁰⁰	6.4	13.0			330	407										
4	3 ³⁰	10.0	9.8			250	411										
3	3 ⁴⁵	7.6	11.7			290	390										
2	4 ⁰⁰	9.0	11.0			300	451										
2-6	4 ³⁰	6.8	12.4			340	432										
2-6	5 ⁰⁰	8.0	11.2			290	402										
BLR OUT	AVG.	7.0	12.3		DO5		405										
	AVG.																
	AVG.																

NOTE: Parts per million (ppm) figures are corrected to 3% O₂

Local S:6 E

SOx DATA SHEET

Date 1-8-79 Probe Location & Probe Length 2'

Unit # 2 Fuel _____ Load _____

Test Description: _____

Test No.	Box No.	Sample Time	Meter Temp. (T)	Meter (P) Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
16-1	1	12:48	115	-0-	0.000	29.28	2	40 min.	8.0
			120		1.001				
16-2	2	13:00	120		0.000			30 min.	8.0
			122		1.000				
16-3	Method #6	14:00	80		0.000			30 min.	8.0
			84		1.000				

SAMPLED BY MJ

Test # 16-1

Test # 16-2

Test # 16-3 Method #6

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0100						.0100		
Dilution Factor F	25	1		25	1		5	5	
Blank B									
Averages									
Ml. of Titrant A	7.8 7.7 7.8	.9		7.6 7.6 7.6	.8		25 25 25	.4 1.4 —	
Averages	7.8	.9		7.6	.8		25	—	
460 + T	577.5	577.5		581	581		542		
Sample Vol. v	1.001	1.001		1.000			1.000		
P + p	29.28								
A - B	7.8	.9		7.6	.8				

suspected Gross Leak

TITRATED BY MJ

$$SO_2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO_2 = \frac{(7.8)(.0100)(25)(577.5)}{(1.001)(29.28)}$$

$$SO_2 = \boxed{922.1} \quad SO_3 = \boxed{4.6}$$

$$SO_3 = \frac{(9)(.0100)(1)(577.5)}{(1.001)(29.28)}$$

$$SO_2 @ 3\% O_2 = \frac{1279.5}{100} = 12.795$$

$$SO_3 @ 3\% O_2 = \frac{6.3}{100} = 0.063$$

$$SO_x @ 3\% O_2 = \frac{1285.8}{100} = 12.858$$

$$SO_2 = \frac{(7.6)(.0100)(25)(581)}{(1.000)(29.28)}$$

$$SO_2 = \boxed{905}$$

$$SO_3 = \frac{(8)(.01)(1)(581)}{(1)(29.28)}$$

$$SO_3 = \boxed{3.8}$$

$$SO_2 @ 3\% O_2 = \frac{1255.7}{100} = 12.557$$

$$SO_3 @ 3\% O_2 = \frac{5.7}{100} = 0.057$$

$$SO_x @ 3\% O_2 = \frac{1261}{100} = 12.61$$

$$SO_2 = \frac{(25)(.01)(5)(542)(24)}{(1.0)(29.28)}$$

$$SO_2 = \boxed{555.3}$$

$$SO_3 = \frac{(4)(.01)(5)(543)(24)}{(1.0)(29.28)}$$

$$SO_3 = \boxed{8.9}$$

$$SO_2 @ 3\% O_2 = \frac{771}{100} = 7.71$$

$$SO_3 @ 3\% O_2 = \frac{12}{100} = 0.12$$

$$SO_x @ 3\% O_2 = \frac{783}{100} = 7.83$$

Local Sike

SOx DATA SHEET

Date 1-10-79 Probe Location & Probe Length 2'

Unit # 2 Fuel _____ Load _____

Test Description: _____

Test No.	Box No.	Sample Time	Meter Temp. (T)	Meter (P) Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
17A	MEMO #6	13:00	118	-0-	0.000	29.60	2	40 min	5.4
			118		1.000				
17B	1	13:50	118		0.000			45 min	4.7
			120		1.000				
17C	2	12:30	115		0.000			60 min	3.8
			115		1.000				

SAMPLED BY MJ

MEMO #6
 Test # 17A Test # 17B Test # 17C

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0100	→	→	.0100	→	→	→	→	→
Dilution Factor F	5			25	1		25	1	
Blank B									
Averages									
Ml. of Titrant A	25.1 25.3 25.3	.1		5.65 5.7 5.7	.8		6.5 — —	.9 — —	
Averages	25.2	.1		5.7	.8		6.5	.9	
460 + T	578	578		57	57		575	575	
Sample Vol. V	1.000	→	→	→	→	→	→	→	→
P + p	29.60	→	→	→	→	→	→	→	→
A - B	25.2	.1		5.7	.8		6.5	.9	

TITRATED BY MJ

$$SO_2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO_2 = \frac{(25.3 - .01)(.01)(5)(578)(24)}{(1.0)(29.6)}$$

$$SO_2 = \boxed{59.5} \quad SO_3 = \boxed{2.3}$$

$$SO_3 = \frac{(.1)(.01)(5)(578)(24)}{(1.0)(29.6)}$$

$$SO_2 @ 3\% O_2 = \underline{682}$$

$$SO_3 @ 3\% O_2 = \underline{2.7}$$

$$SO_x @ 3\% O_2 = \underline{685}$$

$$SO_2 = \frac{(5.7 - .01)(.01)(25)(579)(24)}{(1)(29.6)}$$

$$SO_2 = \boxed{668}$$

$$SO_3 = \frac{(.8)(.01)(1)(579)(24)}{(1)(29.6)}$$

$$SO_3 = \boxed{3.7}$$

$$SO_2 @ 3\% O_2 = \underline{738.0}$$

$$SO_3 @ 3\% O_2 = \underline{4.0}$$

$$SO_x @ 3\% O_2 = \underline{742.0}$$

$$SO_2 = \frac{(6.5 - .01)(.01)(25)(575)(24)}{(1)(29.6)}$$

$$SO_2 = \boxed{758}$$

$$SO_3 = \frac{(.9)(.01)(1)(575)(24)}{(1)(29.6)}$$

$$SO_3 = \boxed{4.0}$$

$$SO_2 @ 3\% O_2 = \underline{793}$$

$$SO_3 @ 3\% O_2 = \underline{4.2}$$

$$SO_x @ 3\% O_2 = \underline{797.2}$$

SOx DATA SHEET

Date 1-10-79 Probe Location & Probe Length _____

Unit # 2 Fuel _____ Load _____

Test Description: _____

Test No.	Box No.	Sample Time	Meter Temp. (T)	Meter (P) Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
17-4	METHOD #6	13:50	112	-0-	0.000	29.60	2	35	5.3
			—	-0-	1.000				

SAMPLED BY MJ

Test # 17-4 METHOD #6 Test # _____ Test # _____

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.010	→							
Dilution Factor F	5								
Blank B									
Averages									
Ml. of Titrant A	30.0 30.3 30.2	.2							
Averages	30.2								
460 + T	572	572							
Sample Vol. V	1.000	1.000							
P + p	29.60								
A - B	30.2	.2							

TITRATED BY MJ

$$SO_2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO_2 = \frac{(30.2)(.01)(5)(572)24}{(1.0)(29.6)}$$

$$SO_2 = \boxed{700} \quad SO_3 = \boxed{46}$$

$$SO_3 = \frac{(.2)(.01)(5)(572)24}{(1.0)(29.6)}$$

$$SO_2 @ 3\% O_2 = \underline{803}$$

$$SO_3 @ 3\% O_2 = \underline{5.3}$$

$$SO_x @ 3\% O_2 = \underline{808}$$

$$SO_2 = \frac{(\quad)(\quad)(\quad)(\quad)24}{(\quad)(\quad)}$$

$$SO_2 = \boxed{\quad}$$

$$SO_3 = \frac{(\quad)(\quad)(\quad)(\quad)24}{(\quad)(\quad)}$$

$$SO_3 = \boxed{\quad}$$

$$SO_2 @ 3\% O_2 = \underline{\quad}$$

$$SO_3 @ 3\% O_2 = \underline{\quad}$$

$$SO_x @ 3\% O_2 = \underline{\quad}$$

$$SO_2 = \frac{(\quad)(\quad)(\quad)(\quad)24}{(\quad)(\quad)}$$

$$SO_2 = \boxed{\quad}$$

$$SO_3 = \frac{(\quad)(\quad)(\quad)(\quad)24}{(\quad)(\quad)}$$

$$SO_3 = \boxed{\quad}$$

$$SO_2 @ 3\% O_2 = \underline{\quad}$$

$$SO_3 @ 3\% O_2 = \underline{\quad}$$

$$SO_x @ 3\% O_2 = \underline{\quad}$$

SECTION 4,0
PARTICULATE SIZE DISTRIBUTION

	<u>PAGE</u>
4.1 BRINK	153
4.2 SASS	159

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. <u>11</u>	LOAD <u>93,400 lbs/hr</u>
TEST SITE <u>E</u>	% O ₂ <u>7.90</u>
TEST DATE <u>12/18/48</u>	FUEL <u>Kentucky (Industrial)</u>
SAMPLE LOCATION <u>Econ. Out</u>	SPECIAL CONDITIONS <u>Low O.F.A.</u>

ρ _p - Density of particles <u>2.5</u> g/cm ³	V _m - Dry gas volume <u>2.005</u> SCF
μ - Viscosity of flue gas <u>2.6 × 10⁻⁴</u> poise	M _n - Total particulate mass <u>68.5</u> mgm
M _w - Molecular wt. flue gas <u>29.4</u> g/g mole	C _n - Total concentration _____ grains/SCF
ΔP _I - Pressure drop across impactor <u>15.5</u> in H ₂ O	I - Percent isokinetics <u>90.2</u> %
P _s - Absolute stack pressure <u>28.92</u> in. Hg	V _s - Gas velocity <u>14.97</u> ft/sec.
T _s - Absolute stack temperature <u>960</u> °R	D _n - Nozzle diameter <u>0.119</u> in.
Q _s - Actual flow rate at stack conditions <u>.057</u> ft ³ /min	

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
D _j - Jet Diameter, cm		0.2490	0.1775	0.1396	0.0946	0.0731	
F _j - Press. factor, n.d.		0.0210	0.0273	0.0395	0.0903	0.3277	
D _{s,50} Stokes diameter, μm		3.29	1.90	1.27	0.62	0.36	
D _{A,50} Aerodynamic diameter, μm		5.32	3.12	2.12	1.09	0.68	
D _{AI,50} Aerodynamic impaction diameter, μm		5.53	3.33	2.32	1.29	0.87	
M _n - Particulate mass, mgm	53.8	7.0	2.6	1.9	2.2	0.2	0.8
% - Percent of Total	79.7	10.2	4.0	2.8	3.2	0.4	1.2
Cumulative percent	21.8	11.6	7.6	4.8	1.6	1.2	
C _n - Concentration, grains/SCF	0.414	0.054	0.020	0.015	0.017	0.002	0.006
Cumulative concentration, grains/SCF	0.414	0.468	0.488	0.503	0.520	0.522	0.528

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 11 LOAD 52% 93,400 lbs/hr
 TEST SITE E % O₂ 7%
 TEST DATE 12/18/78 FUEL Kentucky (Industrial)
 SAMPLE LOCATION Econ. Out SPECIAL CONDITIONS Low O.F.A.

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP 0.04 BAROMETRIC PRESS in. Hg, P_{bar} 29.22
 GAS TEMP. °R, T_s 960 GAS STATIC PRESS in. H₂O -4.1
 PITOT CORRECTION FACTOR, C_p _____ GAS STATIC PRESS in. Hg abs, P_s 28.92
 MOLECULAR WT. FLUE GAS, M_w 29.4

$$V_s = 85.48 C_p \left(\frac{T_s \Delta P}{P_s M_w} \right)^{1/2} = \underline{14.97} \text{ ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, D_n 0.119
 NOZZLE AREA ft², A_n 7.72 x 10⁻⁵ A_n = π(D_n/24)²
 Q_n = V_s A_n 60 = 0.069 ft³/min at nozzle
 Q_c = Q_s $\left(\frac{P_s M_w}{1.3 T_s} \right)^{1/2}$ = 0.0569 ft³/min corrected to calibration conditions
 PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 15.5 in. H₂O
 OPERATING VACUUM (corrected for static pressure of duct) 19.6 in. H₂O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (V _m)	METER TEMP (T _m)
INITIAL	2.40 p.m.	0.000	94
FINAL	3.39.5 sec	2.005	92
Δ	59.9	2.005	93

$$\%H_2O = \underline{6.5} \%$$

$$I = \frac{1.667 T_s V_m P_{bar}}{\theta T_m V_s P_s A_n (1 - \frac{\%H_2O}{100})} = \underline{90.2} \%$$

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. 11 LOCATION S. K. E
 TEST DATE 12-19-78 ENGINEER _____
 TEST DESCRIPTION _____

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.		<u>12-20-78</u>	<u>12-18-78</u>	—	—	—	—	→
TARE WT.	1	<u>.3979</u>	<u>3.5117</u>	<u>3.0939</u>	<u>3.9825</u>	<u>3.7817</u>	<u>3.9024</u>	<u>.0466</u>
	2	—	<u>3.5116</u>	<u>3.0940</u>	<u>3.9825</u>	<u>3.7818</u>	<u>3.9025</u>	<u>.0467</u>
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
AVERAGE		<u>.3979</u>	<u>3.5117</u>	<u>3.0940</u>	<u>3.9825</u>	<u>3.7818</u>	<u>3.9025</u>	<u>.0467</u>

POST TEST WEIGHTS (GRAMS)

DATE WT.		<u>12-20-78</u>	—	—	—	—	—	—
GROSS WT.	1	<u>.4517</u>	<u>3.5187</u>	<u>3.0965</u>	<u>3.9844</u>	<u>3.7840</u>	<u>3.9027</u>	<u>.0475</u>
	2	—	<u>3.5186</u>	<u>3.0966</u>	<u>3.9844</u>	<u>3.7838</u>	<u>3.9027</u>	<u>.0475</u>
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
AVERAGE		<u>.4517</u>	<u>3.5187</u>	<u>3.0966</u>	<u>3.9844</u>	<u>3.7840</u>	<u>3.9027</u>	<u>.0475</u>

NET TEST RESULTS (MILLIGRAMS)

NET WT.	<u>.0538 g</u>	<u>.0070 g</u>	<u>.0026 g</u>	<u>.0019 g</u>	<u>.0022 g</u>	<u>.0002 g</u>	<u>.0008 g</u>
PERCENT	<u>79.1</u>	<u>10.2</u>	<u>4.0</u>	<u>2.8</u>	<u>3.2</u>	<u>0.4</u>	<u>1.2</u>

TOTAL NET WEIGHT 68.50 mgm

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. <u>14</u>	LOAD <u>110 Klbs/hr</u>
TEST SITE <u>E</u>	% O ₂ <u>3.9%</u>
TEST DATE <u>12/21/78</u>	FUEL <u>Crushed</u>
SAMPLE LOCATION <u>Econ. Out</u>	SPECIAL CONDITIONS <u>normal</u>

ρ _p - Density of particles <u>2.5</u> g/cm ³	V _m - Dry gas volume <u>2.00</u> SCF
μ - Viscosity of flue gas <u>2.63</u> × 10 ⁻⁴ poise	M _n - Total particulate mass <u>216.6</u> mgm
M _W - Molecular wt. flue gas <u>29.4</u> g/g mole	C _n - Total concentration <u>1.67</u> grains/SCF
ΔP _I - Pressure drop across impactor <u>7.5</u> in H ₂ O	I - Percent isokinetics <u>101</u> %
P _s - Absolute stack pressure <u>28.07</u> in. Hg	V _s - Gas velocity <u>24.402</u> ft/sec.
T _s - Absolute stack temperature <u>960</u> °R	D _n - Nozzle diameter <u>0.077</u> in.
Q _s - Actual flow rate at stack conditions <u>0.039</u> ft ³ /min	

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
D _j - Jet Diameter, cm		0.2490	0.1775	0.1396	0.0946	0.0731	
F _j - Press. factor, n.d.		0.0210	0.0273	0.0395	0.0903	0.3277	
D _{S,50} Stokes diameter, μm		4.04	2.35	1.58	0.79	0.47	
D _{A,50} Aerodynamic diameter, μm		6.51	3.83	2.61	1.37	0.86	
D _{AI,50} Aerodynamic impaction diameter, μm		6.72	4.05	2.82	1.57	1.07	
M _n - Particulate mass, mgm	198.8	5.0	5.7	2.4	0.6	0.7	3.4
% - Percent of Total	92.9	2.3	2.6	1.1	0.3	0.3	1.6
Cumulative percent	8.2	5.9	3.3	2.2	1.9	1.6	
C _n - Concentration, grains/SCF	1.53	0.04	0.04	0.02	0.00	0.01	0.03
Cumulative concentration, grains/SCF	1.53	1.57	1.61	1.63	1.63	1.64	1.66

#15900

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 14 LOAD 110 Klbs/hr
 TEST SITE E % O₂ 3.9%
 TEST DATE 12/21/78 FUEL Crushed
 SAMPLE LOCATION Eccn. Out SPECIAL CONDITIONS normal

