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FINAL REPORT

on

COAL CLEANING PREPARATION PLANT EMISSIONS AT WESTMORELAND COAL COMPANY, QUINWOOD, WEST VIRGINIA

to

ENVIRONMENTAL PROTECTION AGENCY

May 14, 1976

by

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COAL CLEANING PREPARATION PLANT EMISSIONS AT WESTMORELAND COAL COMPANY, QUINWOOD, WEST VIRGINIA

by

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INTRODUCTION

In accordance with Section 111 of the Clean Air Act of 1970, the Environmental Protection Agency is charged with the responsibility of developing standards of performance for emissions from new stationary sources (New Source Performance Standards) which may contribute significantly to air pollution. A standard of performance developed under the Act for emissions of air pollutants must be based on the best emission reduction systems that have been adequately demonstrated, taking into account economic considerations.

The development of standards of performance utilizes emissions data for pollutant sources in the particular industry being studied. In response to comments on the proposed emission standards by the coal cleaning industry, the emission control systems (venturi scrubbers) of the Westmoreland Coal Company, Quinwood, West Virginia, were selected by EPA for an emission testing program to provide test data by which the effectiveness of that emission control system could be compared with other facilities previously tested.

The Westmoreland Coal Company contested the proposed standards as a result of their preliminary tests which indicated that their specific type of coal could present an emissions control problem not previously considered by EPA. The Westmoreland data implied that the particle size of the particulate matter entering the venturi scrubber device was finer than had previously been acknowledged. The data indicated that one type of coal (Sewell) processed at the Quinwood plant presented different size characteristics than coal on which the proposed standards were based.

In order to adequately evaluate these allegations, EPA decided to conduct an extensive test program at the Quinwood facility.

Coal delivered to the plant is crushed to a variety of sizes and then washed, screened, and separated by both water and concentration tables. The coal washing occurs in a continuous process which reduces ash content from 16 to 3 percent. The 0 x 3/8-inch size of coal of interest in this study is dewatered by vacuum discs, then dried in a fluidized bed. Coal drying is accomplished by use of flue gas (produced by a coal-fired furnace) reduced in temperature by dilution air. The fluidized bed is contained in a chamber loaded with 40 or more multiclones which separate the coal from the fine dusts. Dust particles pass from the multiclones of the dryer through a high-pressure blower to a venturi scrubber, then to a large mist eliminator, and finally out an 81-inch-diameter stack.

EPA requested Battelle-Columbus to: sample particulate and gaseous emissions from the inlet and outlet stacks of the venturi scrubber control device at the Westmoreland Coal Company, Quinwood, West Virginia. The test program was conducted from June 18, through June 25, 1975 during the times the plant was processing Sewell coal. High mass loading at the inlet required the use of an in-stack Alundum* thimble (in conjunction with an EPA Method 5 train). Tests for particle size distribution of the inlet particulate were made by EPA utilizing a special multilpe-cyclone sampler. Grab samples of the process coal and venturi scrubber water were taken simultaneously with the particulate and gaseous measurements. The purpose of the aforementioned measurements is to provide EPA with additional data for support of their standards development efforts.

In order to evaluate the effect of particle size on the venturi scrubber equipment it was necessary to determine the particle size distribution of the particulate matter entering the scrubber for each type coal. Particle size comparison by sieve analysis was conducted on both types of process coal (Sewell and Pocahontas). Particle sizes of the suspended particulate at the scrubber inlet, suspended particulate in the

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* Mention of trade names does not constitute endorsement or recommendation for use by the Environmental Protection Agency.

scrubber water, and <325 mesh process coal from the sieve analysis were determined by Coulter Counter[1]*. A Mine Safety Appliance Particle Size Analyzer[2] was also used to determine the particle size of the <325 mesh particulate in an effort to substantiate the test results as determined by Coulter Counter. Particle size data, as presented in the figures throughout this report , were determined from one aliquot per sample unless otherwise noted.

Since the effectiveness of the venturi scrubber was in question relative to the process coal particle size, additional effort was placed on determining venturi inlet particulate size distribution. A special EPA series cyclone was used to futher evaluate the size cut of the inlet particles.

Trace metals in Run No. 4 outlet emission samples were determined by optical emission spectroscopy.

Present opacity of the outlet stack emissions was monitored by two certified observers during the particulate sampling. The test program was conducted to determine mass concentration levels and size distributions of particulate emissions during normal plant operation. Process conditions were carefully observed and tests were performed only when the process operations appeared to be operating normally. Process and/or scrubber malfunctions occurred during Runs 2, 3, and 5 at which time the particulate sampling was terminated. Opacity readings continued throughout the entire period including times when high values were observed because of scrubber malfunction.

A total of five outlet and six inlet runs were made for particulate loading. Run No. 1 inlet was voided due to incorrect (Pocahontas) coal being processed. Run No. 2 outlet was not considered valid due to an open circuit in the probe heater and a leak in the filter which allowed some particulate to pass through into the impinger catch. Run No. 3 inlet was voided due to nonrepresentative sampling caused by incorrect placement of the sampling nozzle and, therefore, incorrect sampling point location. Inlet Runs No. 4, 5, and 6 and outlet Runs 3, 4, and 5 were essentially

* References are given on page 65.

simultaneous and considered valid. The following sections of this report cover the summary of results, process description and operation, location of sampling points, and sampling and analytical procedures.

SUMMARY AND DISCUSSION OF SAMPLING RESULTS

Particle Size Results

Process Coal Sieve Results

The effectiveness of a venturi scrubber is, among other factors, related to the particle size of the effluent to be scrubbed. To better understand and evaluate the final outlet emission results of this study it is pertinent to obtain a size distribution of the bulk process coal. Figure 1 graphically depicts the sieve analysis results of two types of coal processed by the Westmoreland Coal Company. (Run No. 1 is probably an unknown composite of both Sewell and Pocahontas types of coal.) The size distributions of the Sewell process coal used during outlet Runs 3, 4, and 5 show very good agreement. As indicated, the Sewell coal has a mass mean diameter of 1000 μm with approximately 3 to 4 percent being less than 325 mesh (44 μm). The Pocahontas coal, as indicated in Figure 1, is relatively smaller than the Sewell coal having a mass mean diameter of 250 μm, but with approximately 4 percent being smaller than 325 mesh. Table 1 is a tabular summary of the Sewell and Pocahontas sieve analysis data.

TABLE 1. SIEVE ANALYSES OF COAL SAMPLES FROM WESTMORELAND COAL COMPANY[a]

Sieve Size		Particle Size Range Collected per Stage, μm	Accumulative Weight-Percent Retained per Stage and Smaller Stages				
U.S. Sieve Number	Screen Opening, μm		Run 1	Run 3	Run 4	Run 5	Pocahontas
4	4,760	>4760	100.0	100.0	100.0	99.9	100.0
8	2,380	2380-4760	90.3	92.9	91.0	91.5	97.8
16	1,190	1190-2380	72.5	75.8	72.4	73.1	92.5
30	590	590-1190	54.0	57.5	53.4	53.9	84.2
50	297	297-590	38.5	41.7	38.2	38.3	72.2
100	149	149-297	25.2	27.9	25.7	25.2	54.9
200	74	74-149	16.7	17.9	17.1	16.4	36.4
325	44	44-74	10.8	11.6	11.3	10.5	21.8
Pan (-325)	<44	<44	3.7	3.1	2.9	3.9	4.0

Note: Run No. 2 discarded
(a) Sample size approximately 900 grams (2 lb)

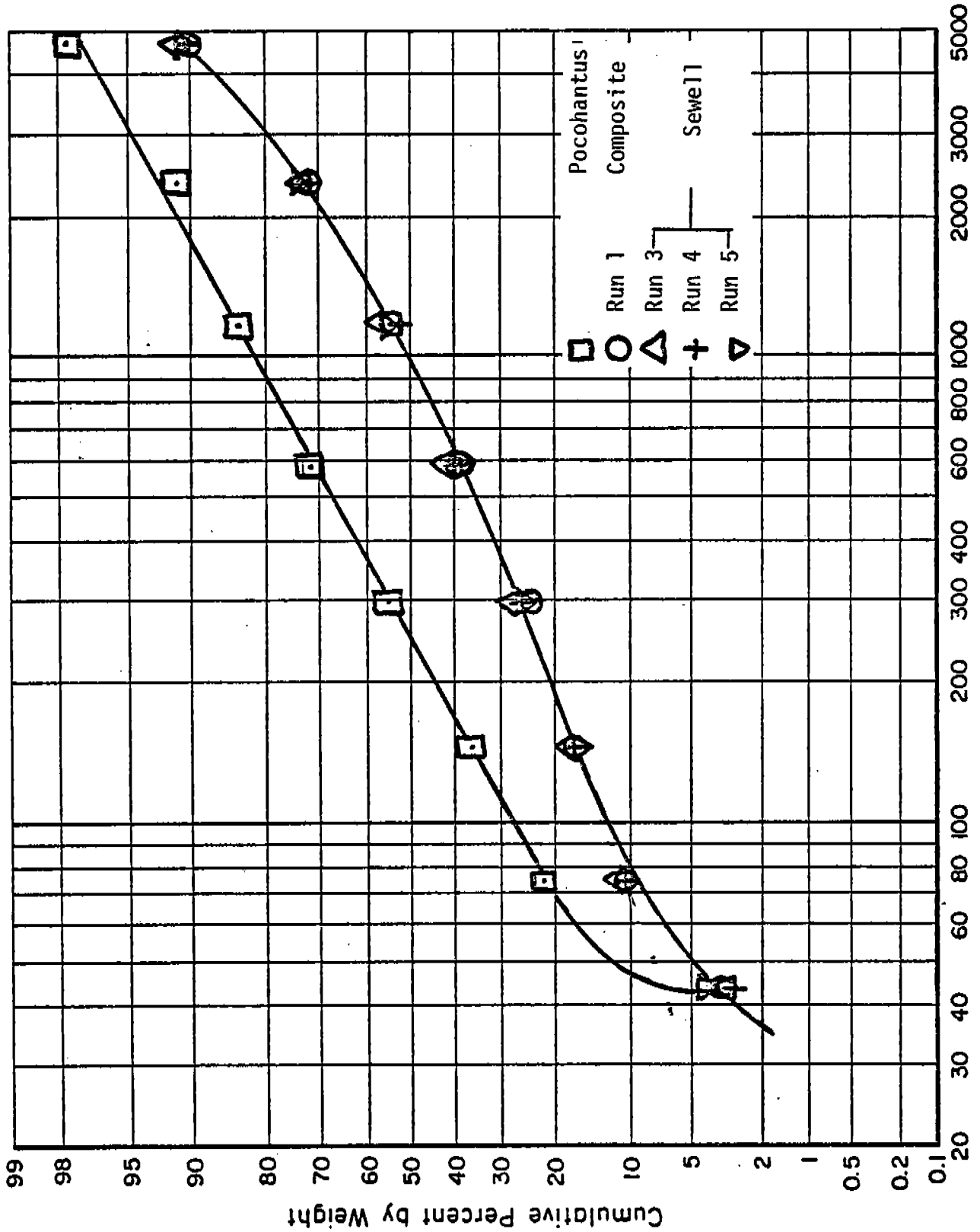


FIGURE 1. PROCESS COAL SIEVE ANALYSIS

In order to evaluate the proportion of ultrafines (<2 μm) that is of primary importance relative to venturi scrubber effectiveness, Coulter Counter analyses of the subsieve fraction (<325 mesh) were performed for the indicated runs. The results are shown in Figure 2. Again the size distribution for the Sewell coal for outlet Runs 3, 4, and 5 show good agreement, the mass mean diameter being approximately 17 μm and approximately 1 to 2 percent being less than 2 μm. The Pocahontas coal has more fines than the Sewell coal, with a mass mean diameter of approximately 12 μm and approximately 2.5 to 3 percent being less than 2 μm. Therefore, with all other factors equal, the Sewell coal emissions are no more difficult to collect with venturi scrubber equipment than the Pocahontas coal emissions.

The Mine Safety Appliance Particle Size Analyzer results as depicted in Figure 3 essentially substantiate the Coulter Counter results for the Sewell samples but shows the Pocahontas and Sewell with essentially an equal size distribution except in the relatively smaller size fractions where scatter in the data occurs. If one averages the MSA data in the smaller size fraction, 2 to 3 percent of the size distribution is less than 2 μm; this agrees with the Coulter Counter data of Figure 2. Table 2 is a tabular summary of the Sewell and Pocahontas results for size measurements with the MSA Particle Size Analyzer.

Particulate Collected by the Scrubber

It is to be expected that the venturi scrubber used to clean particulate from the effluent gas stream will remove large particles more efficiently than smaller particles. To directly measure such effects, mass concentrations and size distributions are required for particles in the gas stream entering the scrubber and in the scrubber water. Because of the time averaging effect of scrubber water recirculation, a direct measurement of particulate mass collected in the water over the inlet gas sampling time was not possible. The scrubber water samples were collected over a very short time interval and, hence, a time averaged value for the particulate collected by the water prior to the sampling time was determined.

TABLE 2. SUBSIEVE PARTICLE SIZE DISTRIBUTION OF WESTMORELAND COAL COMPANY SAMPLES BY MSA PARTICLE SIZE ANALYZER[a]

Particle Size, μm	Weight Percent of <44 μm Portion[b]					Weight Percent of Total Sample[b]				
	Run 1	Run 3	Run 4	Run 5	Pocahontas	Run 1	Run 3	Run 4	Run 5	Pocahontas
60	--	--	--	--	100.0	--	--	--	--	4.00
50	100.0	100.0	100.0	--	97.5	3.70	3.10	2.90	--	3.90
40	98.1	97.6	97.1	100.0	93.7	3.63	3.03	2.82	3.90	3.75
35	97.1	95.3	94.9	97.2	91.2	3.59	2.95	2.75	3.79	3.65
25	79.2	79.2	76.1	78.3	73.3	2.93	2.46	2.21	3.05	2.93
20	63.3	63.4	62.5	65.0	57.5	2.34	1.97	1.81	2.54	2.30
15	43.7	46.7	47.5	48.3	42.9	1.62	1.45	1.38	1.88	1.72
12	33.1	31.9	39.1	38.5	32.9	1.22	0.99	1.13	1.50	1.32
10	26.8	25.8	29.4	30.8	25.0	0.99	0.80	0.85	1.20	1.00
8	18.5	22.5	21.3	21.7	17.1	0.68	0.70	0.62	0.85	0.68
6	12.2	15.5	12.9	14.0	9.6	0.45	0.48	0.37	0.55	0.38
4	5.3	6.4	9.2	8.4	4.6	0.20	0.20	0.27	0.33	0.18
2	1.3	0.7	5.9	4.9	1.3	0.05	0.02	0.17	0.19	0.05
1	0	0	0	0.7	0	0	0	0	0.03	0
0.8	--	--	--	0	--	--	--	--	--	--

Note: Run No. 2 discarded.
(a) Sedimentation liquid--isopropyl alcohol; feed liquid--50 percent isopropyl alcohol, 50 percent heptane.
(b) Data are reported as less than indicated size.

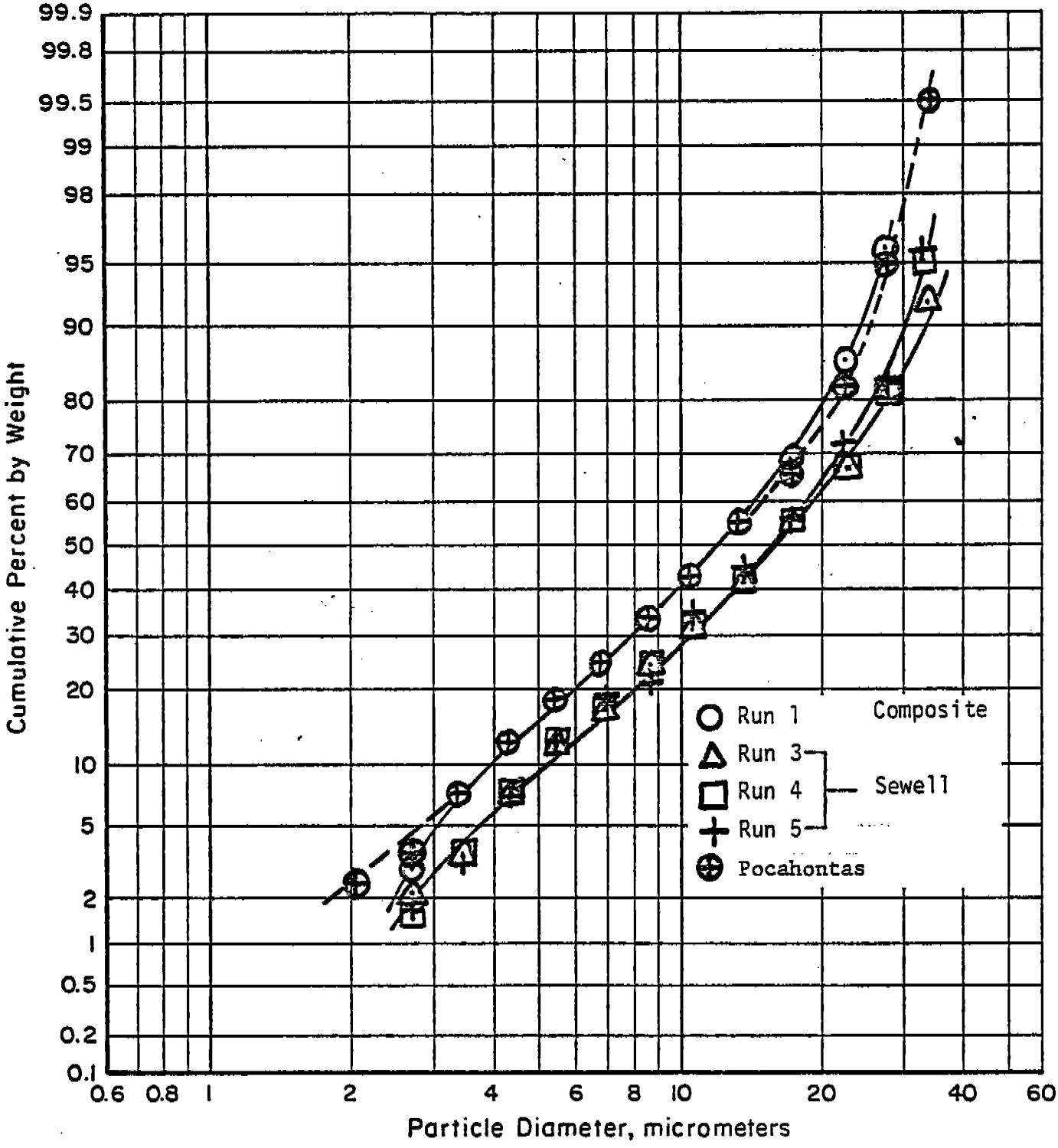


FIGURE 2. SUBSIEVE SIZE DISTRIBUTION OF PROCESS COAL BY COULTER COUNTER

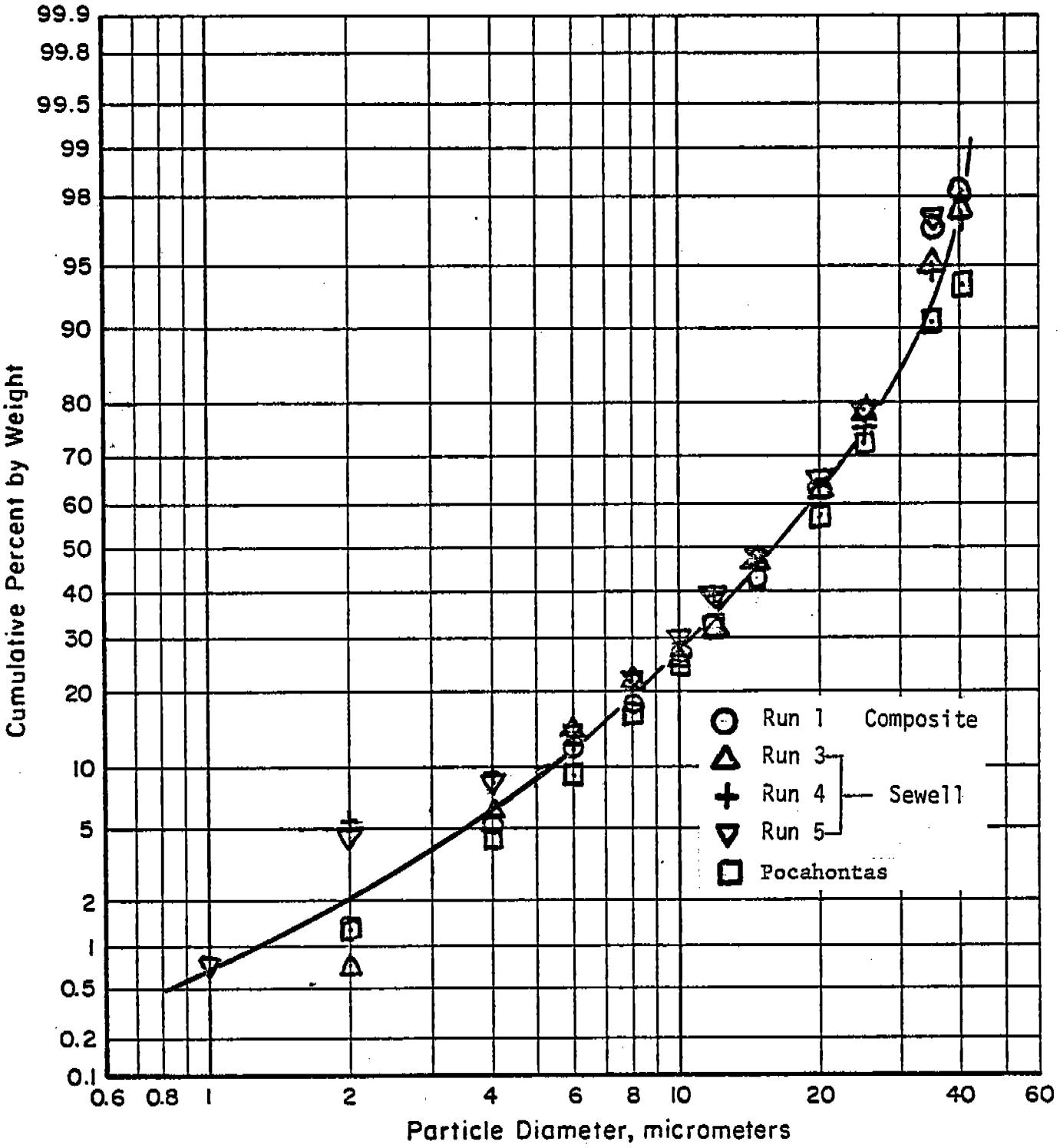


FIGURE 3. SUBSIEVE SIZE DISTRIBUTION OF PROCESS COAL BY MINE SAFETY APPLIANCE PARTICLE SIZE ANALYZER

However, the samples were collected to determine if any differences between inlet suspended particulate and scrubber water particulate existed. These differences could lead to significant inferences regarding scrubber collection efficiency as dependent on particle size.

The size distribution curves given in Figures 4, 5, 6, and 7 allow comparisons between suspended inlet particulate and scrubber collected particulate for Runs 2, 4, 5, and 6, respectively. Inlet Runs 1 and 3 were voided as explained in the Introduction. The results may appear to be inconclusive because of the data in Figures 4 and 5, which show less particulate below about 2 μm in the scrubber water than in the inlet gas, and Figures 6 and 7, which show the reverse. Table 3 is a tabulation of these data. Within the error of the particle sizing methods, the data show that the particle size distribution in the scrubber water is practically the same as the distribution at the scrubber inlet. This result could be predicted when the scrubber collects essentially all of the particulate matter. Data of this type cannot be used to obtain size dependent collection efficiencies. Any major impact on control effectiveness would occur only if a sufficiently large fraction of the particulate material had sizes too small for efficient collection. Size distributions for the suspended inlet particulate indicate that only about 5 percent of the particles have sizes below about 2 μm. This low fraction in the small size range makes comparison impractical since the small sizes constitute a nearly negligible portion of the particulate for measurement purposes. If, however, the differences between the curves are attributable to normal scatter in the experimental data, as is likely, it can be concluded that the overall efficiency is not sensitive to low collection efficiency for these small sizes. This is because such a small fraction of the total entering particles are smaller than the size where efficiency drops off. Therefore, valid conclusions that can be drawn from these data are that the venturi scrubber essentially collects all sizes of particulate in excess of 2 μm. The amount of particulate matter less than 2 micrometers that reduces the scrubber's collection efficiency is not significantly different for Sewell coal as compared with Pocahontas coal.