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP 0.1 BAROMETRIC PRESS in. Hg, P_{bar} 28.38
 GAS TEMP. °R, T_s 960 GAS STATIC PRESS in. H₂O -4.2
 PITOT CORRECTION FACTOR, C_p 0.837 GAS STATIC PRESS in. Hg abs, P_s 28.07
 MOLECULAR WT. FLUE GAS, M_w 29.4

$$V_s = 85.48 C_p \left(\frac{T_s \Delta P}{P_s M_w} \right)^{1/2} = \underline{24.402} \text{ ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, D_n 0.077
 NOZZLE AREA ft², A_n 3.234 x 10⁻⁵ A_n = π(D_n/24)²
 Q_n = V_s A_n 60 = 0.0473 ft³/min at nozzle
 Q_c = Q_s $\left(\frac{P_s M_w}{1.3 T_s} \right)^{1/2}$ = 0.0384 ft³/min corrected to calibration conditions
 PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 7.5 in. H₂O
 OPERATING VACUUM (corrected for static pressure of duct) 11.7 in. H₂O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (V _m)	METER TEMP (T _m)
INITIAL	10:00	0.00	163
FINAL	11:17	2.00	104
Δ	77.	2.00	100

$$\% \text{H}_2\text{O} = \underline{6.5} \%$$

$$I = \frac{1.667 T_s V_m P_{bar}}{\theta T_m V_s P_s A_n \left(1 - \frac{\% \text{H}_2\text{O}}{100}\right)} = \underline{100.98} \%$$

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. 14 LOCATION Side E
 TEST DATE 12-21-78 ENGINEER _____
 TEST DESCRIPTION _____

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.		<u>12-20-78</u>	—	—	—	—	—	—
TARE WT.	1	<u>.3911</u>	<u>3.5116</u>	<u>3.0934</u>	<u>3.9823</u>	<u>3.7813</u>	<u>3.9017</u>	<u>.0372</u>
	2	—	<u>3.5116</u>	<u>3.0934</u>	<u>3.9822</u>	<u>3.7813</u>	<u>3.9017</u>	<u>.0372</u>
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
AVERAGE		<u>.3911</u>	<u>3.5116</u>	<u>3.0934</u>	<u>3.9822</u>	<u>3.7813</u>	<u>3.9017</u>	<u>.0372</u>

POST TEST WEIGHTS (GRAMS)

DATE WT.					<u>3</u>			
GROSS WT.	1	<u>.5899</u>	<u>3.5166</u>	<u>3.0993</u>	<u>3.9847</u>	<u>3.7820</u>	<u>3.9024</u>	<u>.0406</u>
	2	—	<u>3.5167</u>	<u>3.0990</u>	<u>3.9846</u>	<u>3.7819</u>	<u>3.9024</u>	<u>.0407</u>
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
AVERAGE		<u>.5899</u>	<u>3.5166</u>	<u>3.0991</u>	<u>3.9846</u>	<u>3.7819</u>	<u>3.9024</u>	<u>.0406</u>

NET TEST RESULTS (grams)

NET WT.	<u>0.1988</u>	<u>.0050</u>	<u>.0057</u>	<u>.0024</u>	<u>.0086</u>	<u>.0007</u>	<u>.0034</u>
PERCENT	<u>92.9</u>	<u>2.3</u>	<u>2.6</u>	<u>1.1</u>	<u>0.2-8</u>	<u>0.3</u>	<u>1.6</u>

TOTAL NET WEIGHT 216.6 mgm

SITE E
SASS GRAVIMETRICS

Test 16	10 μ	45.4120	26.75% Passing
	3 μ	9.9770	10.66% Passing
	1 μ	5.5753	1.67% Passing
	Filter	<u>1.0323</u>	
	Total	61.9966	

Test 17	10 μ	38.6439	23.33% Passing
	3 μ	7.1962	9.05% Passing
	1 μ	3.8166	1.48% Passing
	Filter	<u>0.7436</u>	
	Total	50.4003	

KVB 15900-531

SECTION 5.0
FUEL AND ASH ANALYSIS

	<u>PAGE</u>
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5.3 COAL SIEVE ANALYSES	225

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COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

March 7, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us Kentucky Coal

Test #2
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled -----

Date received 2/23/79

Analysis report no. 71- 28210

PROXIMATE ANALYSIS

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	4.63	xxxxx
% Ash	5.89	6.18
% Volatile	36.78	38.56
% Fixed Carbon	52.70	55.26
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	13651	14314
% Sulfur	0.86	0.90

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	4.63	xxxxx
% Carbon	74.94	78.58
% Hydrogen	4.99	5.23
% Nitrogen	1.51	1.58
% Chlorine	0.20	0.21
% Sulfur	0.86	0.90
% Ash	5.89	6.18
% Oxygen(diff)	6.98	7.32
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. House
R. A. HOUSE, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 6, 1979

Sample Identification
by KVB, Inc.

Kind of sample reported to us Coal Test #3
Sample taken at -----
Sample taken by KVB, Inc.
Date sampled 11/18/78
Date received 2/23/79

Analysis report no. 71- 28214

PROXIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	6.52	xxxxx
% Ash	8.68	9.29
% Volatile	34.51	36.92
% Fixed Carbon	50.29	53.79
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	12546	13421
% Sulfur	0.96	1.03

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	6.52	xxxxx
% Carbon	70.87	75.81
% Hydrogen	4.75	5.08
% Nitrogen	1.29	1.38
% Chlorine	0.17	0.18
% Sulfur	0.96	1.03
% Ash	8.68	9.29
% Oxygen(diff)	6.76	7.23
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
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R. A. Houser

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us Kentucky Coal

Test #4
Test Site: E

Sample taken at ----

Sample taken by KVB, Inc.

Date sampled ----

Date received 2/23/79

Analysis report no. 71- 28218

PROXIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	5.77	xxxxx
% Ash	6.71	7.12
% Volatile	35.44	37.61
% Fixed Carbon	52.08	55.27
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	12942	13734
% Sulfur	0.74	0.79

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	5.77	xxxxx
% Carbon	72.97	77.44
% Hydrogen	4.89	5.19
% Nitrogen	1.47	1.56
% Chlorine	0.09	0.10
% Sulfur	0.74	0.79
% Ash	6.71	7.12
% Oxygen(diff)	7.36	7.80
	<u>100.00</u>	<u>100.00</u>

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R. A. Houser

R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

► KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us Kentucky Coal

Test No. 5
Test Site: E

Sample taken at ----

Sample taken by KVB, Inc.

Date sampled 11/21/78

Date received 2/23/79

Analysis report no. 71- 28222

PROXIMATE ANALYSIS

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	8.13	xxxxx
% Ash	10.24	11.15
% Volatile	33.03	35.95
% Fixed Carbon	48.60	52.90
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	12021	13085
% Sulfur	0.85	0.93

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	8.13	xxxxx
% Carbon	67.74	73.74
% Hydrogen	4.59	5.00
% Nitrogen	1.31	1.43
% Chlorine	0.14	0.15
% Sulfur	0.85	0.93
% Ash	10.24	11.15
% Oxygen(diff)	7.00	7.60
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
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R. A. Houser

R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 5, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us Kent Coal Industrial

Test #6
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12-12-78

Date received 2-23-79

P.O. #323-15900

Analysis report no. 71- 28226

PROXIMATE ANALYSIS

As Rec'd Dry Basis

% Moisture	6.70	xxxxx
% Ash	9.71	10.41
% Volatile	32.53	34.87
% Fixed Carbon	51.06	54.72
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	12417	13309
% Sulfur	0.85	0.91

ULTIMATE ANALYSIS

As Rec'd Dry Basis

% Moisture	6.70	xxxxx
% Carbon	70.15	75.19
% Hydrogen	4.60	4.93
% Nitrogen	1.25	1.34
% Chlorine	0.12	0.13
% Sulfur	0.85	0.91
% Ash	9.71	10.41
% Oxygen(diff)	6.62	7.09
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 284-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 5, 1979

Sample identified by
KVB, Inc.

Kind of sample reported to us Kent Coal Industrial

Test #7
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/14/78

Date received 2-23-79

P.O. #323-15900

Analysis report no. 71- 28230

PROXIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	4.81	xxxxx
% Ash	9.89	10.39
% Volatile	32.97	34.64
% Fixed Carbon	52.33	54.97
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	12957	13612
% Sulfur	1.01	1.06

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	4.81	xxxxx
% Carbon	72.43	76.09
% Hydrogen	4.67	4.91
% Nitrogen	0.94	0.99
% Chlorine	0.10	0.11
% Sulfur	1.01	1.06
% Ash	9.89	10.39
% Oxygen(diff)	6.15	6.45
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 6, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us Kentucky Industrial Coal Test No. 8
Sample taken at ----- Test Site: E
Sample taken by KVB, Inc.
Date sampled 12/15/78
Date received 2/23/79

Analysis report no. 71- 28234

PROXIMATE ANALYSIS

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>		<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	4.65	xxxxx	% Moisture	4.65	xxxxx
% Ash	5.80	6.08	% Carbon	75.98	79.69
% Volatile	47.67	50.00	% Hydrogen	5.01	5.25
% Fixed Carbon	41.88	43.92	% Nitrogen	1.20	1.26
	<u>100.00</u>	<u>100.00</u>	% Chlorine	0.15	0.16
Btu/lb.	13519	14178	% Sulfur	0.73	0.77
% Sulfur	0.73	0.77	% Ash	5.80	6.08
			% Oxygen(diff)	6.48	6.79
				<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
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R. A. Houser

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R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us Kentucky Industrial Coal Test No. 9
Sample taken at ----- Test Site: E
Sample taken by KVB, Inc.
Date sampled 12/16/78
Date received 2/23/79

Analysis report no. 71- 28238

<u>PROXIMATE ANALYSIS</u>			<u>ULTIMATE ANALYSIS</u>		
	<u>As Rec'd</u>	<u>Dry Basis</u>		<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	5.27	xxxxx	% Moisture	5.27	xxxxx
% Ash	10.25	10.82	% Carbon	71.53	75.51
% Volatile	32.77	34.59	% Hydrogen	4.58	4.83
% Fixed Carbon	51.71	54.59	% Nitrogen	1.44	1.52
	<u>100.00</u>	<u>100.00</u>	% Chlorine	0.09	0.09
Btu/lb.	12666	13371	% Sulfur	0.77	0.81
% Sulfur	0.77	0.81	% Ash	10.25	10.82
			% Oxygen(diff)	6.07	6.42
				<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
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R. A. Houser
R. A. HOUSER, manager, Midwest Division



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OFFICE TEL. (312) 264-1173

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identified
by
KVB

Kind of sample reported to us Kent Industrial Coal
Sample taken at -----
Sample taken by KVB
Date sampled 12/18/78
Date received 2/23/79

Test No. 11
Test Site: E

Analysis report no. 71- 28242

PROXIMATE ANALYSIS

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	5.23	xxxxx
% Ash	10.19	10.75
% Volatile	33.73	35.59
% Fixed Carbon	50.85	53.66
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	12790	13495
% Sulfur	0.89	0.94

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	5.23	xxxxx
% Carbon	71.43	75.37
% Hydrogen	4.70	4.96
% Nitrogen	1.49	1.57
% Chlorine	0.17	0.18
% Sulfur	0.89	0.94
% Ash	10.19	10.75
% Oxygen(diff)	5.90	6.23
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

169 *R. A. Houser*
R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

KVB, Inc.

Kind of sample reported to us **Crushed Coal** Test No. 12
Sample taken at ----- Test Site: E
Sample taken by **KVB, Inc.**
Date sampled **12/20/78**
Date received **2/23/79**

Analysis report no. **71- 28246**

PROXIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	6.09	xxxxx
% Ash	8.76	9.33
% Volatile	33.00	35.14
% Fixed Carbon	52.15	55.53
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	12793	13623
% Sulfur	0.78	0.83

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	6.09	xxxxx
% Carbon	71.65	76.30
% Hydrogen	4.72	5.03
% Nitrogen	1.44	1.53
% Chlorine	0.21	0.22
% Sulfur	0.78	0.83
% Ash	8.76	9.33
% Oxygen(diff)	6.35	6.76
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

▶ **KVB, INC.**
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification
by **KVB, Inc.**

Kind of sample reported to us **Crushed Coal**
Sample taken at **----**
Sample taken by **KVB, Inc.**
Date sampled **12/20/78**
Date received **2/23/79**

Test No. **13**
Test Site: **E**

Analysis report no. **71- 28250**

	<u>PROXIMATE ANALYSIS</u>			<u>ULTIMATE ANALYSIS</u>	
	<u>As Rec'd</u>	<u>Dry Basis</u>		<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	5.93	xxxxx	% Moisture	5.93	xxxxx
% Ash	10.35	11.00	% Carbon	70.56	75.01
% Volatile	33.38	35.49	% Hydrogen	4.61	4.90
% Fixed Carbon	50.34	53.51	% Nitrogen	1.31	1.39
	<u>100.00</u>	<u>100.00</u>	% Chlorine	0.14	0.15
Btu/lb.	12565	13358	% Sulfur	0.68	0.72
% Sulfur	0.68	0.72	% Ash	10.35	11.00
			% Oxygen(diff)	6.42	6.83
			<u>100.00</u>	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

171 *R. A. Housen*

R. A. HOUSEN, Manager, Midwest Division



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PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

► KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us **Crushed Coal**

Test No. 14
Test Site: E

Sample taken at ----

Sample taken by **KVB, Inc.**

Date sampled **12/20/78**

Date received **2/23/79**

Analysis report no. **71- 28252**

PROXIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	5.04	xxxxx
% Ash	8.13	8.56
% Volatile	34.12	35.93
% Fixed Carbon	<u>52.71</u>	<u>55.51</u>
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	13135	13832
% Sulfur	0.67	0.71

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	5.04	xxxxx
% Carbon	73.64	77.55
% Hydrogen	4.82	5.08
% Nitrogen	1.32	1.39
% Chlorine	0.08	0.08
% Sulfur	0.67	0.71
% Ash	8.13	8.56
% Oxygen(diff)	<u>6.30</u>	<u>6.63</u>
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
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R. A. Houser

R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Analysis report no. 71-28253
KVB, Inc.

Kind of sample reported to us: Eastern Kentucky Coal

Test No. 15
Test Site: E

Sample taken at: ----

Sample taken by: KVB, Inc.

Date sampled: 1/5/79

Date received: 2/23/79

Analysis report no. 71- 28253

PROXIMATE ANALYSIS

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>		<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	5.04	xxxxx	% Moisture	5.04	xxxxx
% Ash	8.41	8.86	% Carbon	72.59	76.45
% Volatile	34.92	36.77	% Hydrogen	4.80	5.06
% Fixed Carbon	51.63	54.37	% Nitrogen	1.39	1.46
	<u>100.00</u>	<u>100.00</u>	% Chlorine	0.09	0.10
Btu/lb.	12958	13646	% Sulfur	0.81	0.85
% Sulfur	0.81	0.85	% Ash	8.41	8.86
			% Oxygen(diff)	6.87	7.22
				<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser
R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 5, 1979

Sample identified
by KVB, Inc.

Kind of sample reported to us Eastern Kent Coal
Sample taken at -----
Sample taken by KVB, Inc.
Date sampled 1/8/79
Date received 2-23-79

Test #16
Test Site: E

P.O. #323-15900

Analysis report no 71- 28257

PROXIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	7.57	xxxxx
% Ash	8.01	8.67
% Volatile	34.02	36.81
% Fixed Carbon	50.40	54.52
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	12486	13508
% Sulfur	0.74	0.80

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	7.57	xxxxx
% Carbon	70.02	75.75
% Hydrogen	4.60	4.98
% Nitrogen	0.86	0.93
% Chlorine	0.07	0.08
% Sulfur	0.74	0.80
% Ash	8.01	8.67
% Oxygen(diff)	8.13	8.79
	<u>100.00</u>	<u>100.00</u>

Respectfully submitted,
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R. A. Houser

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R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 6, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us Kentucky Coal

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 1/19/79

Date received 2/23/79

Test No. 20
Test Site: E

Analysis report no. 71- 28265

PROXIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	8.61	xxxxx
% Ash	8.33	9.11
% Volatile	32.38	35.43
% Fixed Carbon	50.68	55.46
	<u>100.00</u>	<u>100.00</u>
Btu/lb.	12460	13634
% Sulfur	0.99	1.08

ULTIMATE ANALYSIS

	<u>As Rec'd</u>	<u>Dry Basis</u>
% Moisture	8.61	xxxxx
% Carbon	69.89	76.48
% Hydrogen	4.58	5.01
% Nitrogen	1.19	1.30
% Chlorine	0.08	0.09
% Sulfur	0.99	1.08
% Ash	8.33	9.11
% Oxygen(diff)	6.33	6.93
	<u>100.00</u>	<u>100.00</u>

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R. A. HOUSER, Manager, Midwest Division


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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Kind of sample reported to us Eastern Kentucky Coal

Sample identification by KVB, Inc.

Sample taken at -----

Test No. Composite
Test Site: E

Sample taken by KVB, Inc.

Date sampled -----

Date received 2/23/79

PROXIMATE ANALYSIS	Analysis report no. 71- 28271		ULTIMATE ANALYSIS	% Weight	
	As received	Dry basis		As received	Dry basis
% Moisture	2.44	xxxxx	Moisture	2.44	xxxxx
% Ash	8.26	8.47	Carbon	74.26	76.12
% Volatile	36.17	37.07	Hydrogen	4.90	5.02
% Fixed Carbon	53.13	54.46	Nitrogen	1.35	1.38
	100.00	100.00	Chlorine	0.09	0.09
Btu/lb.	13224	13555	Sulfur	0.77	0.79
% Sulfur	0.77	0.79	Ash	8.26	8.47
% Alk. as Na ₂ O	xxxxx	0.14	Oxygen (diff)	7.93	8.13
				100.00	100.00
SULFUR FORMS			MINERAL ANALYSIS OF ASH	% Weight Ignited Basis	
% Pyritic Sulfur	0.15	0.15	Silica, SiO ₂	49.80	
% Sulfate Sulfur	0.01	0.01	Alumina, Al ₂ O ₃	36.27	
% Organic Sulfur	0.61	0.63	Titania, TiO ₂	1.63	
			Ferric oxide, Fe ₂ O ₃	5.19	
WATER SOLUBLE ALKALIES			Lime, CaO	2.07	
% Na ₂ O =	xxxxx	xxxx	Magnesia, MgO	0.88	
% K ₂ O =	xxxxx	xxxx	Potassium oxide, K ₂ O	2.07	
			Sodium oxide, Na ₂ O	0.25	
FUSION TEMPERATURE OF ASH	Reducing	Oxidizing			
Initial Deformation	2700+ °F	°F	Sulfur trioxide, SO ₃	1.15	
Softening (H=W)	2700+ °F	°F	Phos. pentoxide, P ₂ O ₅	0.43	
Softening (H=1/2W)	2700+ °F	°F	Undetermined	0.06	
Fluid	2700+ °F	°F		100.00	
% EQUILIBRIUM MOISTURE =	xxxx		SILICA VALUE =	85.95	
HARDGROVE GRINDABILITY INDEX =	37		BASE: ACID RATIO	0.12	
FREE SWELLING INDEX =	4 1/2		T _{25p} Temperature =	2900+°F	

*These ignited basis results were used to calculate undetermined value above
%Strontium oxide, SrO 0.08
%Barium oxide, BaO 0.11
%Manganese oxide, Mn₃O₄ 0.01

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

March 8, 1979

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

Sample identification
by KVB, INC.

Kind of sample reported to us **Crushed**

Test No. **Crushed Composite**
Test Site: **E**

Sample taken at **----**

Sample taken by **KVB, INC.**

Date sampled **12/20/78**

Date received **2/23/79**

Analysis report no. 71- 28270			% Weight		
PROXIMATE ANALYSIS	As received	Dry basis	ULTIMATE ANALYSIS	As received	Dry basis
% Moisture	2.49	XXXXX	Moisture	2.49	XXXXX
% Ash	8.10	8.31	Carbon	75.79	77.73
% Volatile	35.05	35.95	Hydrogen	5.02	5.15
% Fixed Carbon	54.36	55.74	Nitrogen	1.00	1.03
	100.00	100.00	Chlorine	0.14	0.14
Btu/lb.	13508	13853	Sulfur	0.76	0.78
% Sulfur	0.76	0.78	Ash	8.10	8.31
% Alk. as Na ₂ O	XXXXX	0.17	Oxygen (diff)	6.70	6.86
				100.00	100.00
<u>SULFUR FORMS</u>			<u>MINERAL ANALYSIS OF ASH</u>	% Weight Ignited Basis	
% Pyritic Sulfur	0.08	0.08	Silica, SiO ₂	52.03	
% Sulfate Sulfur	0.00	0.00	Alumina, Al ₂ O ₃	33.59	
% Organic Sulfur	0.68	0.70	Titania, TiO ₂	1.66	
<u>WATER SOLUBLE ALKALIES</u>			Ferric oxide, Fe ₂ O ₃	5.34	
% Na ₂ O =	----	----	Lime, CaO	1.95	
% K ₂ O =	----	----	Magnesia, MgO	1.08	
<u>FUSION TEMPERATURE OF ASH</u>	<u>Reducing</u>	<u>Oxidizing</u>	Potassium oxide, K ₂ O	2.56	
Initial Deformation	2700+ °F	---- °F	Sodium oxide, Na ₂ O	0.32	
H is Cone Height	Softening (H=W) 2700+ °F	---- °F	Sulfur trioxide, SO ₃	0.76	
W is Cone Width	Softening (H= 1/2 W) 2700+ °F	---- °F	Phos. pentoxide, P ₂ O ₅	0.49	
	Fluid 2700+ °F	---- °F	Undetermined	0.06*	
% EQUILIBRIUM MOISTURE =	----	----		100.00	
HARDGROVE GRINDABILITY INDEX =	41		SILICA VALUE =	86.14	
FREE SWELLING INDEX =	6 1/2		BASE: ACID RATIO	0.13	
			T ₂₅₀ Temperature =	2890 °F	

*These ignited basis results were used to calculate undetermined value above

XStrontium oxide, SrO 0.00
 XBarium oxide, BaO 0.13
 XManganese oxide, Mn₃O₄ 0.03

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

178 *R. A. Houser*
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

► **KVB, INC.**
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

March 8, 1979

Kind of sample reported to us **Kent Coal**

Sample taken at -----

Sample taken by **KVB, INC.**

Date sampled **1/19/79**

Date received **2/23/79**

Sample identification by **KVB, INC.**

Test No. Composite
Test Site: E

PROXIMATE ANALYSIS	Analysis report no. 71- 28269		ULTIMATE ANALYSIS	% Weight	
	As received	Dry basis		As received	Dry basis
% Moisture	2.03	xxxxx	Moisture	2.03	xxxxx
% Ash	10.35	10.56	Carbon	74.33	75.87
% Volatile	34.12	34.83	Hydrogen	4.78	4.88
% Fixed Carbon	53.50	54.61	Nitrogen	0.92	0.94
	100.00	100.00	Chlorine	0.11	0.11
Btu/lb.	13193	13466	Sulfur	0.95	0.97
% Sulfur	0.95	0.97	Ash	10.35	10.56
% Alk. as Na ₂ O	xxxxx	0.16	Oxygen (diff)	6.53	6.67
				100.00	100.00
SULFUR FORMS			MINERAL ANALYSIS OF ASH	% Weight Ignited Bas	
% Pyritic Sulfur	0.18	0.18	Silica, SiO ₂	52.67	
% Sulfate Sulfur	0.00	0.00	Alumina, Al ₂ O ₃	31.68	
% Organic Sulfur	0.77	0.79	Titania, TiO ₂	3.71	
			Ferric oxide, Fe ₂ O ₃	6.22	
WATER SOLUBLE ALKALIES			Lime, CaO	1.64	
% Na ₂ O =	----	----	Magnesia, MgO	0.77	
% K ₂ O =	----	----	Potassium oxide, K ₂ O	1.88	
			Sodium oxide, Na ₂ O	0.26	
FUSION TEMPERATURE OF ASH	Reducing	Oxidizing			
Initial Deformation	2700+ °F	----- °F	Sulfur trioxide, SO ₃	0.81	
H is Cone Height Softening (H=W)	2700+ °F	----- °F	Phos. pentoxide, P ₂ O ₅	0.18	
W is Cone Width Softening (H=1/2W)	2700+ °F	----- °F	Undetermined	0.03*	
Fluid	2700+ °F	----- °F		100.00	
% EQUILIBRIUM MOISTURE =	----		SILICA VALUE =	85.92	
HARDGROVE GRINDABILITY INDEX =	47		BASE: ACID RATIO	0.12	
FREE SWELLING INDEX =	7 1/2		T₂₅₀ Temperature =	2900+°F	

*These ignited basis results were used to calculate undetermined value above

%Strontium oxide, SrO 0.00

%Barium oxide, BaO 0.14

%Manganese oxide, Mn₃O₄ 0.01

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser

179 R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

March 2, 1979

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

Sample Identification
by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#2
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	-----	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28211

	<u>Dry Basis</u>
%Ash.....	92.00
%Combustible.....	8.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#2
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	-----	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28213

Dry Basis

%Ash.....	47.29
%Combustible.....	52.71

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser
R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Multi-clone Ash
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	----
Date received	2/23/79

Test No. 2
Test Site: E

Analysis report no. 71- 28212

	<u>Dry Basis</u>
%Ash.....	49.15
%Combustible.....	50.85

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. House
R. A. HOUSE, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173



KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 2, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Economizer Collector	Test #3,
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/18/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28217

Dry Basis

%Ash.....	34.75
%Combustible.....	65.25

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R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#3
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/18/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28216

	<u>Dry Basis</u>
%Ash.....	44.53
%Combustible.....	55.47

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#3
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	-----	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28215

	<u>Dry Basis</u>
%Ash.....	94.32
%Combustible.....	5.68

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



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16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Bottom Ash Sample	Test#4
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/20/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28219

	<u>Dry Basis</u>
%Ash.....	91.76
%Combustible.....	8.24

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

186

R. A. Houser
R. A. HOUSER, Manager, Midwest Division



Charter Member

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OFFICE TEL. (312) 264-1173

► KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#4
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/20/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28220

	<u>Dry Basis</u>
%Ash.....	57.74
%Combustible.....	42.26

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Economizer Ash

Test#4
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 11/20/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28221

Dry Basis

%Ash.....	58.42
%Combustible.....	41.58

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

March 9, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Economizer
Sample taken at	----
Sample taken by	KVB, INC.
Date sampled	11/21/78
Date received	2/23/79

Test #5
Test Site: E

Analysis report no. 71- 28225

Dry Basis

%Ash.....	55.86
%Combustible.....	44.14

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#5
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/21/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28223

	<u>Dry Basis</u>
%Ash.....	93.25
%Combustible.....	6.75

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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► KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#5
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/21/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28224

	<u>Dry Basis</u>
%Ash.....	61.74
%Combustible.....	38.26

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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► KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#6
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/12/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28227

	<u>Dry Basis</u>
%Ash.....	89.49
%Combustible.....	10.51

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R. J. Houser
R. J. HOUSER, Manager, Coal Test Division



Charter Member

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HENDERSON, KY • MIDDLESBORO, KY • MOBILE, AL • NEW ORLEANS, LA • NORFOLK, VA • PIKEVILLE, KY • VANCOUVER, B.C. CAN.

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OFFICE TEL. (312) 264-1173

March 2, 1979

► KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

Sample identification
by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#6
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/12/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28229

Dry Basis

%Ash.....	52.30
%Combustible.....	47.70

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Dust Collector Ash

Test#6
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/12/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28228

	<u>Dry Basis</u>
%Ash.....	42.17
%Combustible.....	57.83

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Bottom	Test#7
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/14/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28231

	<u>Dry Basis</u>
%Ash.....	89.90
%Combustible.....	10.10

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R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample Identification
by KVB, INC.

Kind of sample reported to us Dust Collector Ash

Test#7
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/14/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28232

Dry Basis

%Ash..... 57.02
%Combustible..... 42.98

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Houser

R. A. HOUSER, Manager, Midwest Division



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▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#7
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/14/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28233

	<u>Dry Basis</u>
%Ash.....	55.66
%Combustible.....	44.34

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COMMERCIAL TESTING & ENGINEERING CO.

R. A. Rouser
R. A. ROUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#8
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/15/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28235

	<u>Dry Basis</u>
%Ash.....	93.03
%Combustible.....	6.97

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Rouser
R. A. ROUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#8
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/15/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28236

	<u>Dry Basis</u>
%Ash.....	57.30
%Combustible.....	42.70

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Hopper Ash

Test#8
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/15/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28237

Dry Basis

%Ash.....	52.04
%Combustible.....	47.96

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Houser

R. A. HOUSER, Manager, Midwest Division



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A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Bottom Ash

Test#9
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/16/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28239

Dry Basis

%Ash.....	83.07
%Combustible.....	16.93

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Dust Collector Ash

Test#9
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/16/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28240

Dry Basis

%Ash.....	51.41
%Combustible.....	48.59

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R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Economizer Hopper Ash	Test#9
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/16/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28241

	<u>Dry Basis</u>
%Ash.....	69.05
%Combustible.....	30.95

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

203 *R. A. House*
R. A. HOUSE, Manager, Midwest Division



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OFFICE TEL. (312) 284-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#11
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/18/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28243

	<u>Dry Basis</u>
%Ash.....	84.16
%Combustible.....	15.84

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204 *R. A. Houser*
R. A. HOUSER, Manager, Midwest Division



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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Dust Collector Ash

Test#11
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/18/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28244

Dry Basis

%Ash.....	65.79
%Combustible.....	34.21

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#11
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/18/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28245

Dry Basis

%Ash.....	48.23
%Combustible.....	51.77

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Bottom Ash

Test#12
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/20/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28247

Dry Basis

%Ash.....	88.47
%Combustible.....	11.53

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R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 284-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 2, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us Dust Collector Ash

Test #12, 13 & 14
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/20/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28248

Dry Basis

%Ash..... 46.14
%Combustible..... 53.86

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

March 2, 1979

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

Sample identification
by KVB, Inc.

Kind of sample reported to us Economizer Hopper Ash

Test #12, 13 & 14
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/20/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28249

Dry Basis

%Ash..... 46.02

%Combustible..... 53.98

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser

R. A. HOUSER, Manager, Midwest Division

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Charter Member

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COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Bottom Ash

Test#13
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 12/20/78

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28251

	<u>Dry Basis</u>
%Ash.....	92.30
%Combustible.....	7.70

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

March 2, 1979

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

Sample identification
by KVB, INC.

Kind of sample reported to us Bottom Ash

Test#15
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 1/5/79

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28254

Dry Basis

%Ash.....	87.37
%Combustible.....	12.63

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample Identification
by KVB, INC.

Kind of sample reported to us Dust Collector Ash

Test#15
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 1/5/79

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28255

	<u>Dry Basis</u>
%Ash.....	42.85
%Combustible.....	57.15

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Economizer Hopper Ash

Test#15
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 1/5/79

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28256

Dry Basis

%Ash.....	28.80
%Combustible.....	71.20

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. House

R. A. HOUSE, Manager, Midwest Division



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OFFICE TEL. (312) 284-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Bottom Ash
Sample taken at -----
Sample taken by KVB, Inc.
Date sampled 1/8/79
Date received 2/23/79

Test#16
Test Site: E

P/O# 323-15900

Analysis report no. 71- 28258

	<u>Dry Basis</u>
%Ash.....	89.54
%Combustible.....	10.46
%Sulfur.....	0.08

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214 *R. A. Houser*
R. A. HOUSER, Manager, Midwest Division



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A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Dust Collector Ash

Test#16
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 1/8/79

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28259

Dry Basis

%Ash.....	43.05
%Combustible.....	56.95
%Sulfur.....	0.39

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Economizer Ash

Test#16
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 1/8/79

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28260

	<u>Dry Basis</u>
%Ash.....	52.11
%Combustible.....	47.89
%Sulfur.....	1.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

216 *R. A. Houser*
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

March 2, 1979

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

Sample identification
by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#17
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/10/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28262

	<u>Dry Basis</u>
%Ash.....	93.61
%Combustible.....	6.39
%Sulfur.....	0.11

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

217 *R. A. Houser*
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Dust Collector Ash
Sample taken at -----
Sample taken by KVB, Inc.
Date sampled 1/10/79
Date received 2/23/79

Test#17
Test Site: E

P/O# 323-15900

Analysis report no. 71- 28263

	<u>Dry Basis</u>
%Ash.....	66.98
%Combustible.....	33.02
%Sulfur.....	0.25

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R. A. Houser
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173



KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Economizer Hopper Ash	Test#17
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/10/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28264

Dry Basis

%Ash.....	48.32
%Combustible.....	51.68
%Sulfur.....	0.65

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

219 *R. A. Houser*
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 284-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#20
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/19/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28266

	<u>Dry Basis</u>
%Ash.....	91.93
%Combustible.....	8.07

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.
220 *R. A. House*
R. A. HOUSE, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us Dust Collector Ash

Test#20
Test Site: E

Sample taken at -----

Sample taken by KVB, Inc.