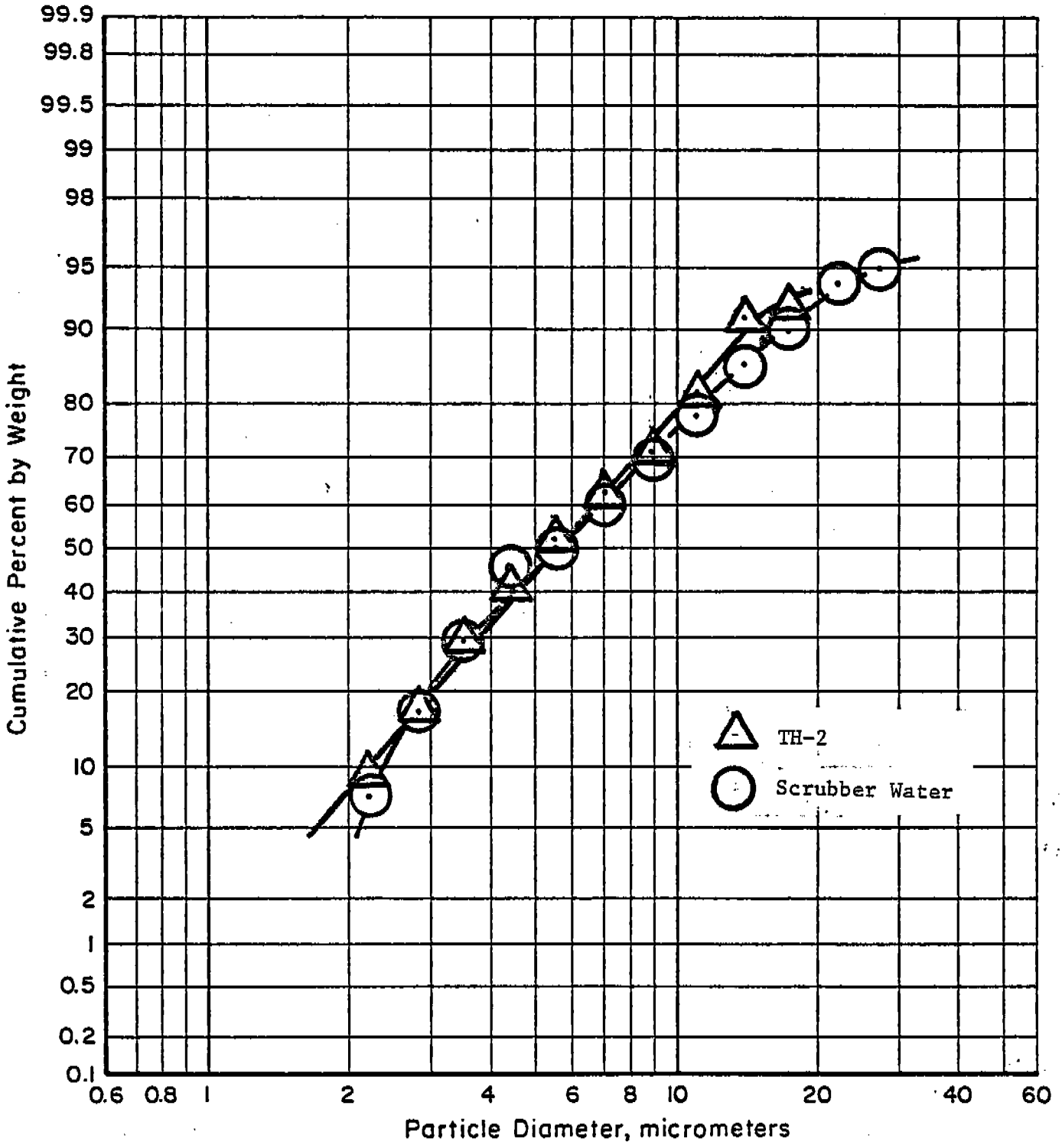


FIGURE 4. COMPARISON OF RUN 2 THIMBLE CATCH AND ASSOCIATED SCRUBBER WATER SUSPENSION, COULTER COUNTER ANALYSES

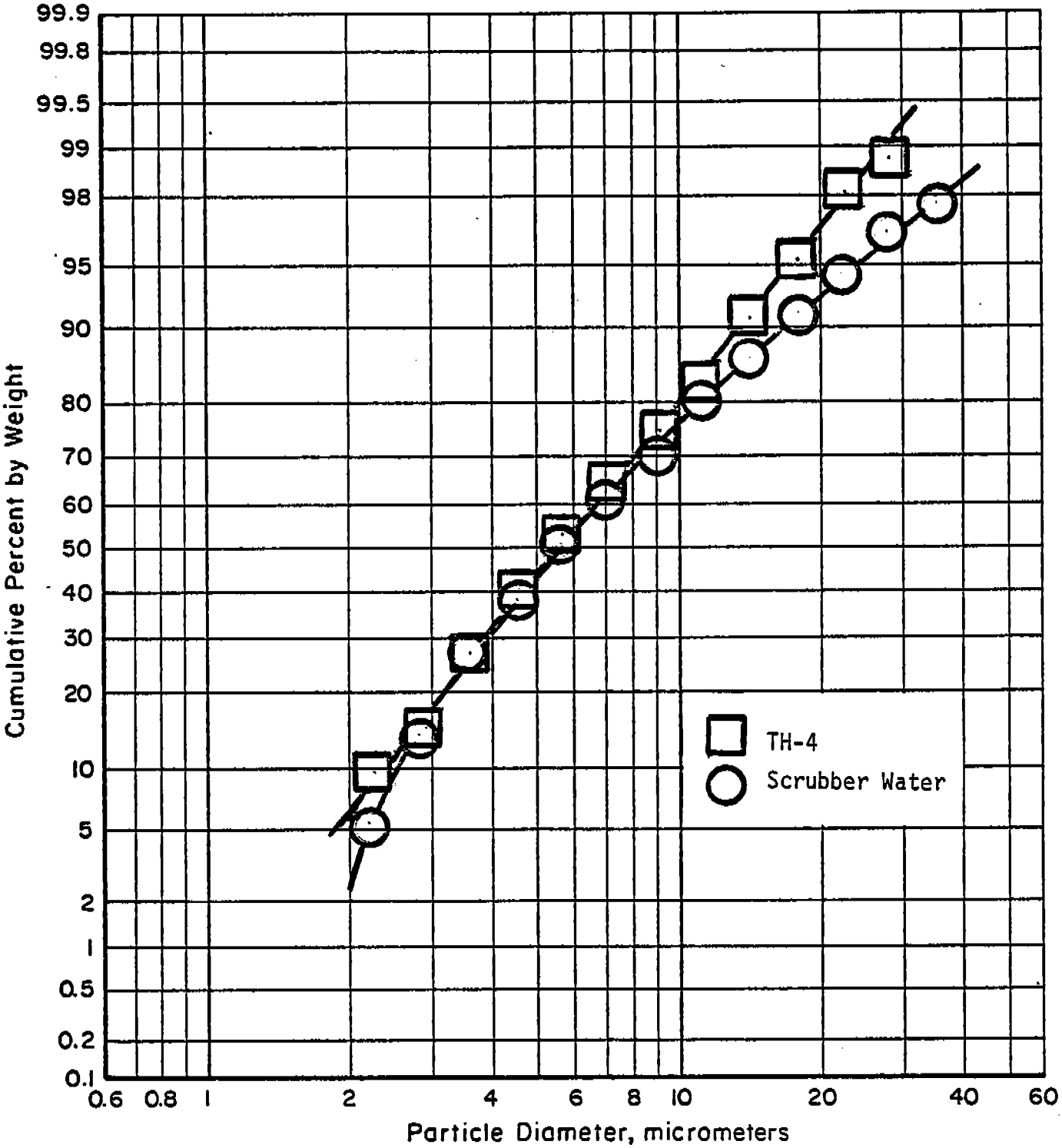


FIGURE 5. COMPARISON OF RUN 4 THIMBLE CATCH AND ASSOCIATED SCRUBBER WATER SUSPENSION, COULTER COUNTER ANALYSES

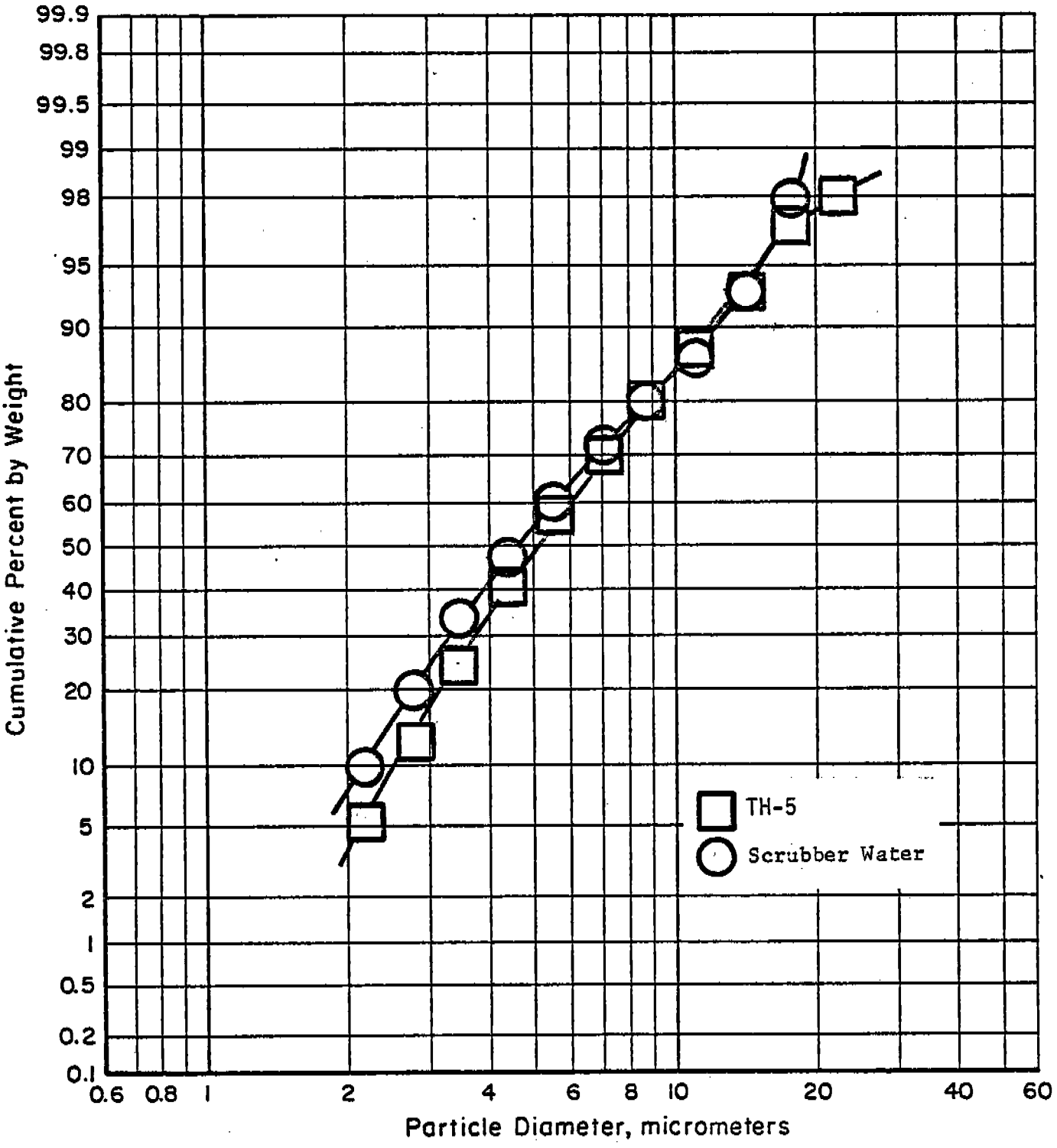


FIGURE 6. COMPARISON OF RUN 5 THIMBLE CATCH AND ASSOCIATED SCRUBBER WATER SUSPENSION, COULTER COUNTER ANALYSES

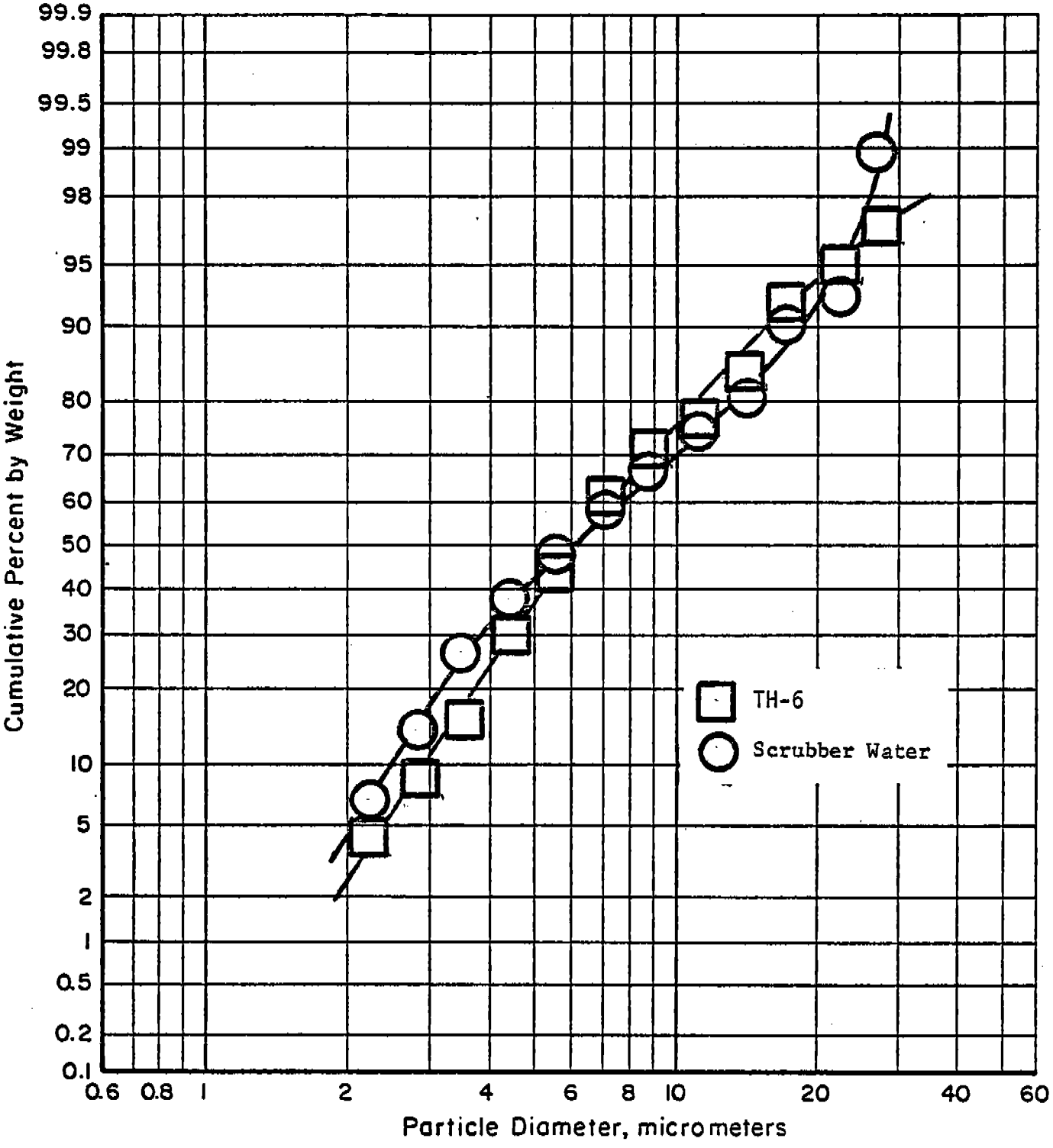


FIGURE 7. COMPARISON OF RUN 6 THIMBLE CATCH AND ASSOCIATED SCRUBBER WATER SUSPENSION, COULTER COUNTER ANALYSES

TABLE 3. SIZE DISTRIBUTION COMPARISON OF PARTICLES ENTERING THE SCRUBBER AND PARTICLES CAUGHT BY THE SCRUBBER WATER[a], FROM WESTMORELAND COAL COMPANY

(Percent less than indicated size)

Particle Size, μm	Run 2		Run 4		Run 5		Run 6	
	Thimble Catch	Scrubber Water	Thimble Catch	Scrubber Water	Thimble Catch	Scrubber Water	Thimble Catch	Scrubber Water
44.2	--	--	--	100.0	--	--	--	--
35.1	--	100.0	100.0	97.88	--	--	100.0	100.0
27.8	--	94.81	98.89	96.82	100.00	--	97.12	98.96
22.1	100.0	94.29	98.34	94.70	98.27	100.00	94.26	93.24
17.5	91.87	89.61	95.43	91.25	97.11	98.33	92.79	90.90
13.9	91.13	85.58	91.20	85.94	92.78	93.13	85.58	81.54
11.1	81.52	78.11	83.37	79.47	86.78	86.47	78.42	74.45
8.8	70.98	70.02	75.48	70.03	79.04	80.63	71.14	67.52
7.0	63.11	60.80	66.11	60.75	69.67	71.78	61.73	58.60
5.5	53.00	50.43	53.83	51.00	57.55	60.53	44.97	48.65
4.4	41.33	46.38	40.70	38.41	40.95	48.15	29.89	38.03
3.5	28.89	29.87	26.95	26.71	24.51	34.07	16.54	27.83
2.8	17.68	17.67	14.82	14.15	12.36	20.47	9.03	14.83
2.2	9.48	7.57	9.53	5.93	5.54	10.02	4.90	7.61

(a) Size distribution of thimble particle catch and scrubber water particle suspension determined by Coulter Counter using an aperture diameter of 100 μm, and a manometer volume of 500 μℓ.