Date sampled 1/19/79

Date received 2/23/79

P/O# 323-15900

Analysis report no. 71- 28267

Dry Basis

%Ash.....	51.51
%Combustible.....	48.49

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

221 *R. A. Houser*
R. A. HOUSER, Manager, Midwest Division



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OFFICE TEL. (312) 264-1173

▶ KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification
by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#20
		Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/19/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28268

	<u>Dry Basis</u>
%Ash.....	53.76
%Combustible.....	46.24

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division



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COMBUSTIBLES DATA SHEET

SITE E

Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	Combustibles
43	TEST #6 BLR OUT	7.8499	10.6735	0.8234	10.1601	0.5134	62.3
		9.8502	10.6736		10.1601		
		9.8503	—		—		
		AVG. 9.8501	10.6735		10.1601		
39	TEST #7 BLR OUT	10.0003	10.6715	0.6712	10.1663	0.5054	75.3
		10.0005	10.6718		10.1662		
		10.0005	—		—		
		AVG. 10.0004	10.6716		10.1662		
35	TEST #8 BLR OUT	9.8310	10.5801	0.9714	10.1162	0.6863	70.6
		9.8311	10.5804		10.1162		
		9.8313	—		—		
		AVG. 9.8311	10.8025		10.1162		
42	TEST #9 BLR OUT	10.3687	11.3745	1.0059	10.7429	0.6317	62.8
		10.3690	11.3750		10.7431		
		10.3689	—		—		
		AVG. 10.3688	11.3747		10.7430		
34	TEST #11 BLR OUT	10.1717	11.2102	1.0385	10.6010	0.6093	58.6
		10.1719	11.2105		10.6011		
		10.1718	—		—		
		AVG. 10.1718	11.2103		10.6010		
38	TEST #12 BLR OUT	10.1474	11.5897	1.4424	10.8758	0.7141	49.5
		10.1475	11.5901		10.8758		
		10.1477	—		—		
		AVG. 10.1475	11.5899		10.8758		
36	TEST #13 BLR OUT	9.4581	10.3062	0.8480	9.8087	0.4977	58.6
		9.4584	10.3068		9.8089		
		9.4577	—		—		
		AVG. 9.4581	10.3065		9.8088		
20	TEST #14 BLR OUT	8.8413	9.7429	0.9015	8.9902	0.7528	83.5
		8.8416	9.7430		8.9900		
		8.8414	—		—		
		AVG. 8.8414	9.7429		8.9901		
21	TEST #15 BLR OUT	9.4794	10.5612	1.0816	9.9083	0.6530	60.3
		9.4797	10.5612		9.9082		
		9.4797	—		—		
		AVG. 9.4796	10.5612		9.9082		
22	TEST #20 BLR OUT	9.7279	10.6226	0.8946	9.9264	0.6964	77.8
		9.7282	10.6228		9.9262		
		9.7283	—		—		
		AVG. 9.7281	10.6227		9.9263		
	AVG.						

COMBUSTIBLES DATA SHEET

SITE E

Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combustibles
2	TEST #3 MECH SIDE AVG.	3.9727	3.9977	0.0250	3.9906	0.0072	28.8
		3.9728	3.9977		3.9905		
		3.9727	3.9978		3.9905		
		3.9727	3.9977		3.9905		
4	TEST #6 MECH SIDE AVG.	3.7108	4.5321	0.8213	4.0288	0.5034	61.2
		3.7110	4.5321		4.0286		
		3.7106	4.5322		4.0286		
		3.7108	4.5321		4.0287		
6	TEST #7 MECH SIDE AVG.	3.7397	4.7889	1.0493	4.0837	0.7056	67.2
		3.7399	4.7891		4.0835		
		3.7397	4.7892		4.0836		
		3.7398	4.7891		4.0836		
3	TEST #4 MECH SIDE AVG.	3.6688	3.6997	0.0309	3.6936	0.0062	20.0
		3.6686	3.6996		3.6934		
		3.6686	3.6996		3.6933		
		3.6687	3.6996		3.6934		
7	TEST #9 MECH SIDE AVG.	3.7836	3.9512	0.1677	3.8481	0.1030	61.4
		3.7832	3.9511		3.8481		
		3.7835	3.9511		3.8480		
		3.7834	3.9511		3.8481		
8	TEST #11 MECH SIDE AVG.	3.8303	4.8495	1.0194	4.2171	0.6325	62.0
		3.8303	4.8498		4.2172		
		3.8302	4.8497		4.2173		
		3.8303	4.8497		4.2172		
11	TEST #12 MECH SIDE AVG.	3.7116	4.6360	0.9247	4.1181	0.5181	56.0
		3.7116	4.6365		4.1182		
		3.7115	4.6364		4.1182		
		3.7116	4.6363		4.1182		
12	TEST #13 MECH SIDE AVG.	3.9451	4.6418	0.6969	4.2451	0.3971	56.9
		3.9451	4.6420		4.2447		
		3.9450	4.6421		4.2448		
		3.9451	4.6420		4.2449		
	AVG.						
	AVG.						
	AVG.						

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 2

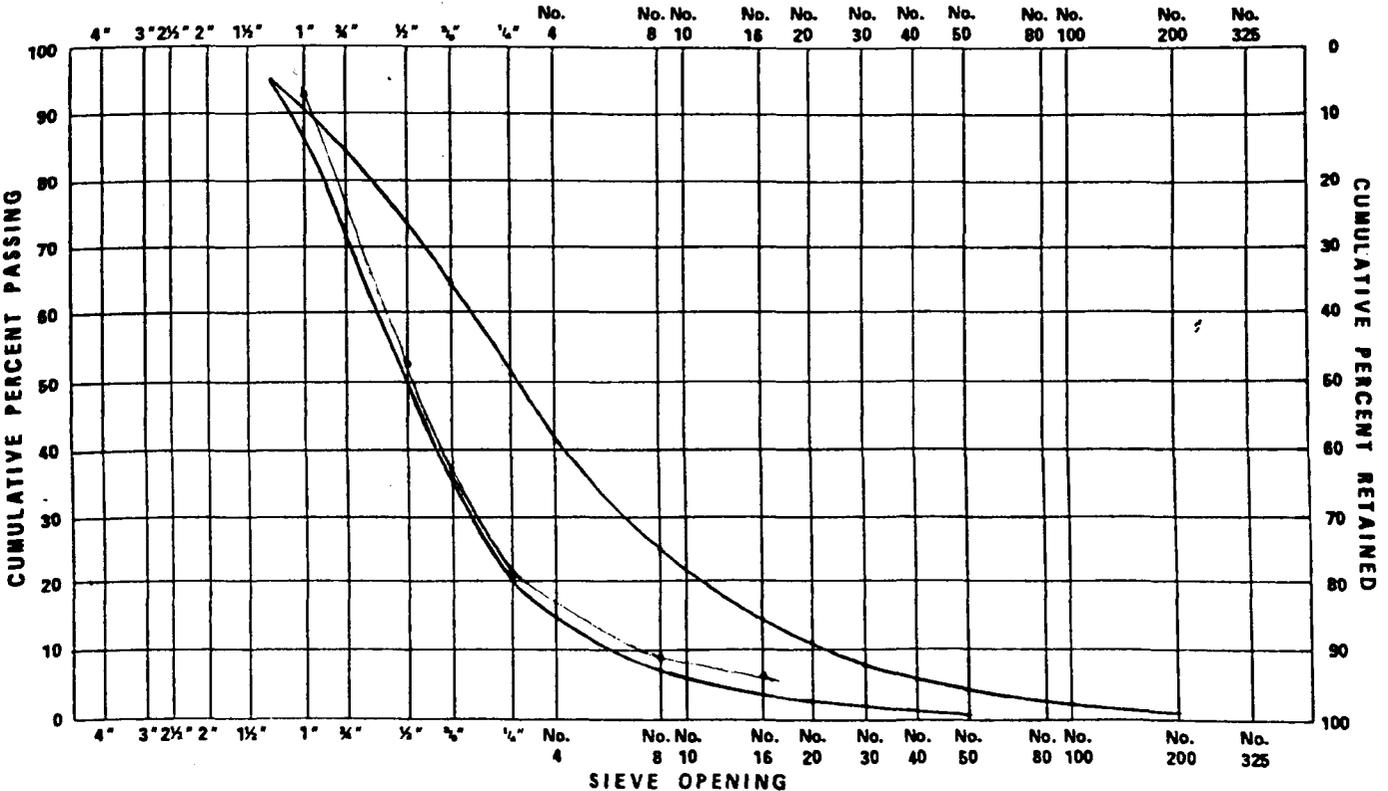
DATE SAMPLE TAKEN 11-16

TEST SITE L

TEST PERFORMED BY WCS

SAMPLE IDENTIFICATION Kent Creek - Industrial Mine

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.3	426.8 376.7	584.4	6.8	8615.5	100.0	3
1"	↓	1349.8 1396.7	3558.9	41.3	8031.1	93.2	3
3/4"		1252.3 1147.6	2697.3	31.3	4472.2	51.9	3
1/2"		1119.4	1010.1	11.7	1774.9	20.6	3
#8		458.4	349.1	4.1	764.8	8.9	3
#16		525.0	415.7	4.8	415.7	4.8	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 5

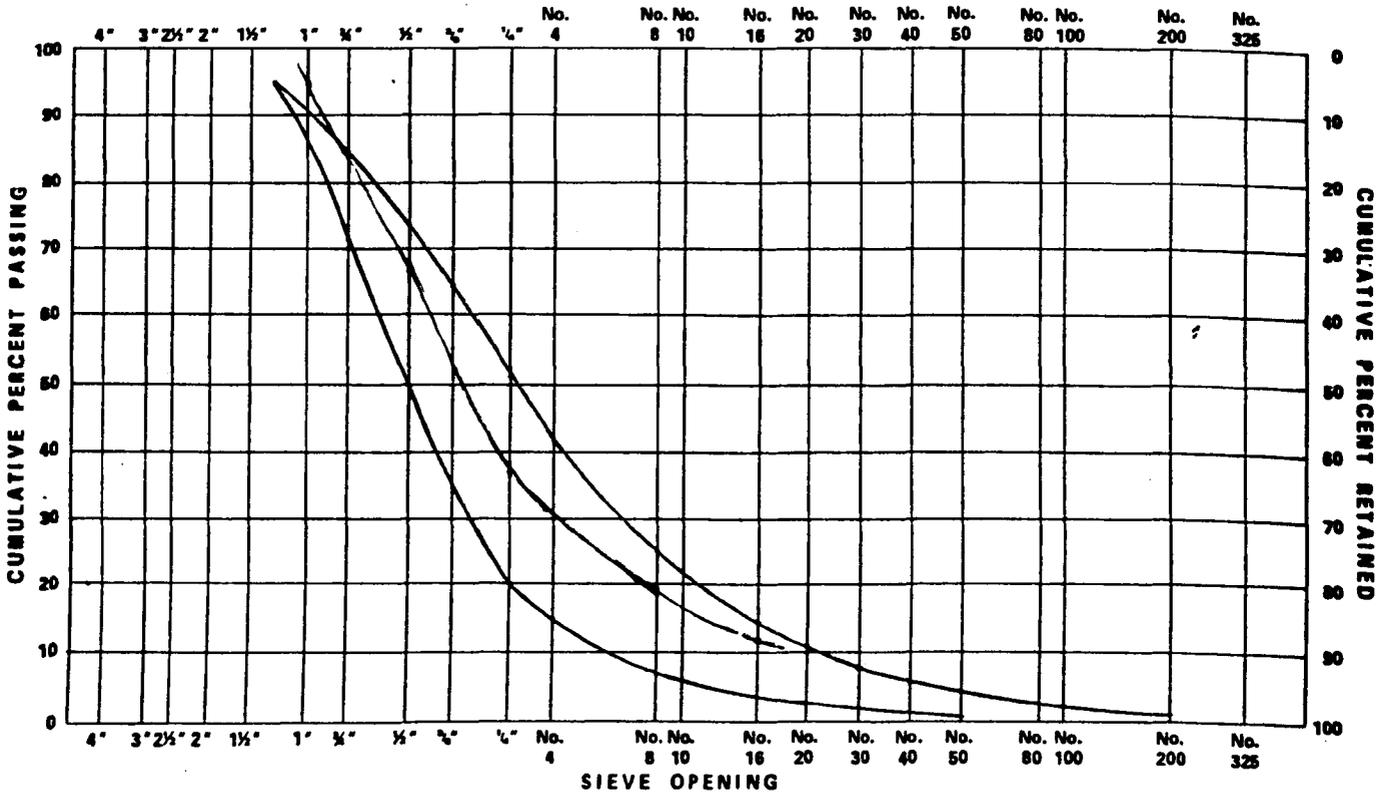
DATE SAMPLE TAKEN 11-18-78

TEST SITE E

TEST PERFORMED BY DB

SAMPLE IDENTIFICATION Kentucky Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	1087	3260 2236	372.2	4.4	8436.9	100.0	3
1"	↓	1529.8 1174.5	2486.9	29.5	8064.7	95.6	3
No. 10	↓	1237.6 1440.1	2460.3	29.2	5577.8	66.1	3
No. 20	↓	686.1 1060.4	1499.1	17.8	3117.5	36.9	3
No. 40	↓	741.8	633.1	7.6	1618.4	19.1	3
No. 60	↓	1094.0	985.3	11.7	985.3	11.6	3



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 4

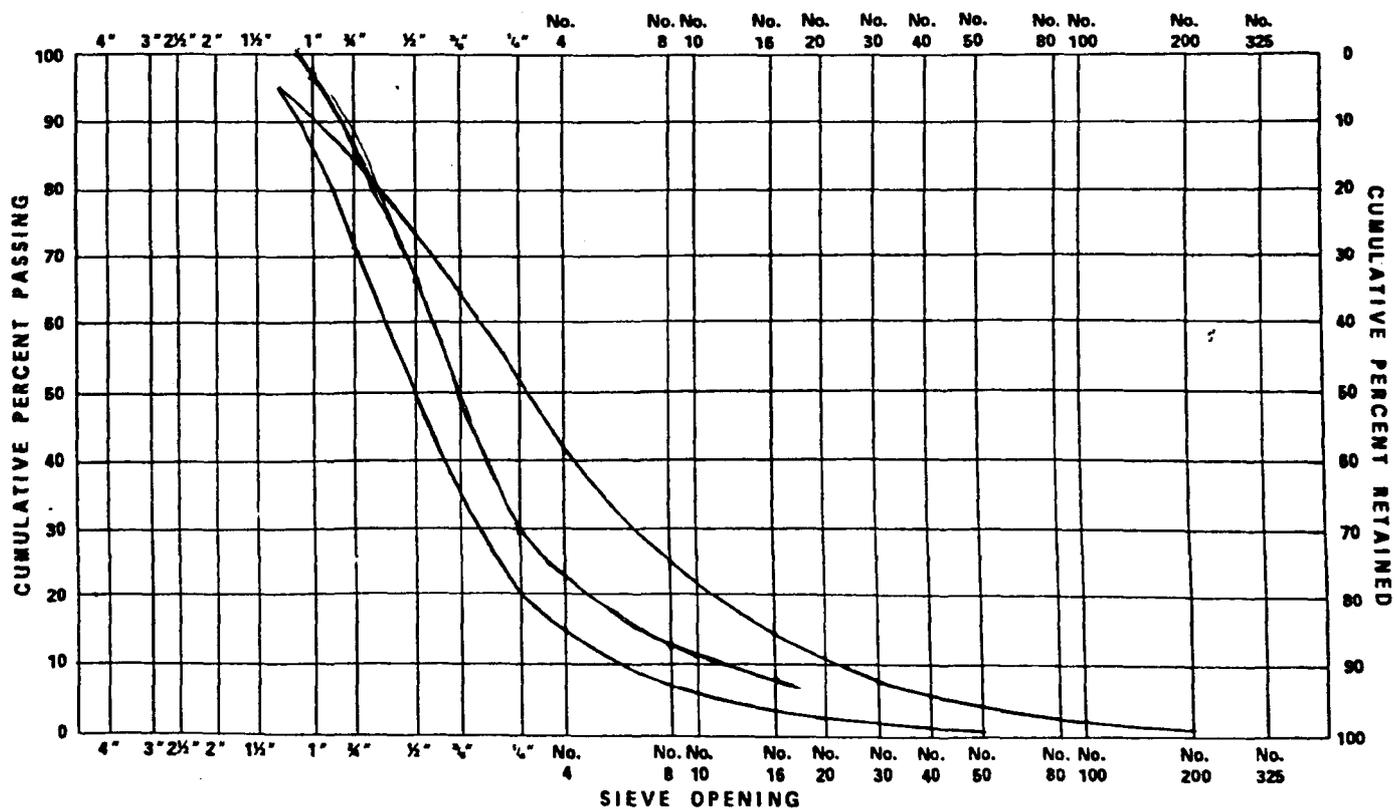
DATE SAMPLE TAKEN 11-20-78

TEST SITE E

TEST PERFORMED BY JLB

SAMPLE IDENTIFICATION Kent Cool

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.1	297.7 132.0	210.3	3.2	6566.3	100.0	3
1"	↓	1319.2 931.2	2031.0	30.9	6356.0	96.8	3
1/2"		1142.0 1470.3	2392.9	36.4	4325.0	65.9	3
3/4"		457.4 864.0	1102.0	16.8	1932.1	29.5	3
# 8		449.3	339.6	5.2	830.1	12.7	3
# 16		600.2	490.5	7.5	490.5	7.5	3