Cyclone Catch Analyses

Tests were conducted using a sample train consisting of two aluminum cyclones followed by a glass fiber filter. The purpose of the tests was to determine the mass loading of particulates less than 2.5 μm in diameter. All tests were conducted at the inlet to the scrubber. The testing cyclones were developed by an independent contractor for the Environmental Protection Agency. Since the equipment had not been previously used by the tester, numerous problems were encountered until a sampling technique was established. A total of 13 runs was conducted. During the first six runs, problems were encountered with the testing; Runs 7-13 were valid tests. However, during Runs 8, 10, and 12, the process was operating under a light load. Furthermore, Run 13 was conducted when Type 7 Sewell surface-mined coal was being processed.

Tables 4 and 5 summarize the test data and analytical data. Table 6 summarizes the test results. The tests were conducted at a nominal flow rate of 1 acfm, yielding cut-off points of 2.5 and 1.0 μm for the first and second cyclones, respectively. Therefore, the particulate less than 2.5-μm diameter was calculated as the total mass minus the mass collected in the first cyclone.

Two tests with a cascade impactor were attempted, but were not successful. In one case, the stages were overloaded, and in the other case, the collection substrates were knocked ajar.

Table 6 summarizes the test results. As previously noted, Tests 7-13 were considered the best tests as far as sampling procedures are concerned. In performing the calculations, an average stack gas moisture (9.9 percent) calculated from the five Alundum thimble runs was used. The results presented in Table 6 show a reasonable correlation between the Alundum thimble and cyclone methods for determining particulate concentration of particles less than 2.5 μm diameter. For cyclone Runs 7-13 the mass percent less than 2.5 μm ranged from 11.6 to 17.6 percent with an average of 14.5 percent. For the Alundum thimble Runs 2, 4, 5, and 6, the mass percent less than 2.5 μm ranged from 7 to 15 percent with an average value of 11.5 percent.

TABLE 4. TEST DATA FOR PARTICLE SIZE RUNS WITH MULTIPLE-CYCLONE SAMPLER

Run Number	Date	Start Time	Port Identification	Sample Period (minutes)	Meter Volume (acf)	Stack Temp. (F)	Nozzle Diameter (inches)	Absolute Stack Pressure (in. Hg)	Volume Sampled (dscf)	Sample Rate (acfm) (a)	Percent Isokinetic
1	6/18	1800	S	22	22.345	190	0.4375	29.68	20.16	1.3	(b)
2	6/19	1415	S	10	8.000	190	0.4375	29.80	7.24	1.0	(b)
3	6/19	1715	S	11	10.520	170	0.4375	29.80	9.52	1.1	(b)
4	6/20	1115	E	11	7.230	170	0.4375	29.80	6.54	0.8	(b)
5	6/20	1445	E	11	9.050	170	0.4375	29.80	8.20	1.0	(b)
6	6/23	1700	E	11	8.675	200	0.1875	29.81	7.84	1.0	(b)
7	6/23	2000	E	11	8.600	200	0.1875	29.81	7.75	0.9	77.8
8	6/25	1005	E	11	8.520	155	0.1875	29.74	7.68	0.9	78.5
9	6/25	1255	E	11	8.525	150	0.1875	29.74	7.68	0.9	78.5
10	6/26	1650	S	11	--	170	0.1875	29.74	--	--	--
11	6/26	1225	S	11	7.895	180	0.1875	29.63	7.08	0.9	85.2
12	6/26	1420	E	11	8.600	180	0.1875	29.63	7.72	1.0	78.1
13	6/26	1550	S	11	8.715	180	0.1875	29.63	7.82	1.0	77.0

(a) Stack conditions.

(b) Used incorrect sample nozzle.

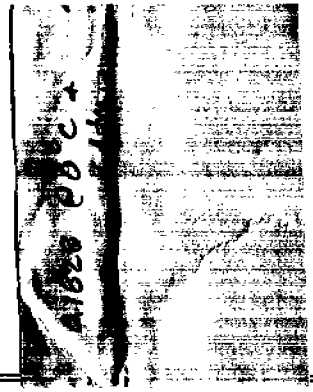


TABLE 5. ANALYTICAL DATA FOR PARTICLE SIZE RUNS WITH MULTIPLE-CYCLONE SAMPLER[a]

Test	First Cyclone	Second Cyclone	Filter	First Cyclone Wash	Second Cyclone Wash	Filter Assembly Wash	First Cyclone Total	Second Cyclone Total	Filter Total	Total
1	--	--	--	--	--	--	--	--	--	--
2	0.3349	N/A	0.0620	N/A	N/A	N/A	0.3349	N/A	0.0620	0.3969
3	1.7575	N/A	0.1144	N/A	N/A	N/A	1.7575	N/A	0.1144	1.8719
4	3.9237	N/A	0.1266	N/A	N/A	N/A	3.9237	N/A	0.1266	4.0503
5	3.6606	2.2320	0.0229	N/A	N/A	0.0085	3.6606	2.2320	0.0314	5.9241
6	1.3006	0.1659	--	N/A	N/A	--	1.3006	0.1659	--	--
7	1.1888	0.1346	0.0450	N/A	N/A	0.0073	1.1888	0.1346	0.0523	1.3757
8 ?	0.5013	0.0535	0.0278	N/A	N/A	0.0048	0.5013	0.0535	0.0326	0.5874
9	1.2658	0.1166	0.0383	0.0060	0.0076	0.0048	1.2718	0.1242	0.0431	1.4391
10 ?	0.6590	0.0752	0.0234	0.0035	0.0062	0.0040	0.6625	0.0814	0.0274	0.7713
11	1.6196	0.2217	0.109	0.0081	0.0089	0.0086	1.6277	0.2306	0.1176	1.9759
12 ?	1.0512	0.1151	0.000	0.0059	0.0172	0.0070	1.0571	0.1323	0.0070	1.1964
13 ?	0.5947	0.0771	0.0386	0.0048	0.0098	0.0028	0.5995	0.0869	0.0414	0.7278

(a) All masses are reported in grams.

N/A Not Applicable.

TABLE 6. SUMMARY OF RESULTS OF PARTICLE SIZE RUNS

Run Number	Mass Loading, gr/scf		*Mass Less than 2.5 μm,[a] percent
	Total	Less than 2.5 μm[a]	
Cyclones:			
1	--	--	--
2	.84	0.14	15.6
3	3.02	0.19	6.1
4	9.54	0.30	3.1
5	11.13	4.25	38.2
6	--	--	--
7	2.73	0.37	13.6
8	1.18	0.17	14.7
9	2.90	0.34	11.6
10	--	--	--
11	4.30	0.76	17.6
12	2.39	0.28	11.6
13	1.43	0.25	17.6
Alundum Thimbles:			
1	2.73	--	--
2	1.79	0.27	15
4	2.89	0.35	12
5	3.23	0.39	12
6	2.67	0.19	7

(a) Total mass, less mass collected in first cyclone.

Figures 8 presents the particle size distribution of the cyclone catches which were analyzed by electronic counter. Field data sheets are presented in Appendix C. Cyclone sample identification and analytical results are presented in Appendix G.

Figure 9 indicates the location of the sampling points. Because of the design of the equipment only the first 22 points on each traverse could be sampled. Each test (Runs 6-13) was conducted using two cyclones in series with a back-up filter. The sampling rate was kept constant during each test at a nominal flow of 1 acfm. Each test was conducted across only one traverse and was only 11 minutes in duration. It was necessary to limit each test to only one traverse because of the capacities of the cyclone collection cups.

Prior to each test the sample train was checked for leaks and then inserted into the stack (with nozzle plugged) in order to allow the cyclones to heat to stack temperature. After a 20-minute pre heat, the cyclones were removed, the nozzle unplugged, the cyclones reinserted, and the test begun.

The sample train was constructed so that the nozzle was inserted directly into the first cyclone. The first cyclone was immediately followed by the second cyclone and a back-up filter connected to the probe. During sampling, both cyclones and filter were in-stack. A flexible hose was used to connect the probe to a silica gel impinger, vacuum pump, and dry gas meter, in that order. Figure H-1 of Appendix H is a block diagram of the cyclone and filter assembly. Figure H-2 shows the calibration curves for the cyclones. Figure H-3 shows the calibration curves for each cyclone and relates the particle cut-off size, μm, as a function of flow rate.

The particulate catch of each cyclone was emptied from the collection cup into a weighing vessel. All residual material was brushed into these vessels using a camel hair brush. In addition, for Runs 9-13, acetone rinses were conducted on the cyclones and filter holder.

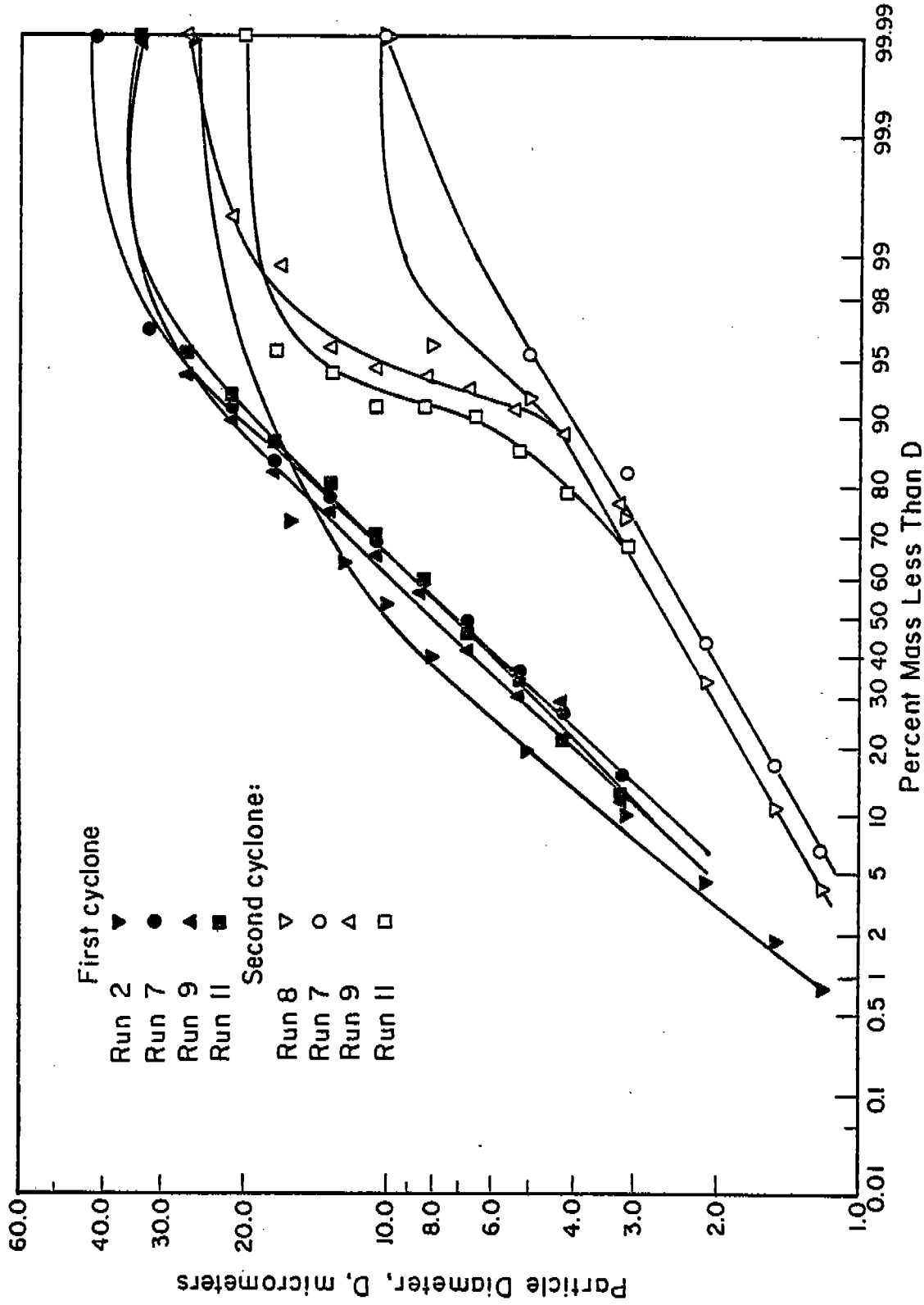
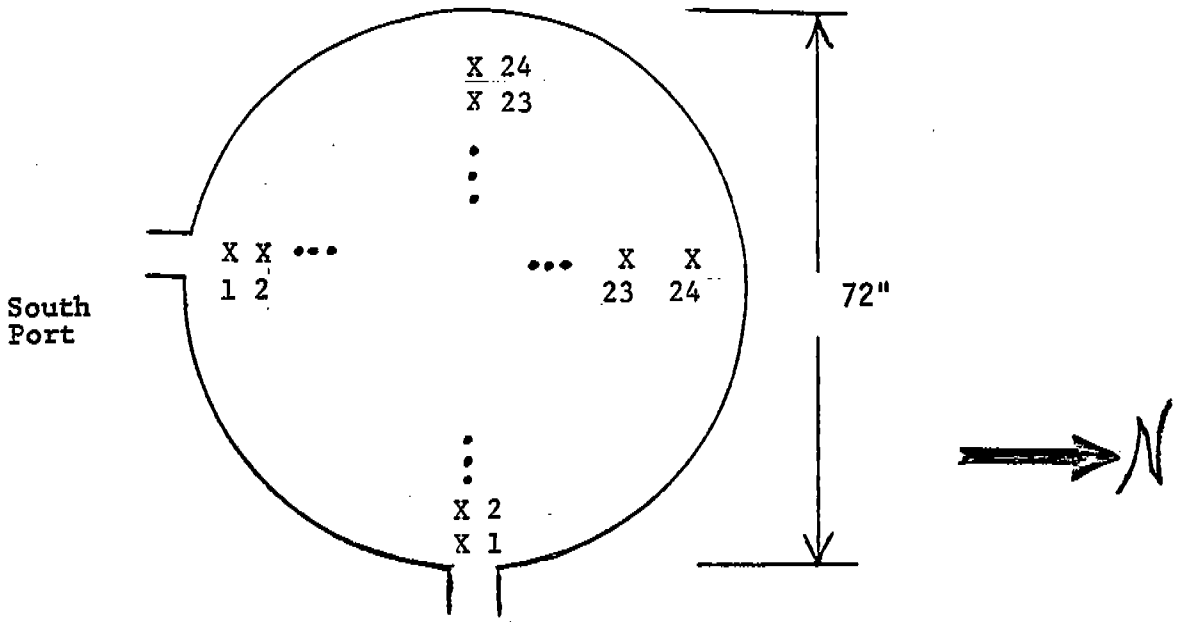