227

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 5

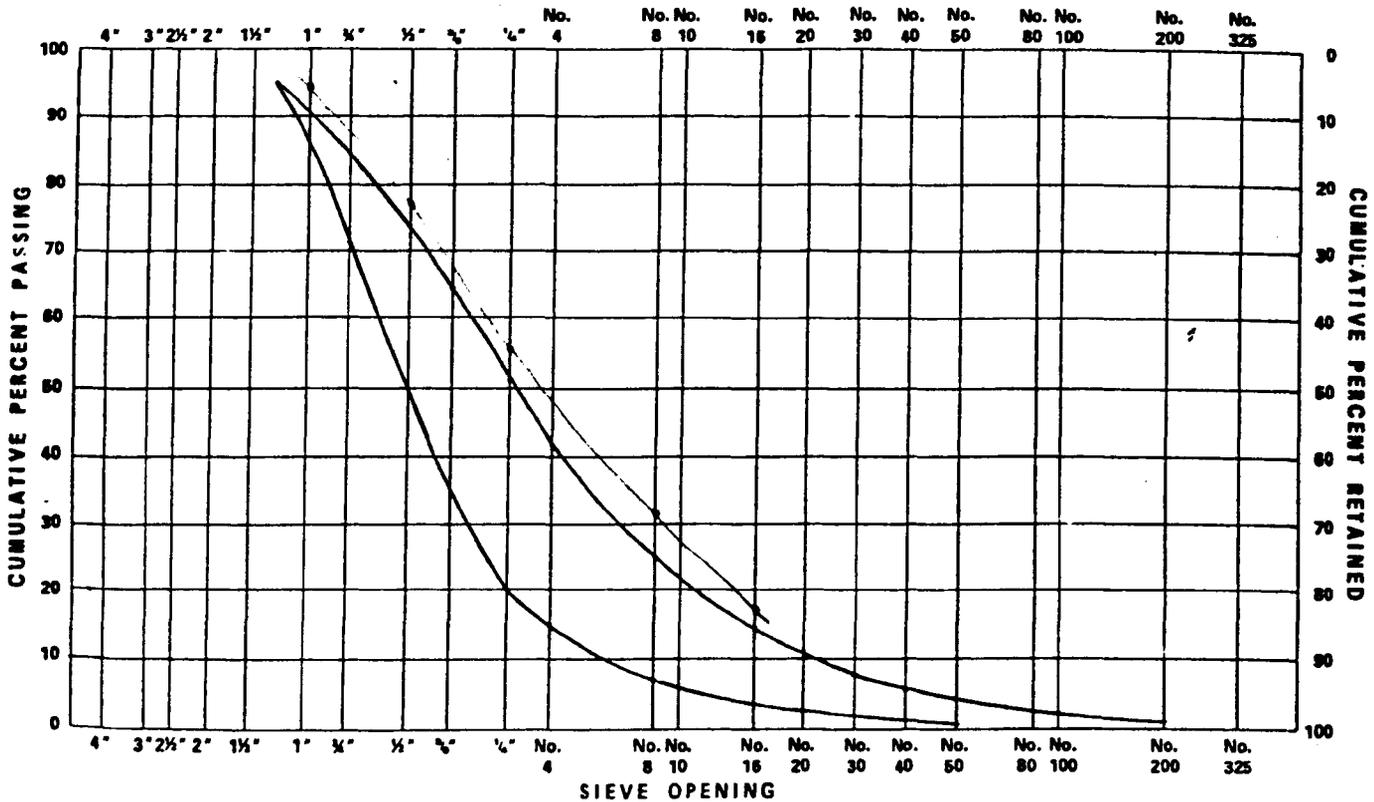
DATE SAMPLE TAKEN 11-21-78

TEST SITE E

TEST PERFORMED BY JBS

SAMPLE IDENTIFICATION Kentucky Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	175.8 424.5	380.3	4.9	7805.9	100.0	3
1"	↓	835.2 1000.5	1415.7	18.1	2425.6	95.1	3
1/2"		909.7 1098.5	1748.2	22.4	6009.9	77.0	3
3/4"		1091.2 420.2	1791.4	22.9	4261.7	54.6	3
#8		1238.3	1128.3	14.5	2470.3	31.7	3
#16		1452.0	1342.0	17.2	1342.0	17.2	3



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 6

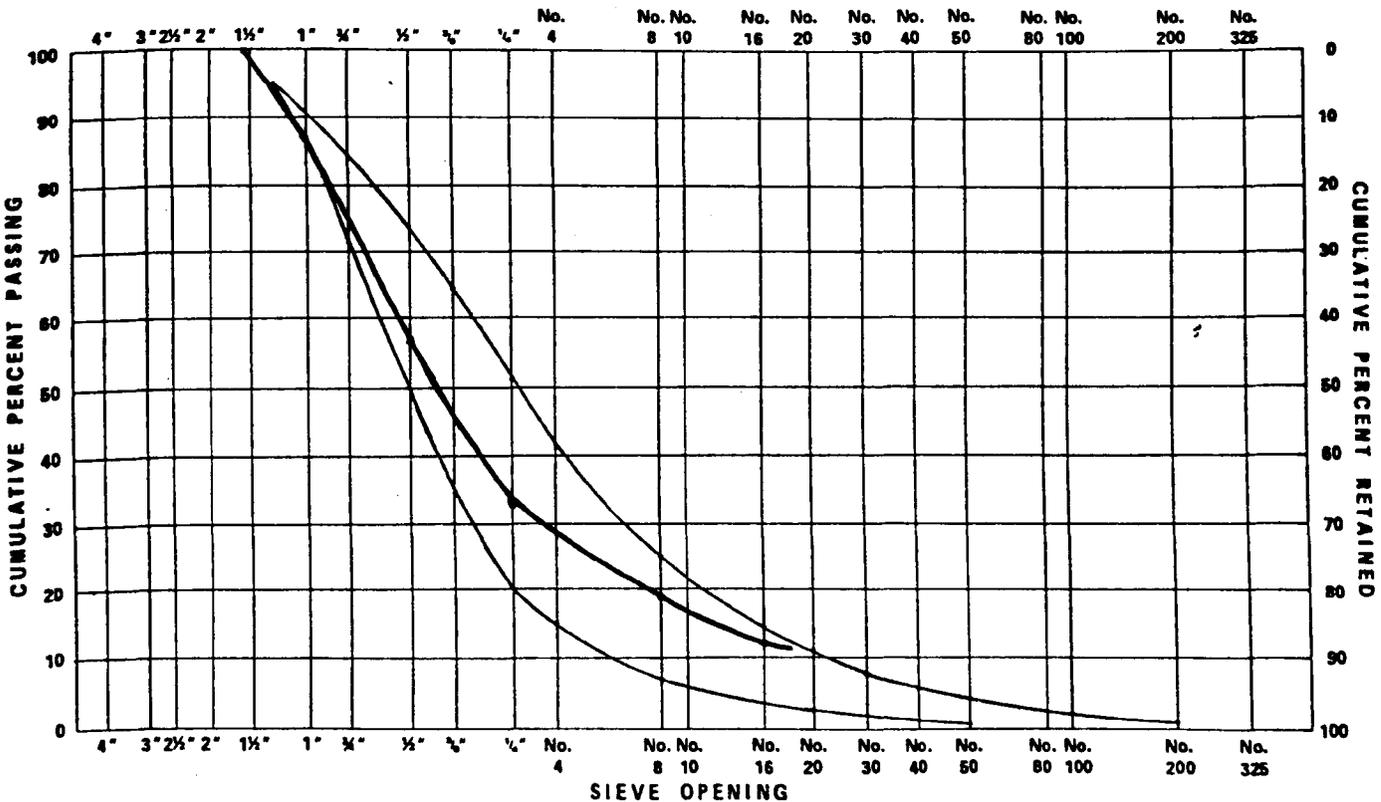
DATE SAMPLE TAKEN 12-12-78

TEST SITE E

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Kentucky - Industrial

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.8	677.4 521.5	919.3	13.4	6865.1	100.0	3
1"	↓	1314.3 959.3	2054.0	29.9	5945.8	86.6	3
1/2"		965 825.5	1572.4	22.4	3891.2	56.7	3
3/4"		1121.2	1011.4	14.7	2319.4	33.8	3
#8		546.0	436.2	6.4	1308.4	19.1	3
#16		184.3 907.1	871.8	12.7	871.8	12.7	3



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 7

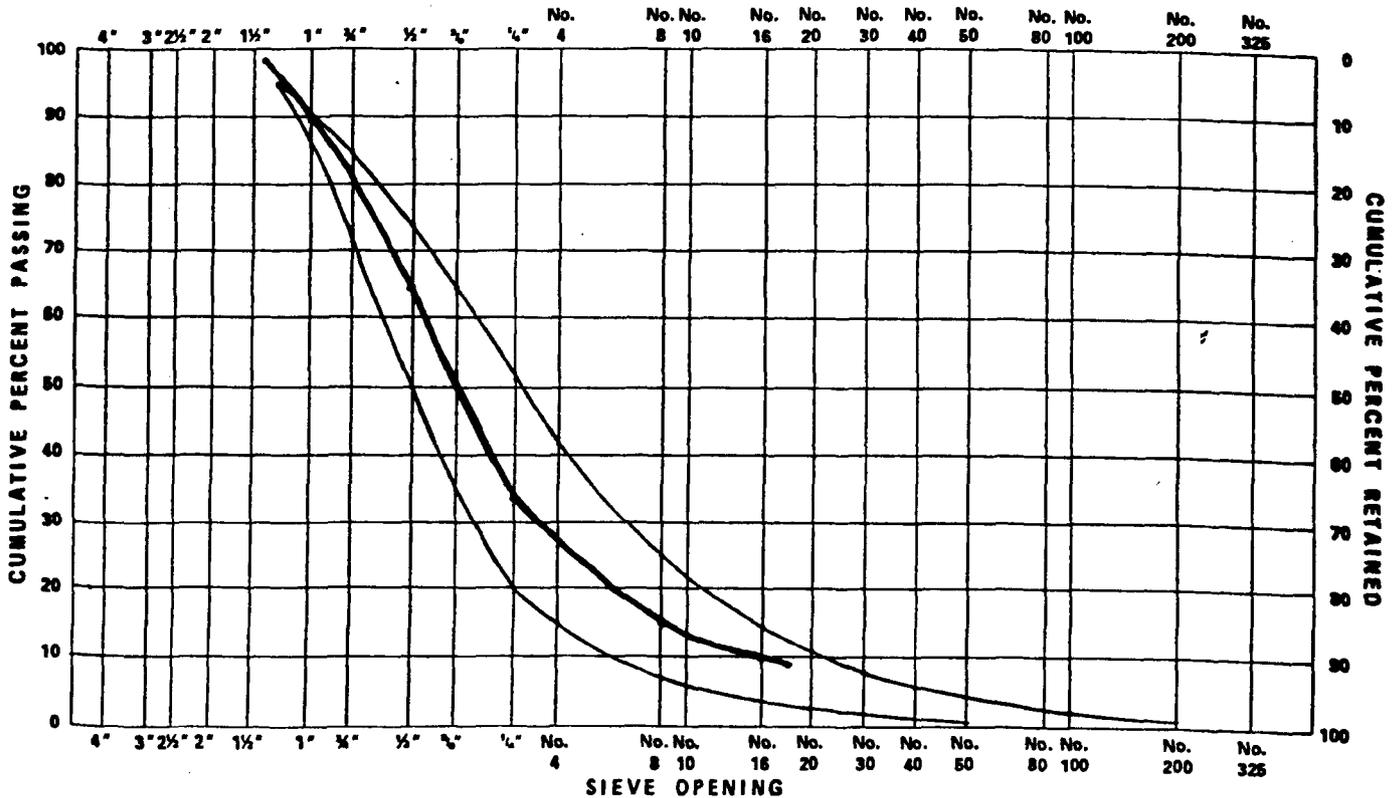
DATE SAMPLE TAKEN 12-14-78

TEST SITE E

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Kentucky Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.5	436.5 650.1	867.6	10.6	8206.4	100.0	3
1"	↓	1012.4 1206.0	1999.4	24.4	7338.8	89.5	3
3/4"		1373.8 1402.5	2557.3	31.2	5339.4	65.1	3
1/2"		907.8 840.6	1529.4	18.6	2782.1	33.9	3
#8		560.0	450.5	5.5	1252.7	15.3	3
#16		911.7	802.2	9.8	802.2	9.8	3



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 8

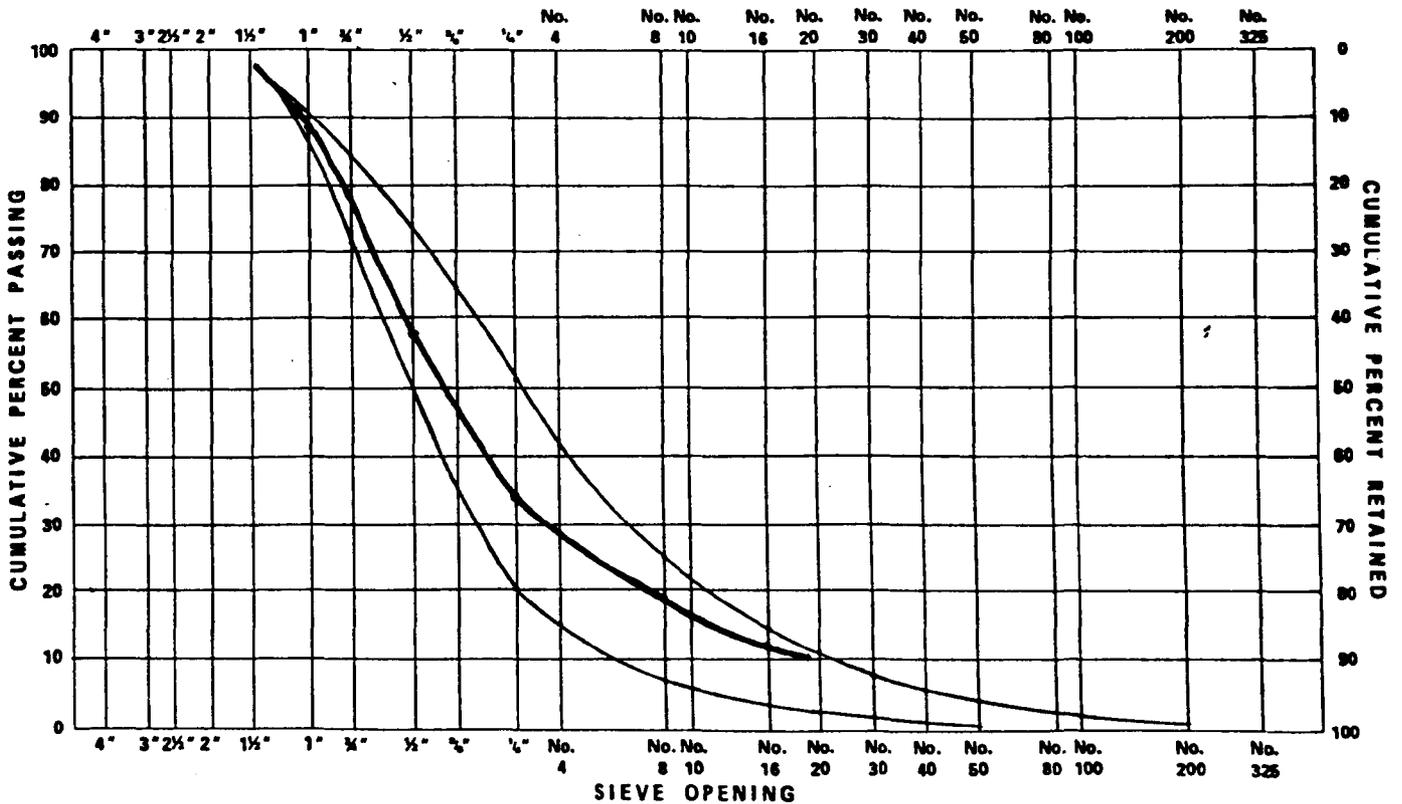
DATE SAMPLE TAKEN 12-15-78

TEST SITE E

TEST PERFORMED BY JTB

SAMPLE IDENTIFICATION Kent Industrial

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	104.5	383.0 759.9	922.9	12.1	7601.6	100.0	3
1"		1280.5 1284.2	2345.7	30.9	6678.7	87.9	3
1/2"		931.7 1013.6	1726.3	22.7	4333.0	57.0	3
1/4"		700.1 727.7	1208.8	15.9	2606.7	34.3	3
#8		583.2	473.7	6.2	1347.9	18.4	3
#16	↓	1033.7	924.2	12.2	924.2	12.2	3