FIGURE 8. PARTICLE SIZE DISTRIBUTIONS OF CYCLONE CATCHES, COULTER COUNTER ANALYSES



Traverse points:

1	1 inch	13	43.25
2	2.25	14	48.75
3	4	15	52.5
4	5.75	16	55.5
5	7.5	17	58
6	9.5	18	60.5
7	11.5	19	62.5
8	14	20	64.5
9	16.5	21	66.25
10	19.5	22	68
11	23.25	*23	69.75
12	28.75	*24	71

*Not Sampled.

FIGURE 9. SAMPLE POINT LOCATION

For several cyclone catches, the particle size distribution of the collected material was determined using an electronic counter. The sizing procedures used were the same as those employed for the Alundum thimble particulate catches.

Scrubber Inlet Measurement Results

Tables 7 and 8 show computer output tabular summaries (in English and metric units, respectively) of results of Runs 1 through 6, Run 3 being aborted because of operator error. Runs 1 and 2 are not considered representative relative to outlet comparison but are being presented only as support data to aid in ascertaining a better understanding of inlet sampling conditions. Weight concentration for Runs 4, 5, and 6 ranged from 2.68 to 3.23 gr/dscf (6144 to 7407 mg/Nm^3) resulting in a mean of 2.93 gr/dscf (6728 mg/Nm^3). Isokinetic sampling for Runs 4 to 6 varied from 100 to 106 percent, in spite of the undesirable working conditions encountered, which is well within the desired limits of 100 ± 10 percent for producing valid data.

Scrubber Outlet Results

Tables 9 and 10 show summarized data by computer (in English and metric units, respectively) obtained at the outlet stack of the Westmoreland Coal Company. Runs 1 and 2, as previously mentioned, are not considered representative because of plant and/or BCL operator error, but have been presented as additional support data.

For Runs 3 to 5, the dry catch (probe and filter) weight concentration results are 0.037, 0.059, and 0.035 gr/dscf (86.1, 134.5, and 80.6 mg/Nm^3 , respectively. The impinger catch results for Runs 3 to 5 increased the weight concentrations an average of 25 percent, the total catch (probe, filter, and impingers) being 0.054, 0.072, and 0.049 gr/dscf (123.2, 164.6, and 112.9 mg/Nm^3), respectively.

TABLE 7. INLET MEASUREMENT RESULTS SUMMARY (ENGLISH UNITS)

WESTMORELAND COAL COMPANY INLET RESULTS

RUN NO.[a]	1	2	4	5	6	Average[e]
TEST DATE	6/18	6/19	6/20	6/23	6/25	
VOLUME OF GAS SAMPLED, DSCF[b]	118.3	88.8	90.4	140.0	126.6	119.0
PERCENT MOISTURE BY VOLUME	11.2	7.8	9.1	10.7	12.1	10.6
AVERAGE STACK TEMPERATURE, F	166	164	171	202	181	185
STACK VOLUMETRIC FLOW RATE, DSCFM[c]	136913	148680	144041	138019	135899	137986
STACK VOLUMETRIC FLOW RATE, ACFM[d]	183212	191155	190094	193875	188004	190657
PERCENT ISOKINETIC	98.6	94.6	100.0	106.1	99.7	101.9
PERCENT EXCESS AIR	1072	1786	2411	2267	1595	2091
PERCENT OPACITY	NA	NA	NA	NA	NA	NA
FEED RATE, TONS/HR	ND	ND	ND	ND	ND	ND
PARTICULATES - PROBE,CYC,FILTER CATCH						
MG	18144.0	9271.0	15368.0	26167.0	20087.0	20540.0
GR/DSCF -	2.729	1.785	2.888	3.225	2.675	2.929
GR/ACF -	2.038	1.387	2.187	2.294	1.932	2.138
LB/HR -	3201.3	2273.3	3564.1	3812.9	3114.2	3497
LB/TON FEED	ND	ND	ND	ND	ND	ND

ND - No Data

NA - Not Applicable

(a) Run No. 3 aborted.
(b) Dry standard cubic feet at 70° F, 29.92 in. Hg.
(c) Dry standard cubic feet per minute at 70° F, 29.92 in. Hg.
(d) Actual cubic feet per minute.
(e) Average includes only Runs 4, 5, and 6.

TABLE 8. INLET MEASUREMENT RESULTS SUMMARY (METRIC UNITS)

WESTMORELAND COAL COMPANY INLET RESULTS

RUN NO. / TEST DATE	1 6/18	2 6/19	4 6/20	5 6/23	6 6/25	Average
VOLUME OF GAS SAMPLED, NCM (a)	3.3	2.5	2.6	3.9	3.6	3.4
PERCENT MOISTURE BY VOLUME	11.2	7.0	9.1	10.7	12.1	10.6
AVERAGE STACK TEMPERATURE, C	74	73	77	94	82	84
STACK VOLUMETRIC FLOW RATE, NCMM (b)	3862	4194	4063	3893	3833	3930
STACK VOLUMETRIC FLOW RATE, CMM (c)	5168	5392	5362	5469	5303	5378
PERCENT ISOKINETIC	98.6	94.6	100.0	106.1	99.7	101.9
PERCENT EXCESS AIR	1072	1786	2411	2267	1595	2091
PERCENT OPACITY	NA	NA	NA	NA	NA	NA
FEED RATE, MTON/HR	ND	ND	ND	ND	ND	ND
PARTICULATES - PROBE,CYC,FILTER CATCH						
MG	18144.0	9271.0	15368.0	26167.0	20087.0	20540
MG/NCM -	6269.3	4099.4	6634.4	7407.2	6144.3	6728.6
MG/CM -	4688.7	3185.7	5022.5	5268.2	4437.2	4909.3
KG/HR -	1452.1	1031.2	1616.7	1729.5	1412.6	1586.3
KG/MTON FEED	ND	ND	ND	ND	ND	ND

ND - No Data.

(a) Normal cubic meter (dry) 20.0 C, 760 mm Hg.
(b) Normal cubic meter per minute (dry) at 20.0 C, 760 mm Hg.
(c) Actual cubic meters per minute.

NA = Not Applicable

TABLE 9. OUTLET MEASUREMENT SUMMARY RESULTS (ENGLISH UNITS)

WESTMORELAND COAL COMPANY OUTLET RESULTS						
RUN NO. TEST DATE	1 6/18	2 6/19	3 6/20	4 6/23	5 6/25	Average[d]
VOLUME OF GAS SAMPLED, DSCF[b]	109.5	100.5	106.7	109.2	104.0	106.6
PERCENT MOISTURE BY VOLUME	11.8	11.4	11.4	13.2	11.9	12.2
AVERAGE STACK TEMPERATURE, F	113	105	110	116	112	113.3
STACK VOLUMETRIC FLOW RATE, DSCFM[c]	132543	125534	139320	135983	137815	137629
STACK VOLUMETRIC FLOW RATE, ACFM[d]	175923	163761	182820	184172	182949	183457
PERCENT ISOKINETIC	106.4	103.3	100.6	103.8	97.1	100.6
PERCENT EXCESS AIR	1072	1786	2411	2267	1595	2091
PERCENT OPACITY	15[e]	20	25	13	20	19
FEED RATE, TONS/HR	ND	ND	ND	ND	ND	ND
PARTICULATES - PROBE,CYC,FILTER CATCH						
MG	244.4	328.1	239.6	376.9	214.2	276.9
GR/DSCF -	0.038	0.055	0.037	0.059	0.035	0.044
GR/ACF -			0.029	0.043	0.026	0.033
LB/HR -			44.7	68.2	41.4	51.4
LB/TON FEED			ND	ND	ND	ND
PARTICULATES - TOTAL CATCH						
MG			342.9	461.4	300.2	368.2
GR/DSCF -			0.054	0.072	0.044	0.058
GR/ACF -	0.035	0.058	0.041	0.053	0.037	0.044
LB/HR -	52.9	81.5	64.0	83.5	58.0	68.5
LB/TON FEED	ND	ND	ND	ND	ND	ND
PERCENT IMPINGER CATCH	18.5	26.8	30.1	18.3	28.5	25.7

ND - No Data.

(a) Dry standard cubic feet at 70° F, 29.92 in. Hg.
(b) Dry standard cubic feet per minute at 70° F, 29.92 in. Hg.
(c) Actual cubic feet per minute.
(d) Average includes only Runs 3, 4, and 5.
(e) Opacity measured only during portion of run.

TABLE 10. OUTLET MEASUREMENT RESULTS SUMMARY (METRIC UNITS)

WESTMORELAND COAL COMPANY OUTLET RESULTS						
RUN NO. / TEST DATE	1 6/18	2 6/19	3 6/20	4 6/23	5 6/25	Average
VOLUME OF GAS SAMPLED, NCM (a)	3.1	2.8	3.0	3.1	2.9	3.0
PERCENT MOISTURE BY VOLUME	11.8	11.4	11.4	13.2	11.9	12.2
AVERAGE STACK TEMPERATURE, C	45	41	43	46	44	44
STACK VOLUMETRIC FLOW RATE, NCMM (b)	3739	3541	3930	3836	3887	3884
STACK VOLUMETRIC FLOW RATE, CMM (c)	4962	4619	5157	5195	5161	5171
PERCENT ISOKINETIC	106.4	103.3	100.6	103.8	97.1	100.6
PERCENT EXCESS AIR	1072	1786	2411	2267	1595	2091
PERCENT OPACITY	15	20	25	13	20	19
FEED RATE, MTON/HR	ND	ND	ND	ND	ND	ND
PARTICULATES - PROBE,CYC,FILTER CATCH						
MG	244.4	328.1	239.5	376.9	214.2	276.9
MG/NCM -	87.3	127.4	86.1	134.5	80.6	100.4
MG/CM -	65.7	97.5	65.5	99.2	60.6	75.1
KG/HR -	19.6	27.1	20.3	30.9	18.8	23.3
KG/MTON FEED	ND	ND	ND	ND	ND	ND
PARTICULATES - TOTAL CATCH						
MG	299.7	448.2	342.9	461.4	300.2	368.2
MG/NCM -	107.1	174.1	123.2	164.6	112.9	133.6
MG/CM -	80.6	133.3	93.8	121.4	85.0	100.1
KG/HR -	24.0	37.0	29.0	37.9	26.3	31.1
KG/MTON FEED	ND	ND	ND	ND	ND	ND
PERCENT IMPINGER CATCH	18.5	26.8	30.1	18.3	28.6	

ND - No Data.

(a) Normal cubic meter (dry) at 20.0 C, 760 mm Hg.
(b) Normal cubic meters per minute (dry) at 20.0 C, 760 mm Hg.
(c) Actual cubic meters per minute.

Inlet and outlet volumetric flow rates compare reasonably well when considering the relatively poor inlet sampling location. Insufficient downstream stack diameters from the inlet sampling location did not allow sufficient time to establish a uniform flow profile; the end result being a poor velocity profile which could be a reasonable explanation for the inlet and outlet volumetric flow rate difference.

Moisture condensation in the outlet stack and reentrainment of water droplets resulted in the effluent gases being supersaturated and, thus, the stack gas moisture content of the gases was greater than the moisture corresponding to the dew point.

Complete particulate results by computer, which include additional operational data, and sample calculations for outlet Run No. 4 can be seen in Appendix A.

Total Solids in Scrubber Outlet Water

Solids in the scrubber water samples were determined by passing a 50-ml aliquot of the scrubber water through a tared 45-mm glass fiber filter. The sample was then dried to a constant weight. Table 11 shows the results for the indicated runs.