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 9

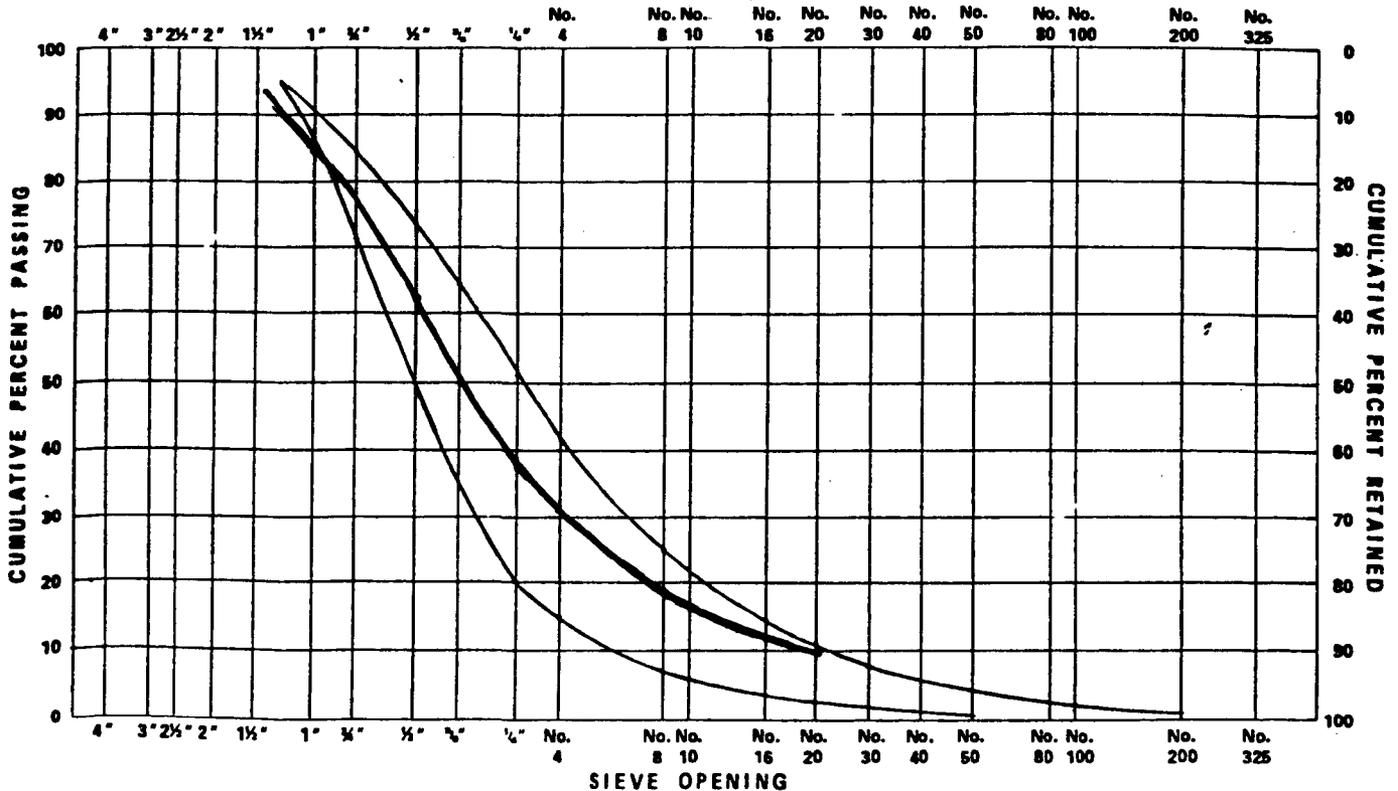
DATE SAMPLE TAKEN 12-16-78

TEST SITE E

TEST PERFORMED BY VOB

SAMPLE IDENTIFICATION KENTUCKY COAL (INDUSTRIAL)

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	1095	636.0 832.8	1249.8	14.7	8511.4	100.0	3
1"	↓	941.2 1262.1	1984.3	23.3	7261.6	85.3	3
1/2"		999.9 1310.9	2091.8	24.6	5277.3	62.0	3
1/4"		753.7 1014.1	1548.6	18.2	3185.5	37.4	3
# 8		701.1	591.6	7.0	1636.7	19.2	3
# 16		1154.6	1045.1	12.3	1045.1	12.2	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 11

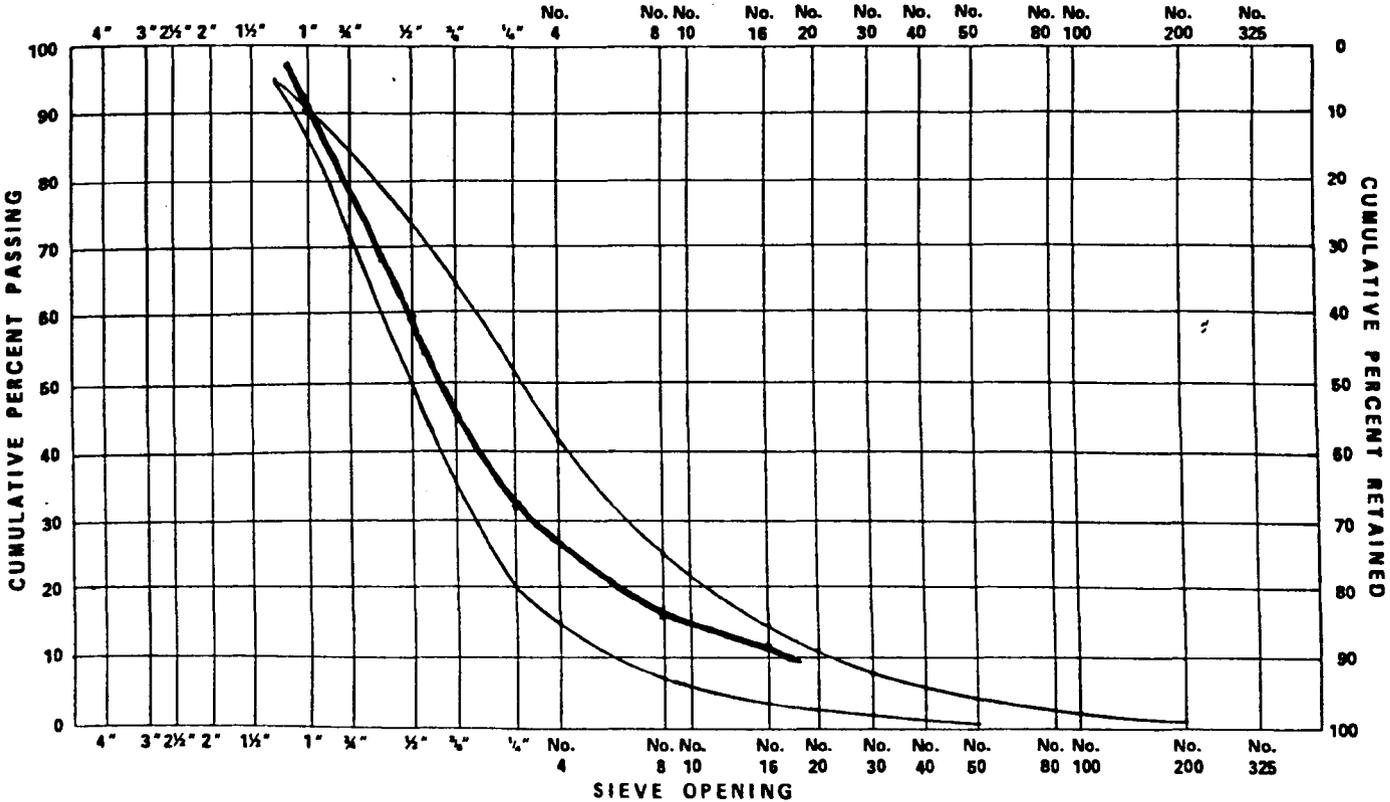
DATE SAMPLE TAKEN 12-18-78

TEST SITE E

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Keat-Industrial

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	190.5	565.4 511.8	858.2	96	8922.0	100.0	3
1"	↓	1373.1 1648.9	2803.0	31.4	8063.8	90.4	3
1/2"		1219.4 1465.4	2465.8	27.6	5260.8	59.0	3
3/4"		710.3 885.9	1377.2	15.4	2795.0	31.4	3
#8		577.5	468.0	5.3	1417.8	16.0	3
#16		1059.3	949.8	10.6	949.8	10.7	3



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 12

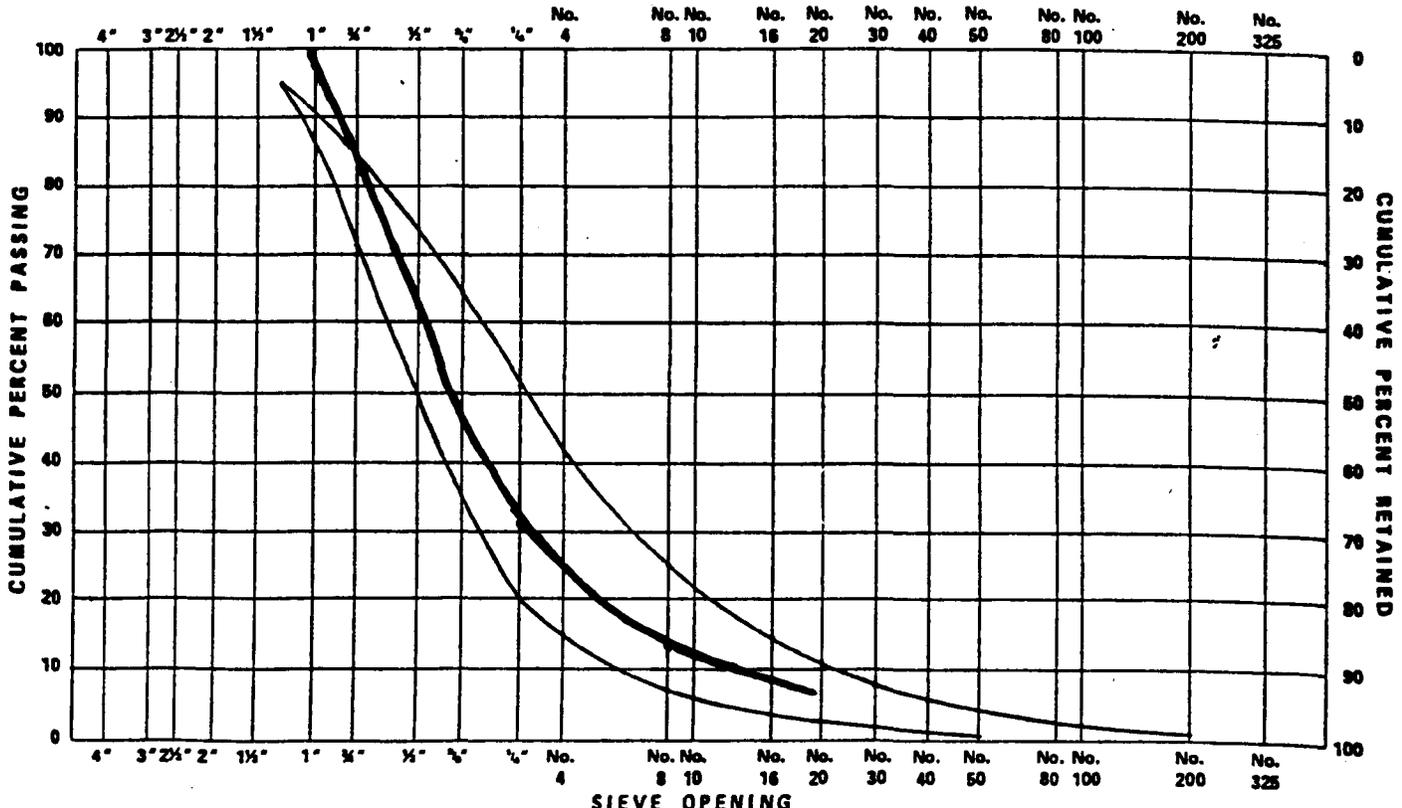
DATE SAMPLE TAKEN 12-20-78

TEST SITE E

TEST PERFORMED BY LB

SAMPLE IDENTIFICATION Crushed Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.5	180.7 157.6	149.5	2.3	6567.9	100.0	3
1"	↓	1239.4 1369.7	2388.1	36.4	6418.6	97.8	3
2"		1206.0 1047.4	2014.4	31.0	4030.5	61.4	3
4"		729.7 589.1	1099.8	16.7	1996.1	30.4	3
#8		449.8	340.3	5.2	896.3	13.7	3
#16		665.5	556.0	8.5	556.0	8.5	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 13

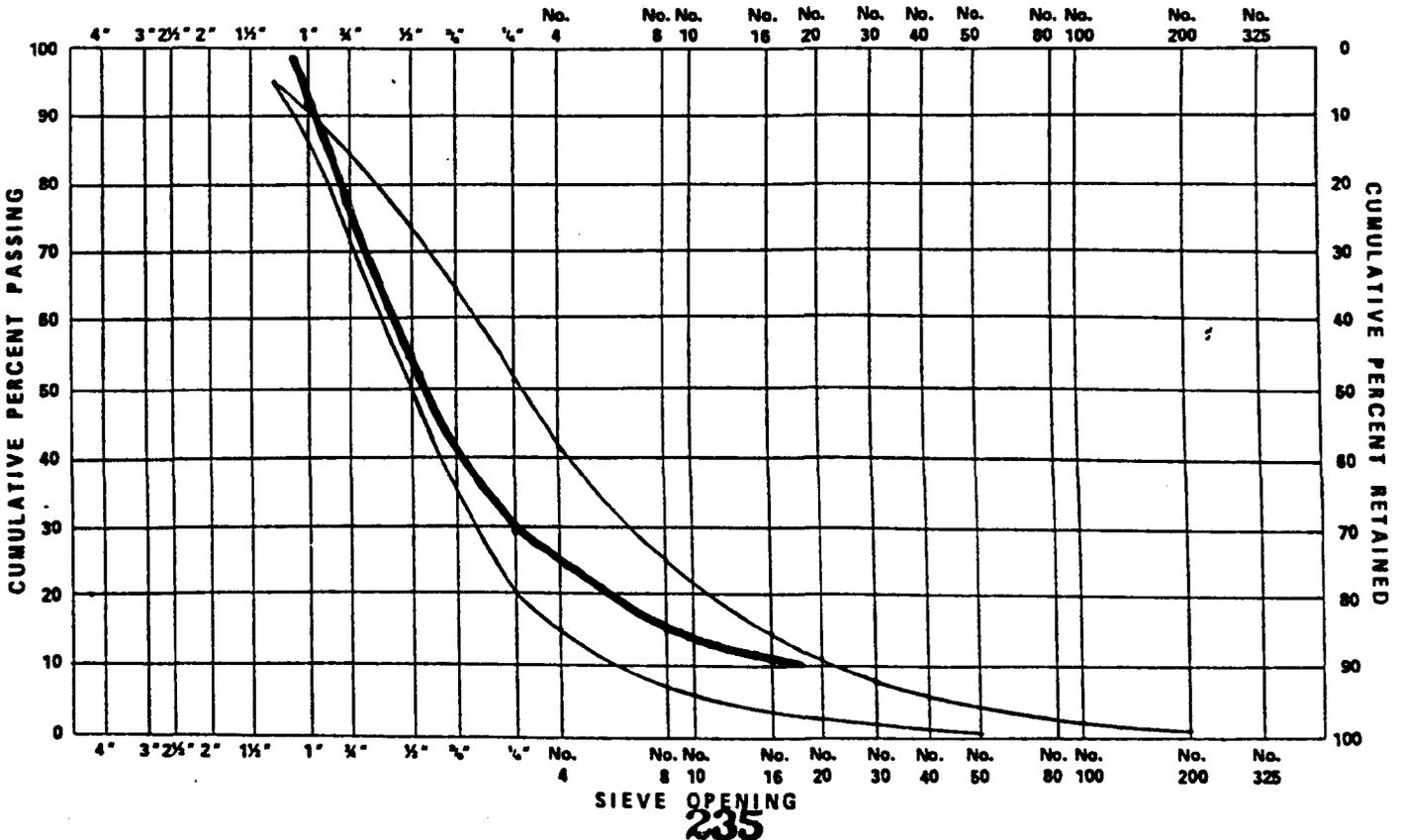
DATE SAMPLE TAKEN 12-20-25

TEST SITE E

TEST PERFORMED BY JBR

SAMPLE IDENTIFICATION Crushed Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	1095	2519 516.1	549.0	85	64515	100.0	3
1"	↓	1210.7 1426.2	2397.9	37.2	59025	915	3
1/2"		1019.2 834.8	1635.0	25.3	35046	543	3
1/4"		664.9 442.2	888.1	13.8	1889.6	29.0	3
#8		427.0	375	4.9	981.5	15.2	3
#16		773.5	664.0	10.3	664.0	10.3	3



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 14

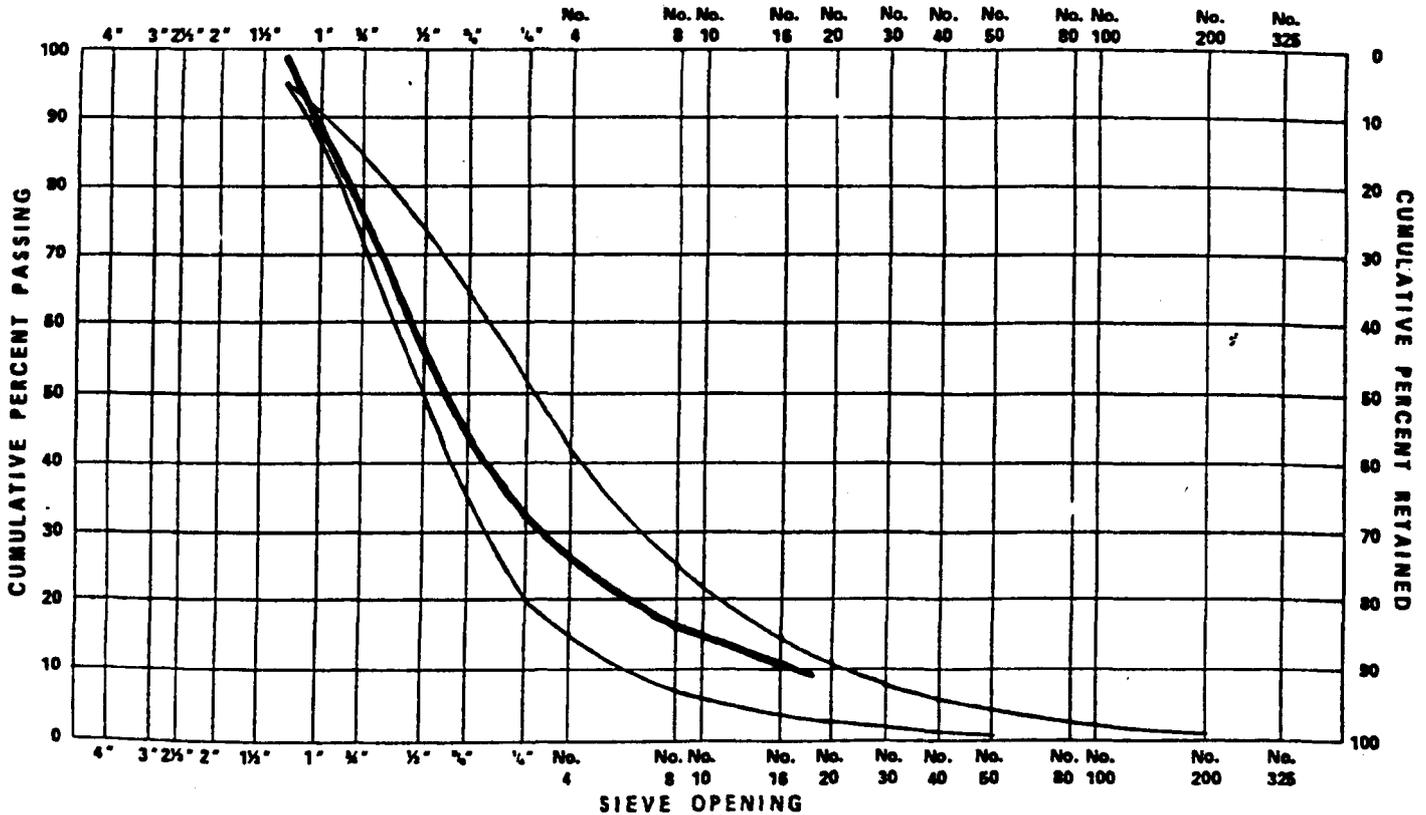
DATE SAMPLE TAKEN 12-20-78

TEST SITE E

TEST PERFORMED BY Job

SAMPLE IDENTIFICATION Crushed Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	1095	4664 7983	10757	11.5	9386.9	100.0	3
1"	↓	14144 18531	30485	32.5	8311.2	88.5	3
3/4"		12739 11427	2197.6	23.4	5262.7	56.0	3
1/2"		10726 6825	1536.1	16.4	3065.1	32.6	3
#8		6611	551.6	5.9	1524.0	16.2	3
#16		1086.9	97.4	10.4	977.4	10.3	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 15

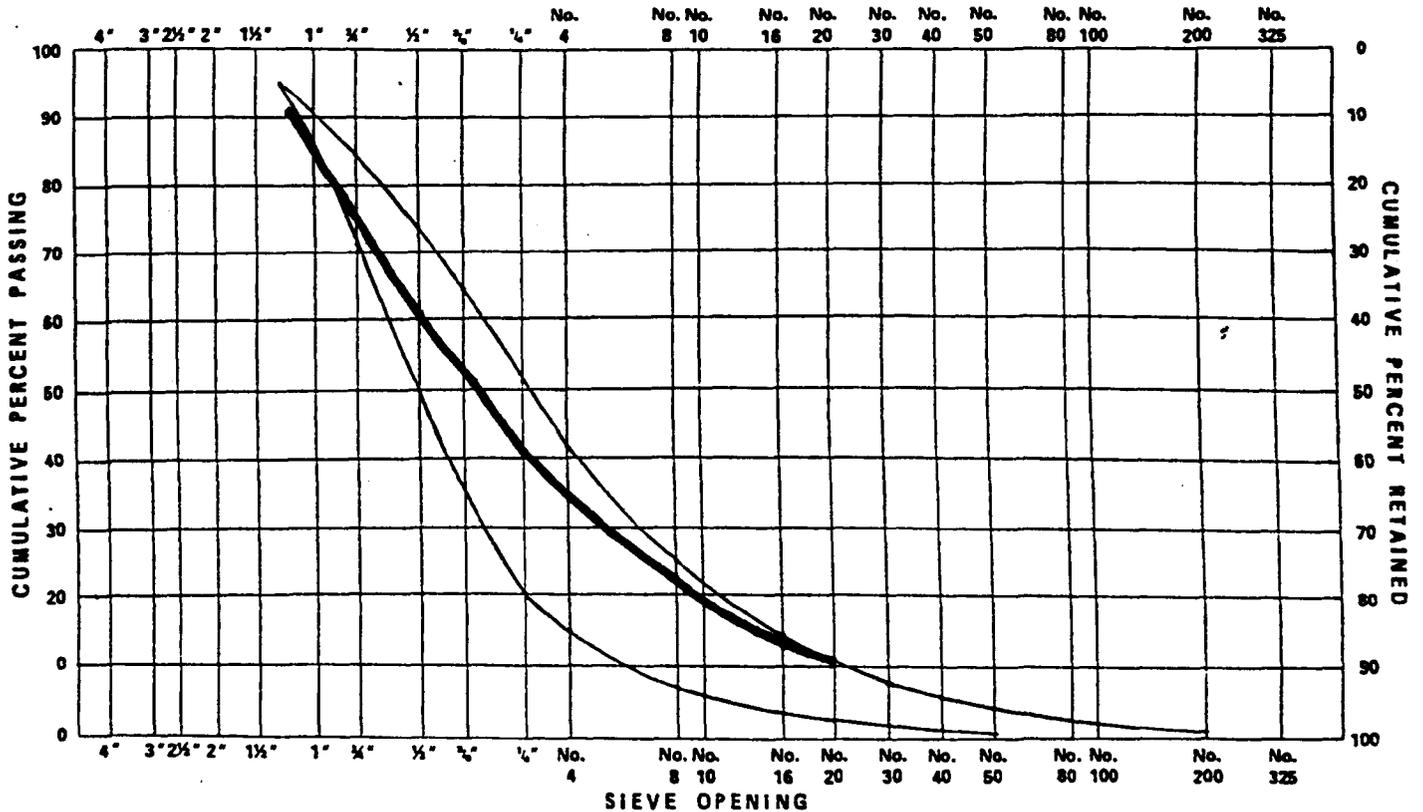
DATE SAMPLE TAKEN 1-5-79

TEST SITE E

TEST PERFORMED BY JCB

SAMPLE IDENTIFICATION Eastern Kentucky Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TAP	110.2	480.2 800.6	1060.4	14.3	7415.4	100.0	4
1"	↓	666.9 1400.2	1846.7	24.9	6355.0	85.7	4
1/2"		757.5 964.5	1501.6	20.2	4508.3	60.8	4
3/4"		715.5 903.6	1398.7	18.9	3006.7	40.6	4
#8		721.8	611.6	8.2	1608.0	21.7	4
#16		1106.6	996.4	13.4	996.4	13.5	4



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SIEVE ANALYSIS TEST REPORT

TEST NO. 16

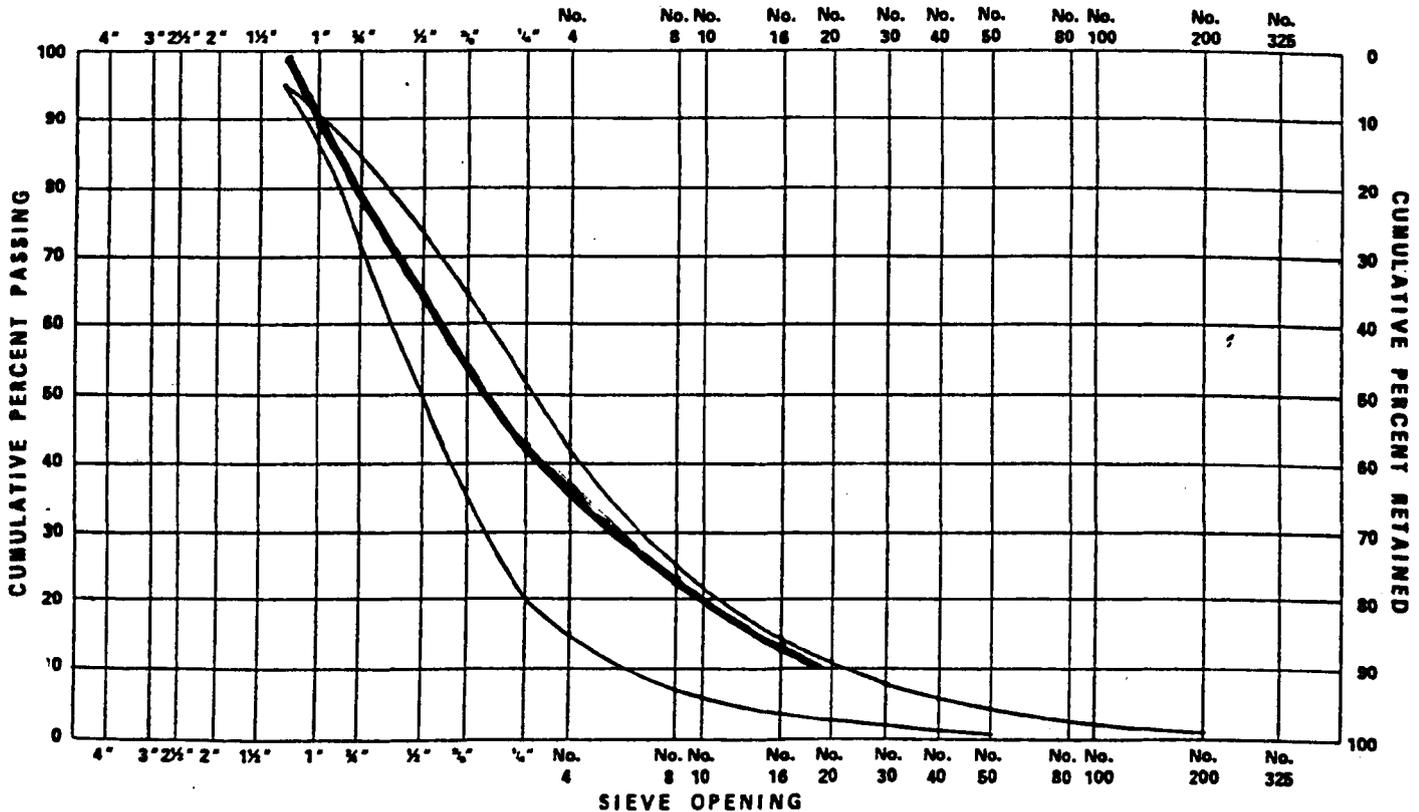
DATE SAMPLE TAKEN 1-8-79

TEST SITE E

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Eastern Kentucky Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)	
TOP	110.9	460.6 647.8	936.6	10.5	8891.7	100.0	4	
1"	↓	1260.3 1726.9	2265.4	25.5	7955.1	89.4	4	
1/2"		1319.6 894.1	1991.9	22.4	5689.7	63.9	4	
3/4"		910.2 976.4	1665.3	18.7	3697.8	41.5	4	
#8		939.0	828.1	9.3	2032.5	22.8	4	
#16			1315.3	1204.4	13.5	1204.4	13.5	4



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SIEVE ANALYSIS TEST REPORT

TEST NO. 17

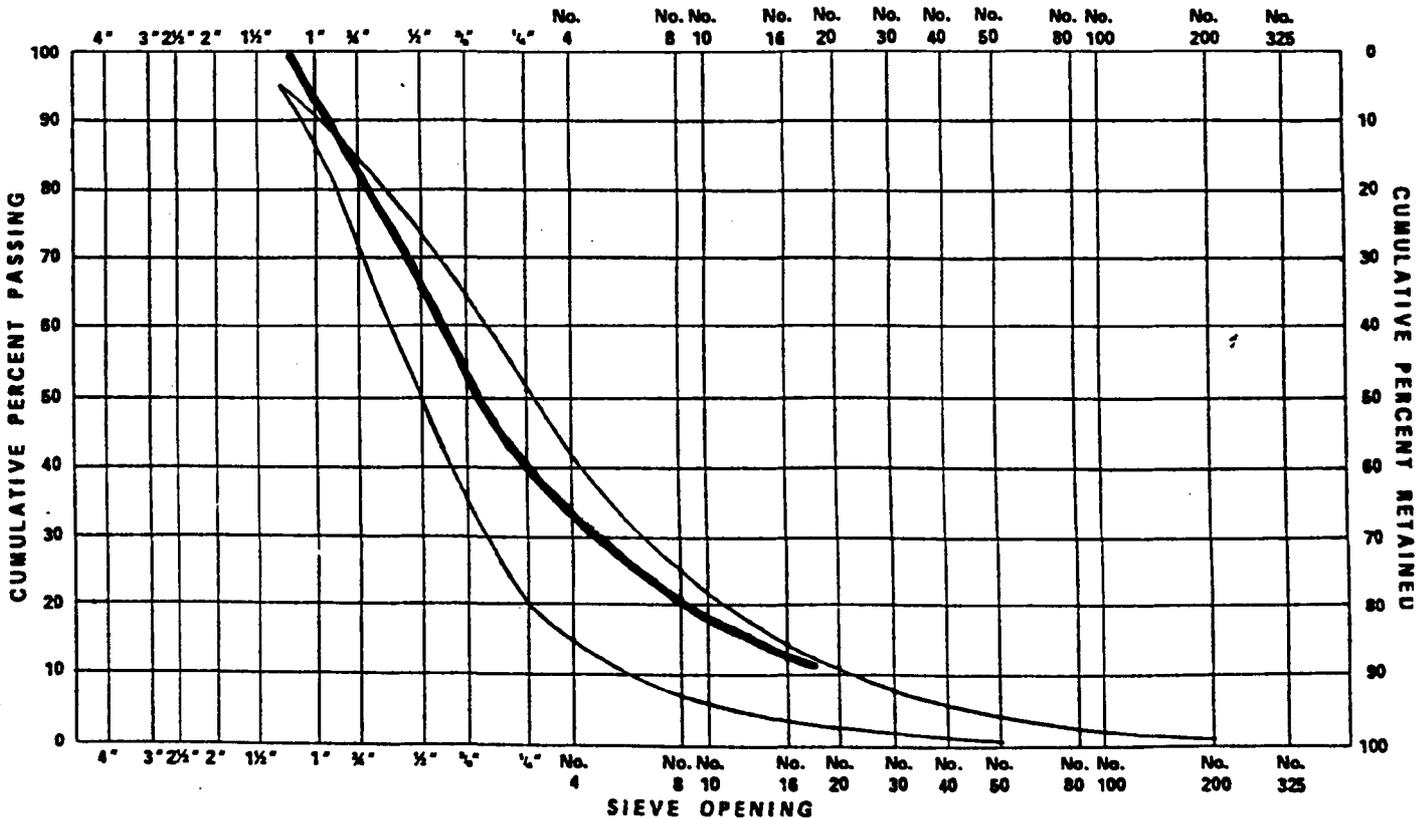
DATE SAMPLE TAKEN 1-10-79

TEST SITE ←

TEST PERFORMED BY JCS

SAMPLE IDENTIFICATION Kentucky Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.3	607.4	498.1	7.0	7071.0	100.0	4
1"	↓	1022.6	1899.4	26.9	6572.9	93.0	4
1 1/2"		1095.4					
2"		1001.5	1831.8	25.9	4673.5	66.1	4
4"		1048.9					
#4		818.5	1384.8	19.6	2841.7	40.2	4
#8		784.9					
#16	691.9	582.6	8.2	1456.9	20.6	4	
#30	983.6	874.3	12.4	974.3	12.4	4	



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SIEVE ANALYSIS TEST REPORT

TEST NO. 20

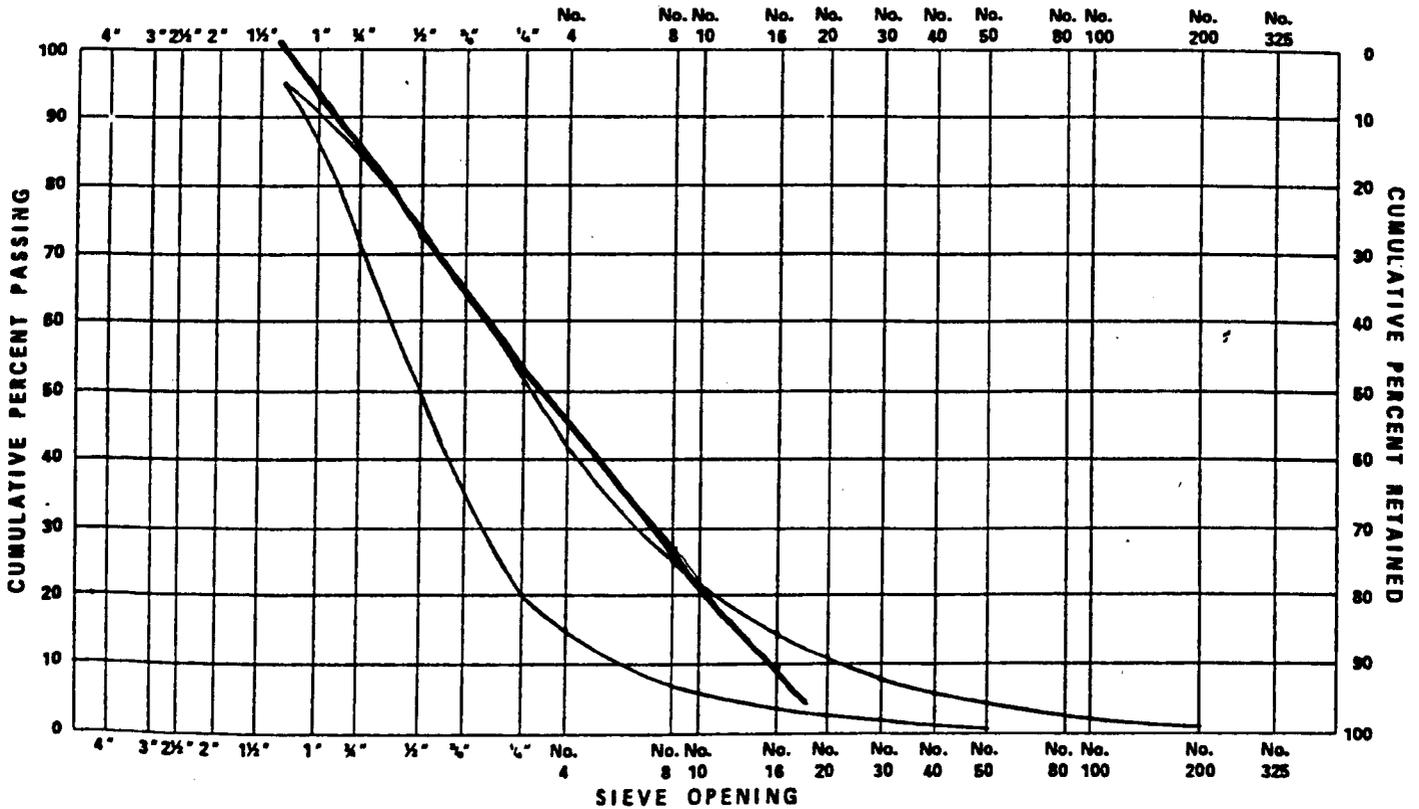
DATE SAMPLE TAKEN 1-11-77

TEST SITE E

TEST PERFORMED BY J.B.