TABLE 11. SCRUBBER WATER ANALYSIS

Outlet Run No.	Total Solids, percent
2	7.64
3	8.69
4	7.74
5	6.94

Opacity Measurements

Visible emissions were observed by two BCL certified smoke readers simultaneous with particulate sampling. During the five runs, opacity values ranged from 10-30 percent. Particulate sampling was terminated during periods of time when the venturi scrubber was malfuntioning. Opacity readings for the most part were taken during all periods. A complete summary of the data is presented in Appendix B-1 and B-2. Tables 12 and 13 are computer summaries of Appendices B-1 and B-2 and list the frequency each observer exceeded the stated opacities.

In order to make it easier to interpret this large amount of data a graphic presentation of each run has been prepared and is presented in Figures 11 through 15. Each graph shows the percent opacity as a function of time of day for the total reading period for each test. Runs 3 and 5 have been divided into A and B sections because of relatively long interruptions in opacity observations and also to facilitiate computer data reduction. Also shown on the graphs, by means of horizontal arrows, are the time periods during which "Particulate Sampling" occurred. These graphs make it possible to quickly determine the ranges of visible emissions during particulate sampling times for each of the five test runs. Because opacity readings were continued when scrubber malfunctions occurred, abnormal values of visible emissions may have been observed. Emphasis should be placed only on the visible emission data obtained during particulate sampling. Figure 11 shows the relative positions of the observation sites with respect to the outlet stack and adjacent structures. Site B was used for opacity reading in the mornings and Site A in the afternoons.

TABLE 12. FREQUENCY OBSERVATION AVERAGES EXCEEDING STATED OPACITY FOR PARTICULATE SAMPLING ONLY

Run No. 1

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:	PLCHR	SNYDR
30%	0	0
25%	0	0
20%	0	2
15%	3	5
10%	6	7
5%	7	7
0%	7	7

Run No. 2

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:	PLCHR	SNYDR
30%	3	5
25%	5	10
20%	8	14
15%	17	20
10%	22	22
5%	22	22
0%	22	22

Run No. 3A

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:	PLCHR	SNYDR
30%	10	0
25%	14	3
20%	17	17
15%	18	19
10%	18	20
5%	18	20
0%	18	20

Run No. 3B

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:	PLCHR	SNYDR
30%	0	0
25%	0	0
20%	0	3
15%	5	4
10%	5	4
5%	5	4
0%	5	4

Run No. 4

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:	PLCHR	SNYDR
30%	0	0
25%	0	0
20%	0	1
15%	5	7
10%	21	20
5%	21	22
0%	21	22

Run No. 5A

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:	PLCHR	SNYDR
30%	0	0
25%	0	0
20%	0	1
15%	0	4
10%	8	10
5%	8	10
0%	8	10

Run No. 5B

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:	PLCHR	SNYDR
30%	0	0
25%	1	5
20%	6	11
15%	9	13
10%	10	13
5%	10	13
0%	10	13

TABLE 13. FREQUENCY OBSERVATION AVERAGES EXCEEDING STATED OPACITY FOR TOTAL OPACITY DATA

Run No. 1

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:

	PLCHR	SNYDR
30%	0	0
25%	0	0
20%	0	2
15%	3	5
10%	6	7
5%	7	7
0%	7	7

Run No. 2

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:

	PLCHR	SNYDR
30%	2	6
25%	6	11
20%	9	17
15%	22	24
10%	27	26
5%	27	26
0%	27	26

Run No. 3A

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:

	PLCHR	SNYDR
30%	11	0
25%	15	4
20%	23	19
15%	25	27
10%	25	26
5%	27	29
0%	27	29

Run No. 3B

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:

	PLCHR	SNYDR
30%	0	0
25%	0	0
20%	0	5
15%	4	11
10%	11	12
5%	11	12
0%	11	12

Run No. 4

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:

	PLCHR	SNYDR
30%	3	0
25%	3	0
20%	3	2
15%	4	9
10%	19	23
5%	34	35
0%	35	35

Run No. 5A

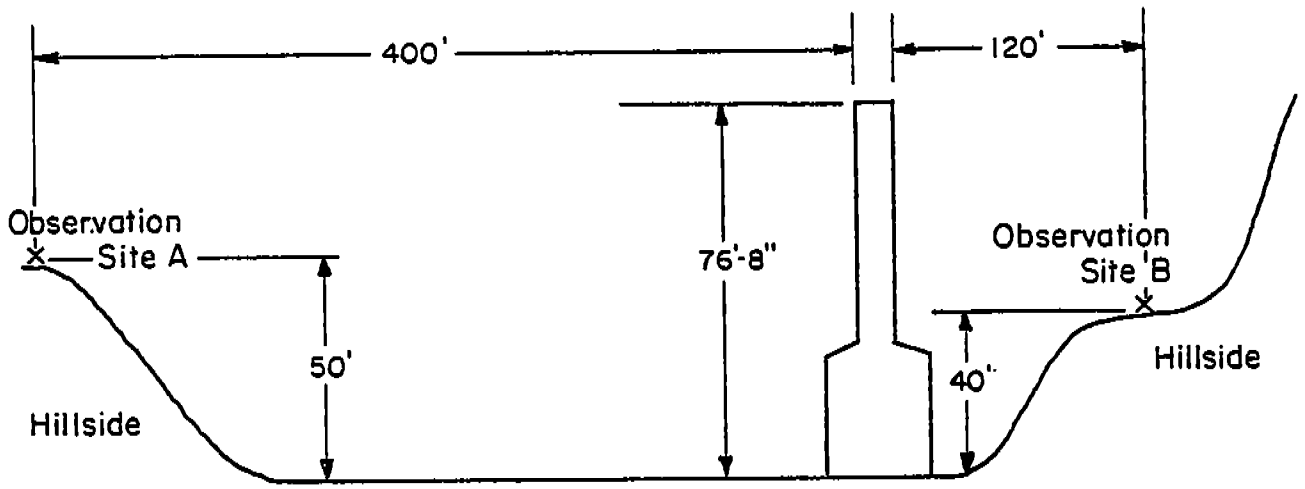
FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:

	PLCHR	SNYDR
30%	0	1
25%	2	5
20%	14	25
15%	25	28
10%	29	30
5%	29	30
0%	29	30

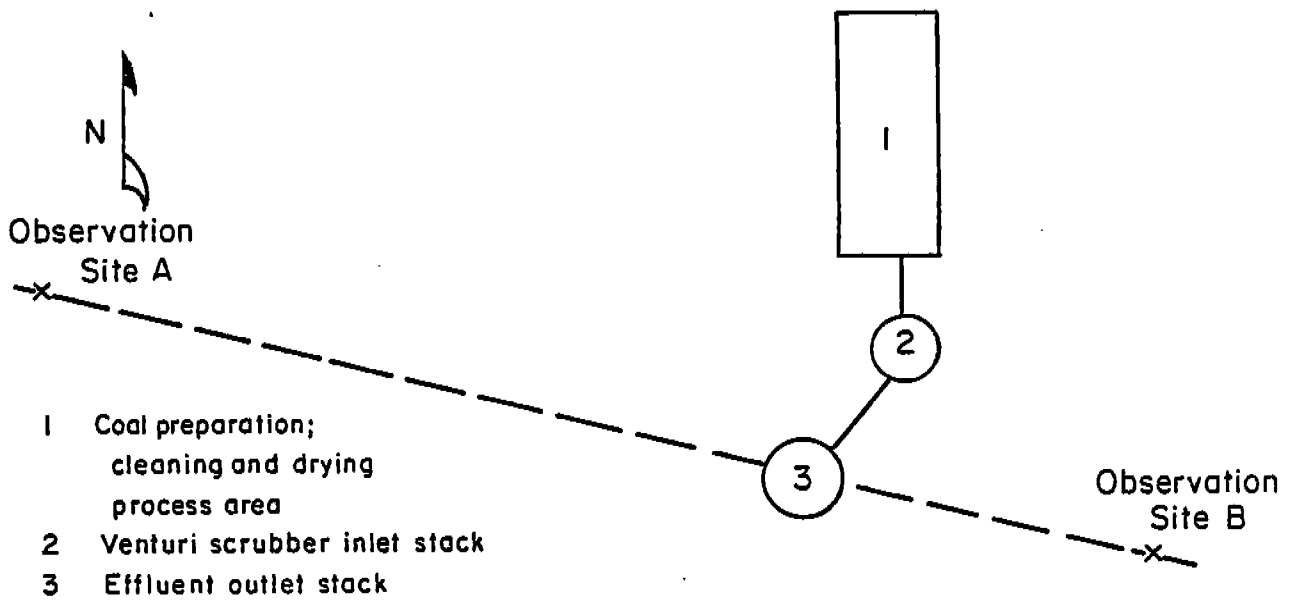
Run No. 5B

FREQUENCY OBSERVER AVERAGE EXCEEDS STATED OPACITY:

	PLCHR	SNYDR
30%	2	2
25%	3	2
20%	4	4
15%	6	7
10%	15	14
5%	15	14
0%	15	14



Cross-Sectional View



Top View

FIGURE 10. OPACITY OBSERVATION SITES

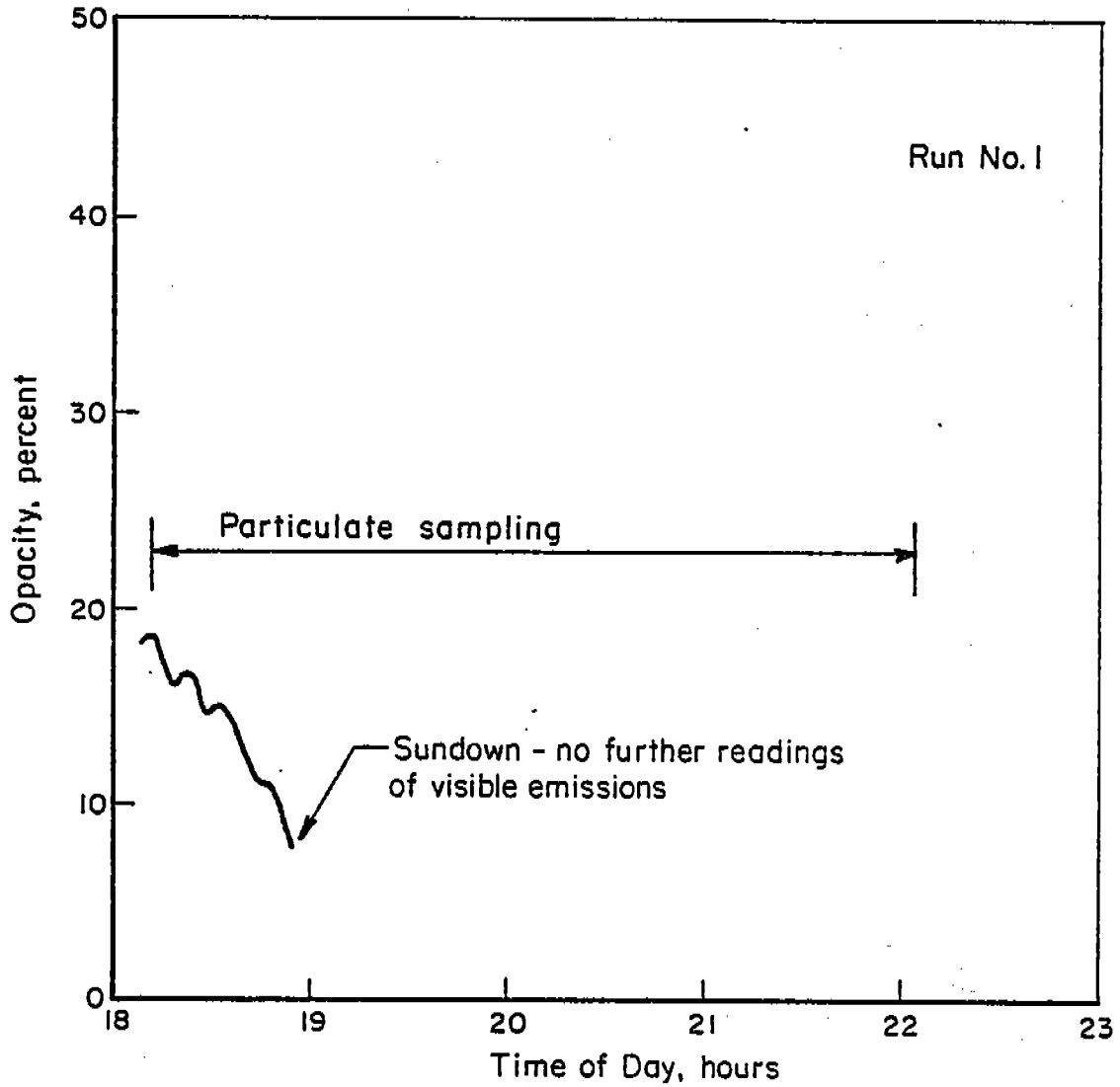


FIGURE 11. RUN NO. 1 OPACITY RESULTS AS A FUNCTION OF TIME OF DAY

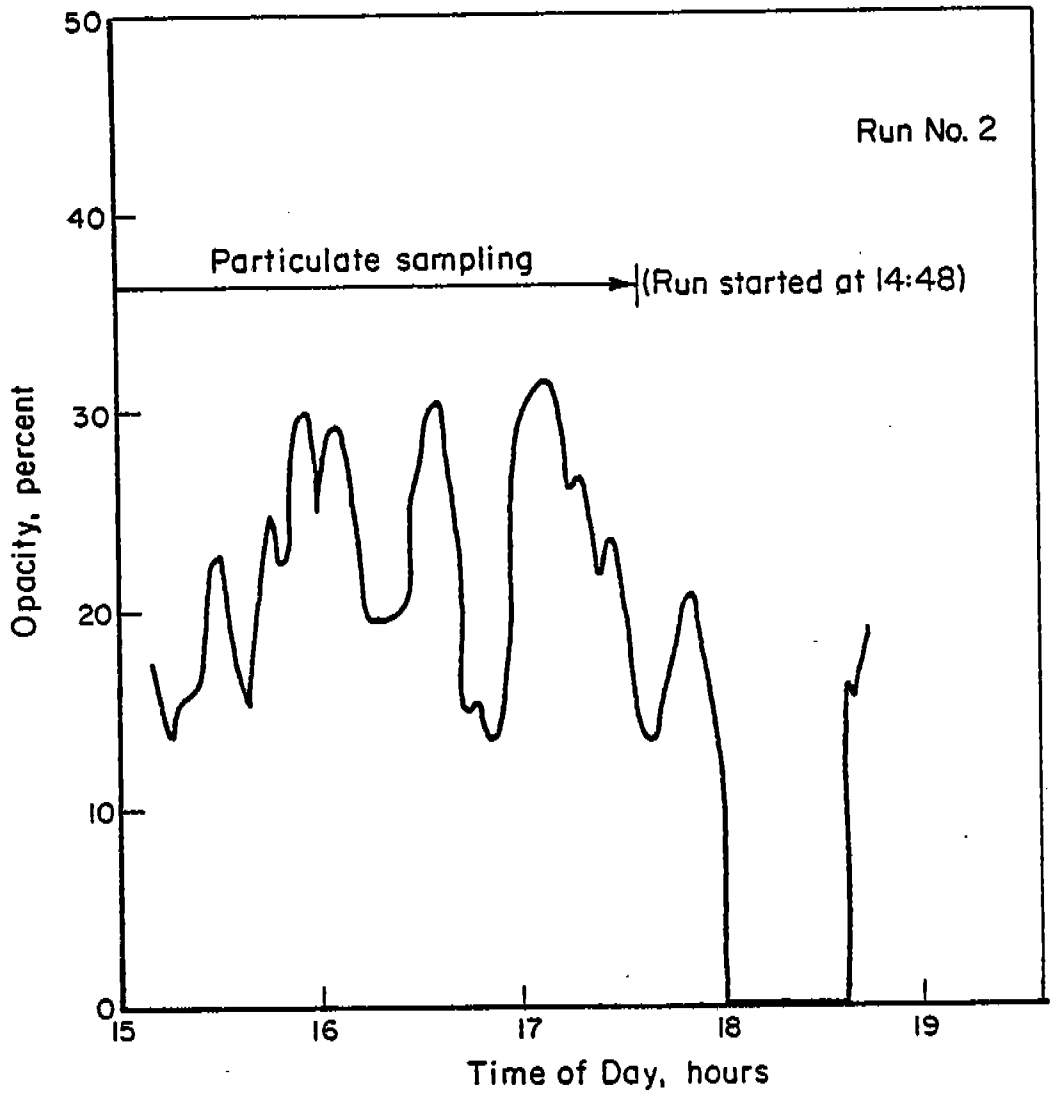


FIGURE 12. RUN NO. 2 OPACITY RESULTS AS A FUNCTION OF TIME OF DAY

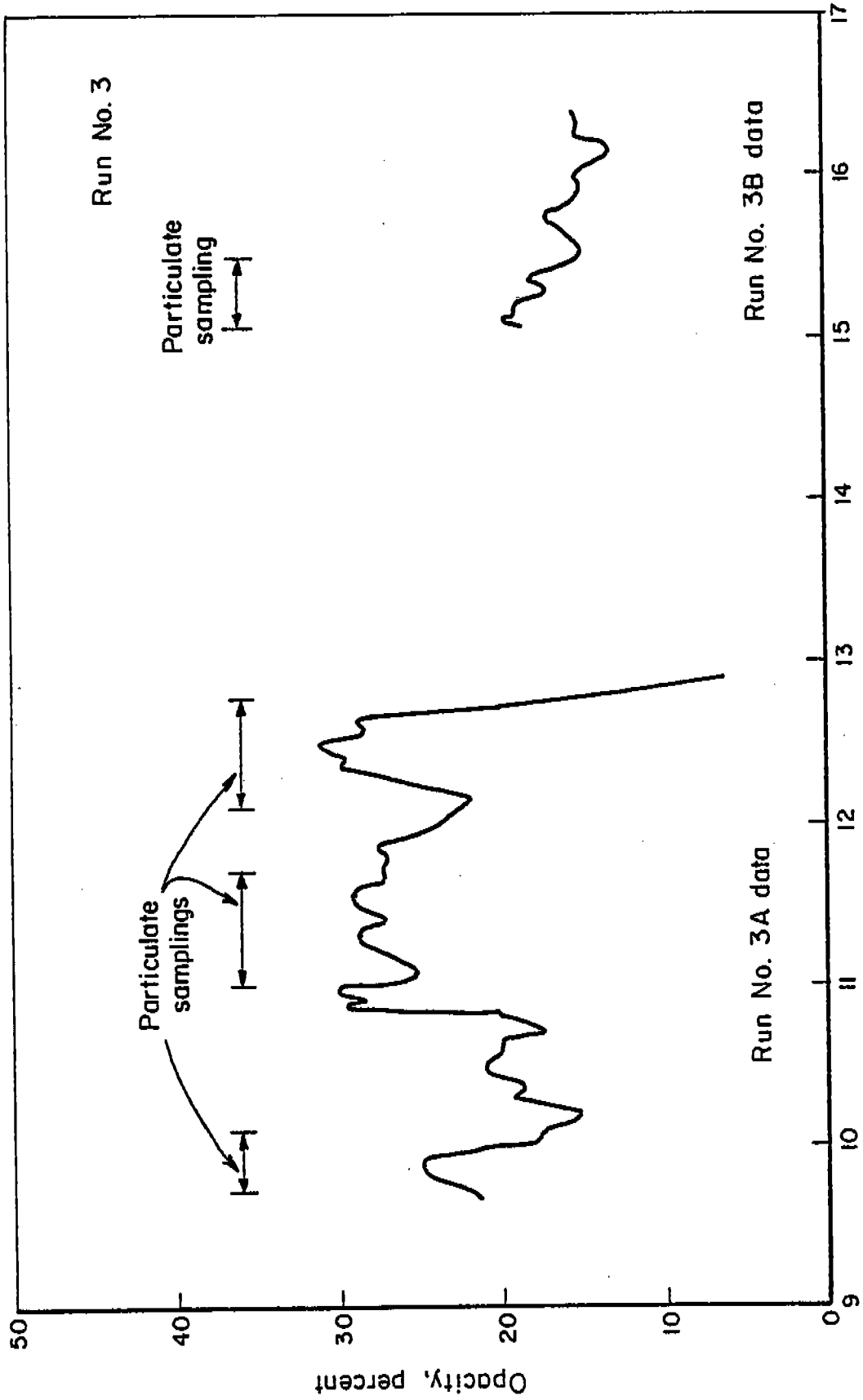


FIGURE 13. RUN NO. 3 OPACITY RESULTS AS A FUNCTION OF TIME OF DAY

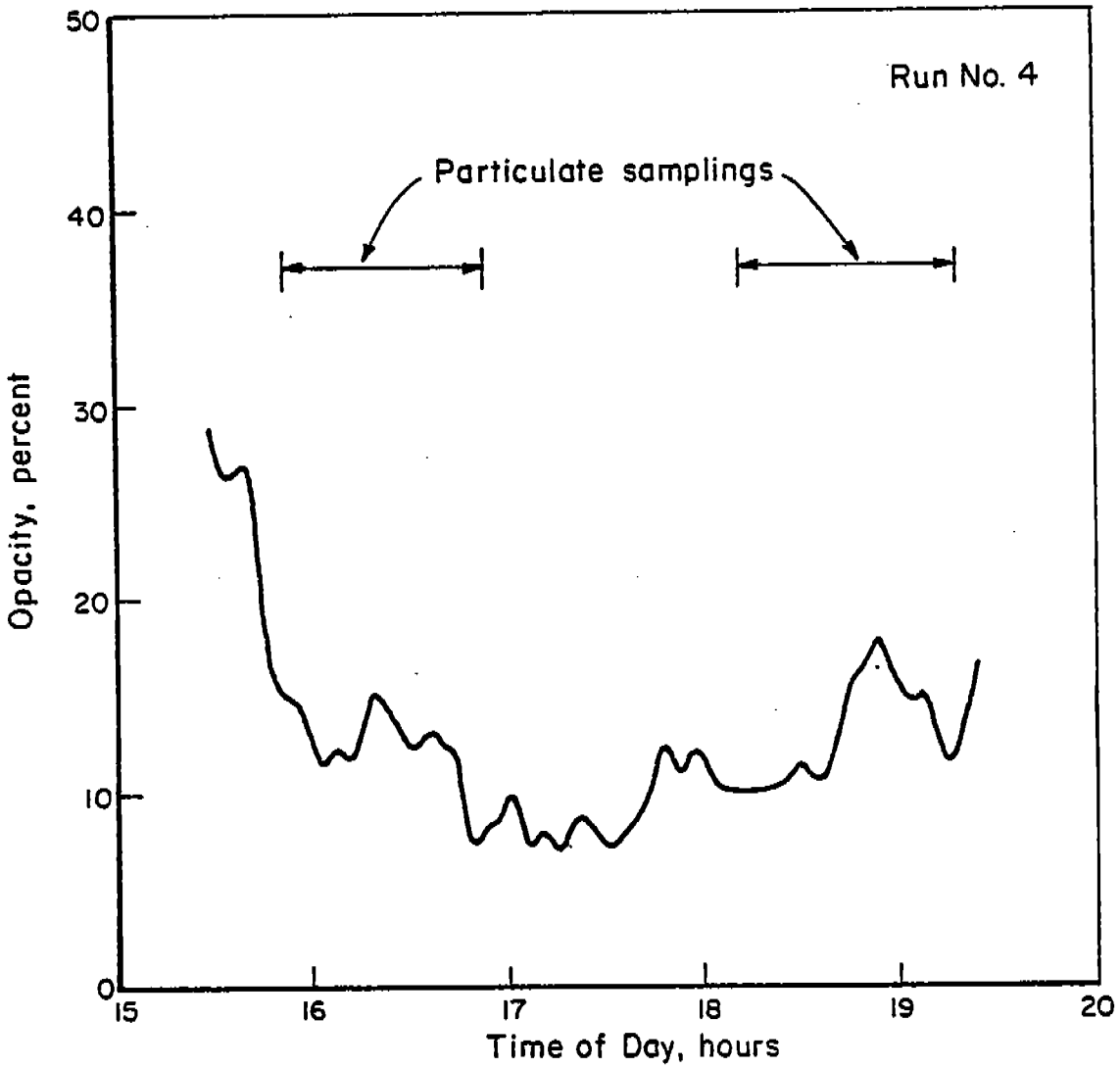


FIGURE 14. RUN NO. 4 OPACITY RESULTS AS A FUNCTION OF TIME OF DAY

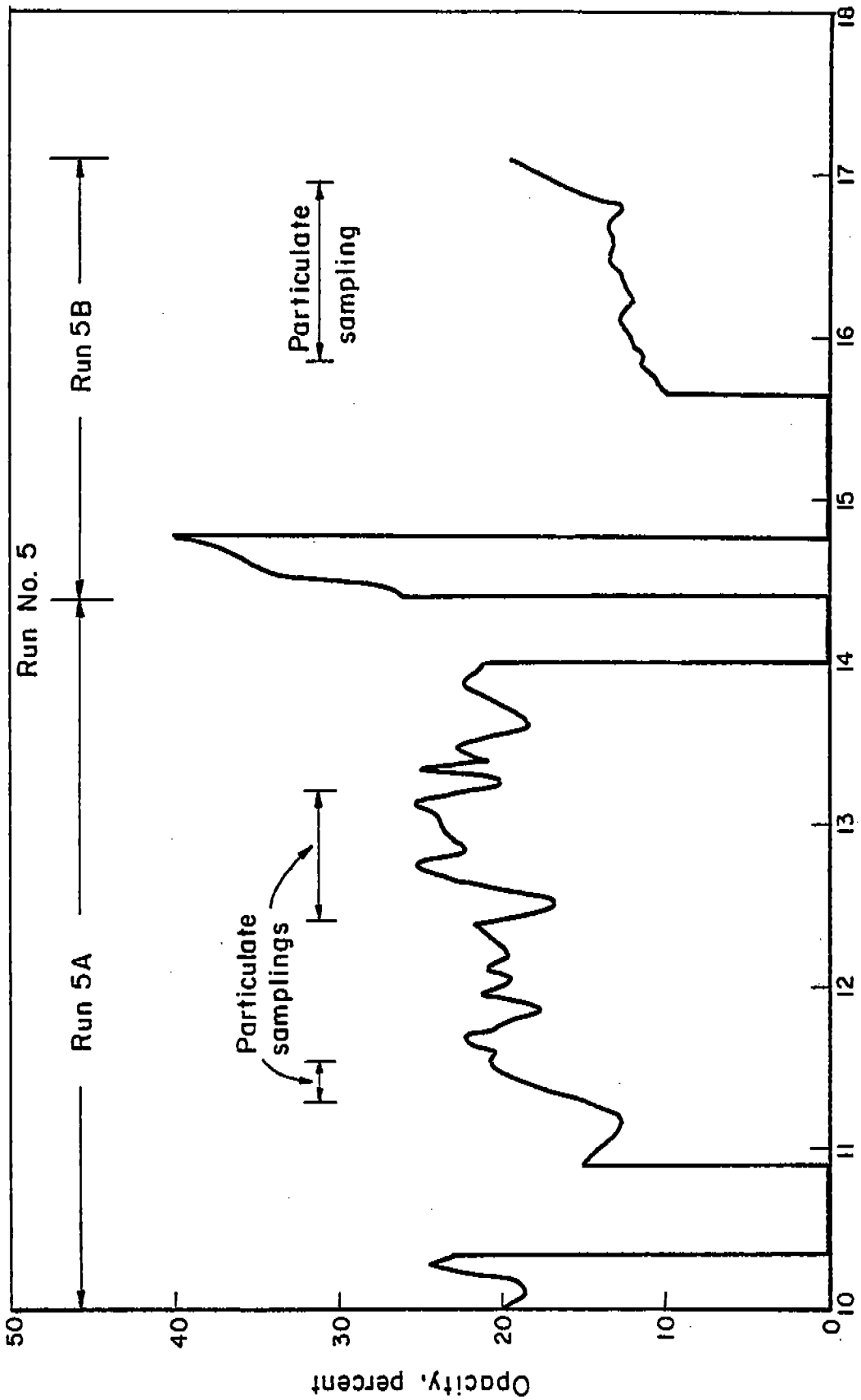


FIGURE 15. RUN NO. 5 OPACITY RESULTS AS A FUNCTION OF TIME OF DAY

Data Applicable to All Five Runs

The following data, required by the EPA "Guidelines for Preparing Summary of Visible Emissions", apply to all five of the test runs.