SAMPLE IDENTIFICATION Kent

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)	
Top	110.7	40.8 322.2	511.6	6.6	7779.5	100.0	4	
1"	↓	888.0 878.3	1544.9	19.9	7267.9	93.4	4	
1/2"		1062.6 827.8	1669.0	21.5	5723.0	73.5	4	
3/8"		1271.7 76.7 324.2	2004.5	25.6	4054.0	52.0	4	
#4		763.7 742.7	1285.0	16.5	2049.5	26.2	4	
#10								
#16			875.2	764.5	9.8	764.5	9.7	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

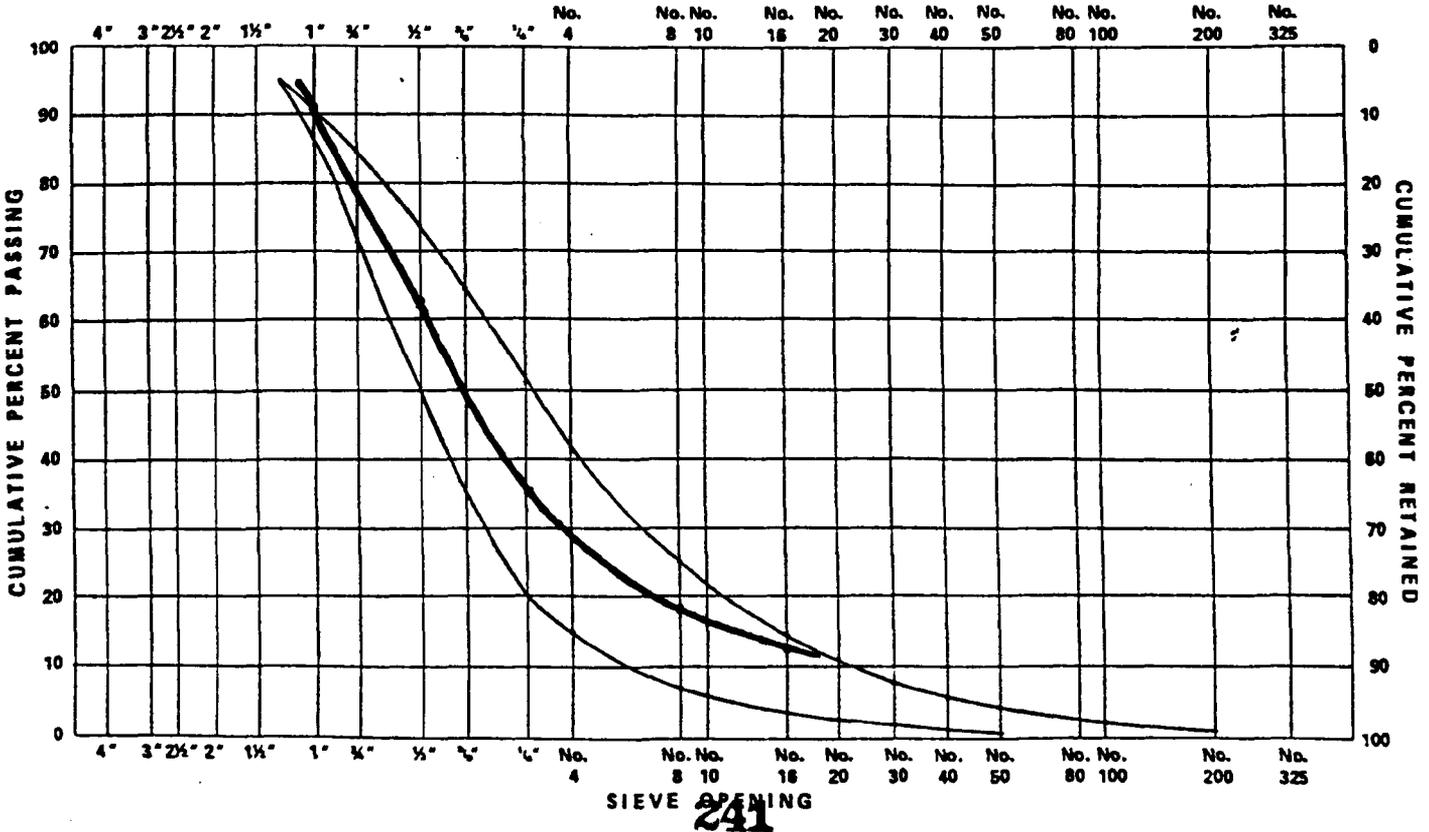
DATE SAMPLE TAKEN Composite

TEST SITE E

TEST PERFORMED BY JOS

SAMPLE IDENTIFICATION Kent

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.7	385.6 647.0	811.2	94	8602.9	100.0	4
1"	↓	608.6 1233.0	2488.0	28.9	7791.7	90.6	4
2"		1049.6 1448.8	2277.0	26.5	5303.7	61.7	4
4"		685.6 971.5	1435.7	16.7	3026.7	35.2	4
#8		641.0	530.3	6.2	1591.0	18.5	4
#16		380.8 901.7	1060.7	12.3	1060.7	12.3	4



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

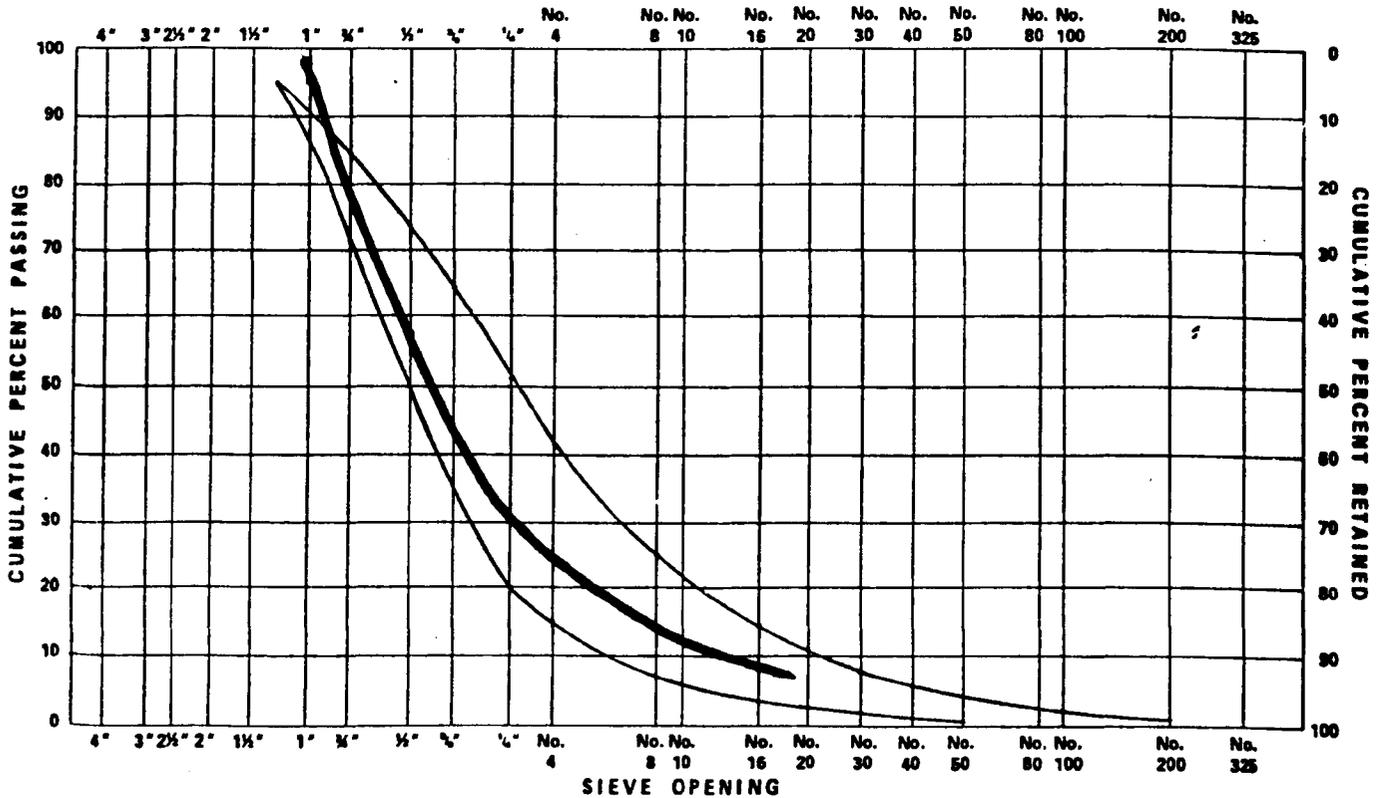
DATE SAMPLE TAKEN 12-20-78

TEST SITE E

TEST PERFORMED BY JLB

SAMPLE IDENTIFICATION Crushed Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.5	206.9 522.6	310.5	4.3	7292.2	100.0	3
1"	↓	1237.6 1798.5	2817.1	38.6	6981.7	95.7	3
3/4"		1021.7 1154.2	1956.9	26.8	4164.6	57.1	3
1/2"		809.7 585.2	1175.9	16.1	2207.7	30.3	3
#8		523.6	414.1	5.7	1031.8	14.2	3
#16		727.2	617.7	8.5	617.7	8.5	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

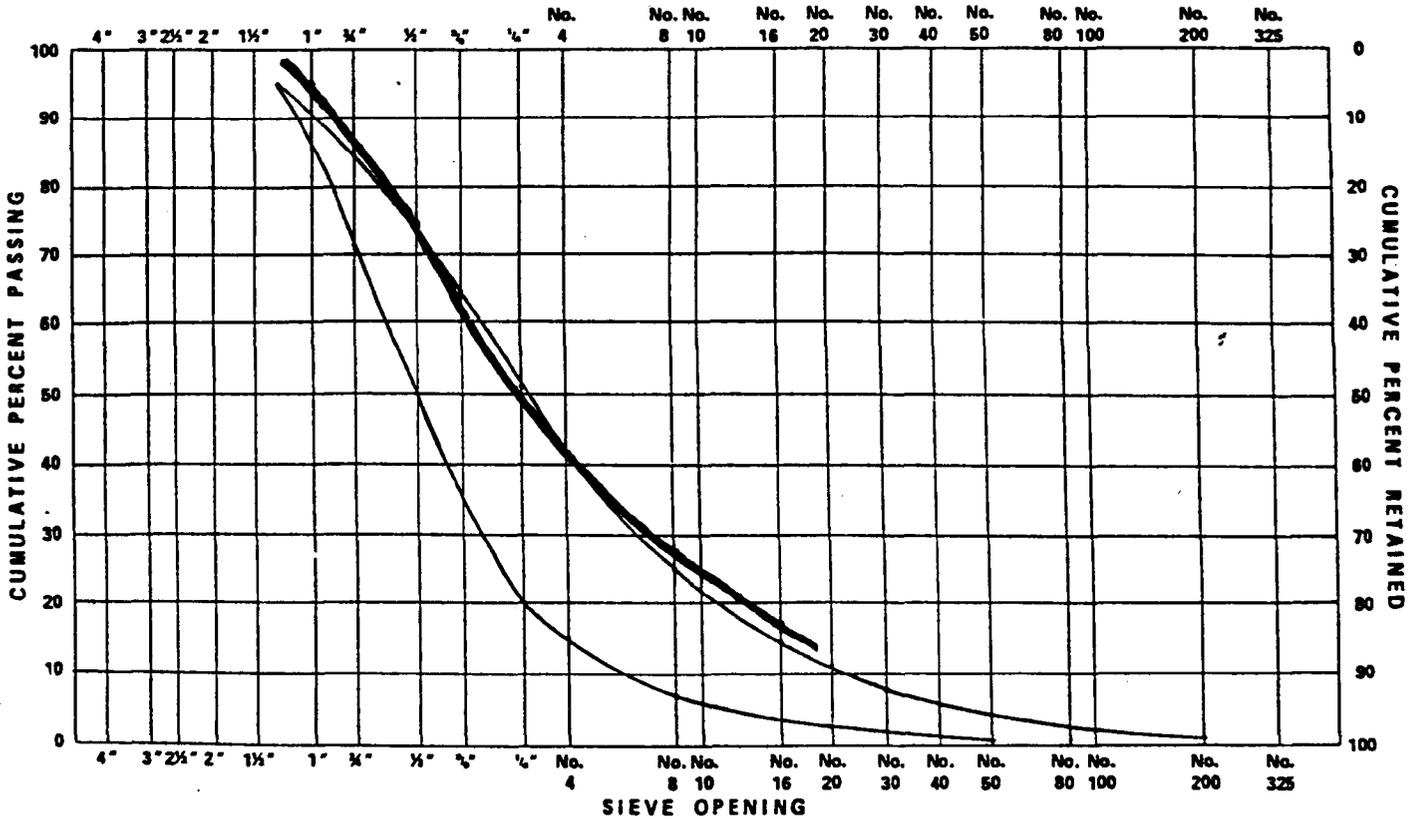
DATE SAMPLE TAKEN 1-8-79

TEST SITE E

TEST PERFORMED BY JOS

SAMPLE IDENTIFICATION Eastern Kentucky

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	891	362.3	273.2	5.1	5338.8	100.0	4
1"	↓	470.5 835.8	1128.1	21.1	5065.6	94.9	4
1/2"		739.4 735.0	1296.2	24.3	3937.5	73.8	4
3/4"		649.0 783.3	1174.1	22.0	2641.3	49.5	4
*8		659.5	570.4	10.7	1467.2	27.5	4
*16		421.7 651.3	896.8	16.8	896.8	16.8	4



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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-600/7-80-064b	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement--Site E (Data Supplement)	5. REPORT DATE April 1980	
	6. PERFORMING ORGANIZATION CODE	
7. AUTHOR(S) J. O. Burlingame, R. A. Parker, W. M. Jackson, and J. D. Demont	8. PERFORMING ORGANIZATION REPORT NO.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS KVB, Inc. 6176 Olson Memorial Highway Minneapolis, Minnesota 55422	10. PROGRAM ELEMENT NO. EHE624	
	11. CONTRACT/GRANT NO. EPA-IAG-D7-E681 and DOE-EF-77-C-01-2609	
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	14. SPONSORING AGENCY CODE EPA/600/13	

15. SUPPLEMENTARY NOTES (*)Cosponsors are DOE and American Boiler Manufacturers Assoc. Project officers are R. Hall (EPA) and W. Harvey Jr. (DOE). The final technical report is EPA-600/7-80-064a.

16. ABSTRACT The Data Supplement is a compilation of test data presented in greater detail than was practical in the final technical report. 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 supplement. The Supplement contains panel board data for each test, detailed particulate, O₂, CO₂, NO, SO₂, and SO₃ data, particle size distribution data, modified smoke spot data, chemical analysis of the coal, and coal size consistency data.

17. KEY WORDS AND DOCUMENT ANALYSIS			
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Air Pollution Boilers Combustion Coal Field Tests Dust Stokers	Improvement Efficiency Flue Gases Fly Ash Particle Size Nitrogen Oxides Sulfur Oxides	Air Pollution Control Stationary Sources Combustion Modification Spreader Stokers Particulate Overfire Air Flyash Reinjection	13B 13A 21B 21D 14B 11G 07B
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	20. SECURITY CLASS (This page) Unclassified	22. PRICE	