Type of Plant: Coal cleaning

Type of Discharge: Emissions from thermal dryer

Location of Discharge: Stack above dryer

Height of Point of Discharge: 76 feet, 8 inches above ground level

Distance from Observer to Discharge Point:

Site A: 400 ft northwest of stack
Site B: 120 ft southeast of stack

Height of Observation Point:

Site A: 50 ft above base of stack
Site B: 40 ft above base of stack

Direction of Observer from Discharge Point:

Site A: northwest of stack (in afternoon)
Site B: southeast of stack (in morning)

The remaining data called for in the EPA guidelines are different for each run and are presented in Table 14. An examination of Figures 11 through 15 show the opacity ranges as follows.

Test Run 1 - Opacity ranged from about 8 to 18 percent during the 50 minutes of observations prior to sundown.

Test Run 2 - Opacity ranged from about 14 to 31 percent during time of particulate sampling which extended from 1448 to 1736 hours.

Test Run 3A - Opacity ranged from 22 to 31 percent.

Test Run 3B - Opacity ranged from 15 to 20 percent.

Test Run 4 - Opacity ranged from about 7 to 18 percent during the times of particulate sampling which were 1552 to 1655 hours and 1811 to 1917 hours.

Test Run 5A - Opacity ranged from about 17 to 25 percent during the first two particulate sampling periods.

Test Run 5B - Opacity ranged about 12 percent at the start of the third particulate sampling period.

TABLE 14. OPACITY OBSERVATION SUMMARY

Run No.	Date (1975)	24 Hr. Clock Time	Observation Site	Description of Background	Description of Sky	Wind Direction	Wind Velocity, mph	Color of Plume	Comments	Duration of Observation
1	1/18/75	1809-1859	A	Sky	20% clouds	from NNW	0-5	Black with steam plume near stack	Black plume obscured by attached steam plume sometimes extending 200 ft above stack	50 min; discontinued at sundown (7:00 p.m.)
2	6/19/75	1510-1850	A	Sky	50% clouds	from SW	5-10	Black with steam plume near stack	Black plume obscured by attached steam plume up to 75 ft above stack	3 hrs, 40 min
3A	6/20/75	0940-1300	B	Sky	Overcast (100% clouds)	from NE	0-5	Black with steam plume attached to stack	Black plume obscured by attached steam plume extending 100 to 200 ft above stack	3 hrs, 20 min
3B	6/20/75	1504-1628	A	Sky	Overcast (100% clouds)	from NE	0-5	Black with steam plume attached to stack	Black plume obscured by attached steam plume extending 50 to 100 ft above stack	1 hr, 24 min
4	6/23/75	1530-1930	A	Sky	Overcast (100% Clouds)	from NW but variable	0-5	Black with steam plume attached to stack	Black plume obscured by attached steam plume extending 75 to 250 ft above stack	4 hrs
5A	6/25/75	1004-1400	B[(a)]	Sky	Slightly overcast (10% clouds)	from NE	0-5	Black with steam plume attached to stack	Steam plume extended 50 to 125 ft above stack	3 hrs, 56 min
5B	6/25/75	1430-1715	A	Sky	Slightly overcast (10% clouds)	from NE	0-5	Black with steam plume attached to stack	Steam plume extended 50 to 125 ft above stack	2 hrs, 45 min

(a) Moved to Site A at 1310 hours.

Trace Metal Results

The catch from Run No. 4 was analyzed for trace metals and the results are shown in Table 15. For the most part these data are considered to be representative of what one might expect from coal. The results must be interpreted with consideration of mass for each sample. The ppm values, as presented, tend to be misleading if one does not relate the indicated ppm values to the associated sample mass (as presented at the bottom of the table) to obtain the mass per sample of each element. The major constituents based on the mass collected on probe and filter catch are iron, potassium, sodium, and zinc. Relatively small amounts of other elemental constituents were picked up in the acetone rinse of the impingers but are insignificant when considering their relative mass. Silicon, being the predominant metal, is most likely present due to its occurrence in coal ash. However, some portion of the silicon may represent fragments of filter picked up during the probe-and-filter-holder acetone rinse.

LOCATION OF SAMPLING POINTS

Inlet to Venturi Scrubber

Particulate samples were collected from the scrubber inlet gases using an Alundum thimble in conjunction with a standard EPA Method 5 rig. A rather large port consisting of a 6-inch-diameter nipple was necessary to accept the special EPA series cyclone used to classify particle size. The cyclone had an overall height of 5-1/2 inches. Due to the high pressure drop across the scrubber (30 inches water pressure), it was necessary to fabricate a sealed holding chamber and sliding gate valve assembly (Figure 16) so that the sampling probe could be inserted into the stack against the high static pressure. The relatively large holding chamber would not allow complete traversing of one stack diameter

TABLE 15. OPTICAL EMISSION SPECTROSCOPY ANALYSIS FOR TRACE METALS (RUN NO. 4), PPM

Element	Samples(a,b) -441(1)	-441(2)	-442	-443	-444	-445
Hg	--	--	--	--	--	--
Be	1	1	<1	<1	<1	<1
Cd	<200	<200	<200	<10	<170	<285
As	<200	<200	<200	<10	<170	<285
V	30	30	30	<3	<60	<95
Mn	10	10	200	<3	10	70
Ni	50	50	100	<3	<60	190
Sb	<50	<50	<50	<10	<170	<285
Cr	50	50	300	<3	<60	95
Zn	1,000	1,000	300	<20	600	950
Cu	300	300	50	<3	<60	1,900
Pb	50	50	<20	40	120	190
Se	--	--	---	--	--	--
B	100	200	200	<3	170	280
F	--	--	--	--	--	--
Li	<600	<600	<600	<25	<570	<950
Ag	<1	<1	150	10	30	50
Sn	10	10	<10	115	570	1,900
Fe	3,000	3,000	6,000	<3	400	570
Sr	50	20	100	10	<15	70
Na	2,000	2,000	2,000	115	570	2,900
K	3,000	3,000	2,000	45	860	2,400
Ca	500	500	1,000	370	<60	1,900
Si	--	--	15,000	100	1,700	1,900
Mg	300	300	600	45	<60	1,600
Ba	50	50	100	3	60	285

(a) Descriptions of Sample Nos. S75-001-441 through -445 and Blank Nos. -493 through -496 are as follows:

		Wt (Solid), mg	Vol (Liquid), ml
-441	Glass fiber filters (2 each)	54.3/54.1	--
-442	Acetone, wash of front half	268.8	160
-443	Impinger catch and water rinse	87.0	815
-444	Chloroform/ether extraction	3.5	150
-445	Final acetone rinse of back half	2.1	325
-493	Glass fiber filter (3 each)	0	--
-494	Acetone blank, Burdick and Jackson Lot #7150	0.4	200
-495	Demineralized double distilled water, OSU	1.6	200
-496	Chloroform/ether, Baker A.R.	1.9	150

(b) Background Subtracted.

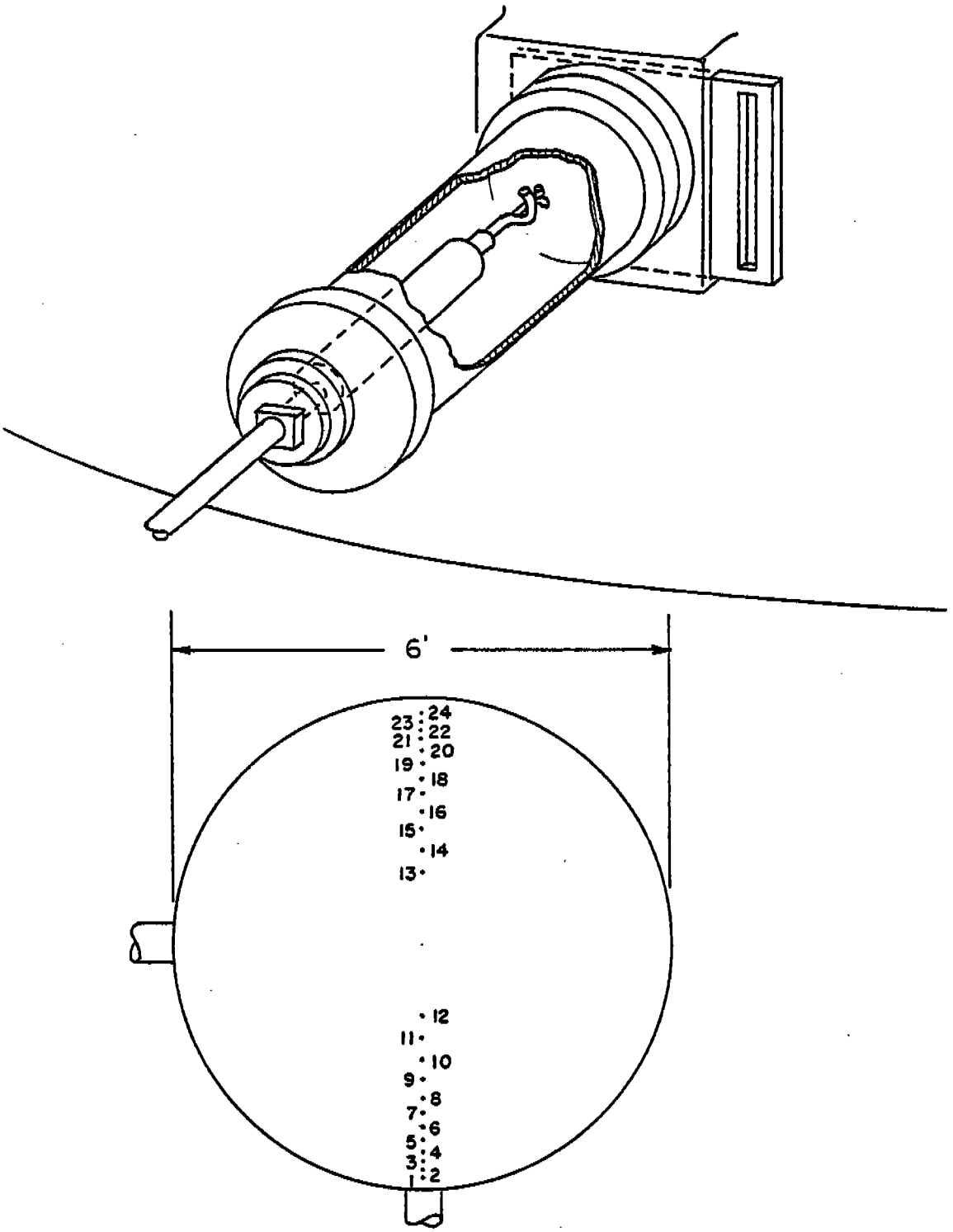


FIGURE 16. INLET STACK SPECIAL ADAPTER WITH GATE VALVE SHOWING POSITION OF ALUNDUM THIMBLE PRIOR TO SAMPLING

due to insufficient probe length; therefore, the second half of the stack was traversed without the holding chamber. Working conditions were very undesirable because of the hot exhaust gases (180-200 F) escaping through the 6-inch-diameter nipple at approximately 300 cfm. During the second half of each of the two stack traverses, the gate valve was opened, the probe was inserted into the stack against the flow of hot exhaust gases, the 6-inch pipe reducing coupling was threaded into the valve assembly, and traversing continued.

Figure 17 shows the inlet stack geometry relative to sampling locations. According to the December 23, 1971, Federal Register[3], Method 1, sampling two diameters upstream and less than one diameter downstream from a disturbance requires at least 48 sampling points, 24 on a diameter as indicated on Figures 16 and 17. Specific distances for traverse points are given in Table 16.

Outlet of Mist Eliminator

Particulate and gaseous emissions were sampled at the outlet of the mist eliminator. Figure 18 shows the geometry relative to the sampling locations. According to the December 23, 1971, Federal Register, Method 1, 22 sampling points per stack diameter were required relative to the associated upstream and downstream stack diameters. Table 17 shows specific distances for traverse point locations.

Prior to outlet particulate sampling, it was necessary to install straightening vanes to reduce the cyclonic swirl caused by the mist eliminator. This was accomplished by the insertion of two 8-foot lengths of metal at right angles to each other as depicted in Figure 18.

TABLE 16. TRAVERSE PORT LOCATIONS--INLET

Point	Percent of Diameter	Distance from Outside of Sample Port[a], in.	Point	Percent of Diameter	Distance from Outside of Sample Port[b], in.
1	1.1	41	13	60.2	57-3/8
2	3.2	42-1/8	14	67.7	61-3/4
3	5.5	44	15	72.8	65-3/8
4	7.9	45-3/4	16	77.0	68-1/2
5	10.5	47-5/8	17	80.6	69
6	13.2	49-1/2	18	83.9	73-3/8
7	16.1	51-5/8	19	86.8	75-1/2
8	19.4	54	20	89.5	77-1/2
9	23.0	56-5/8	21	92.1	79-1/4
10	27.2	59-5/8	22	94.5	81
11	32.3	63-1/4	23	96.8	82-3/4
12	39.8	68-5/8	24	98.9	84

(a) Using "holding chamber".
(b) Using "short nipple".

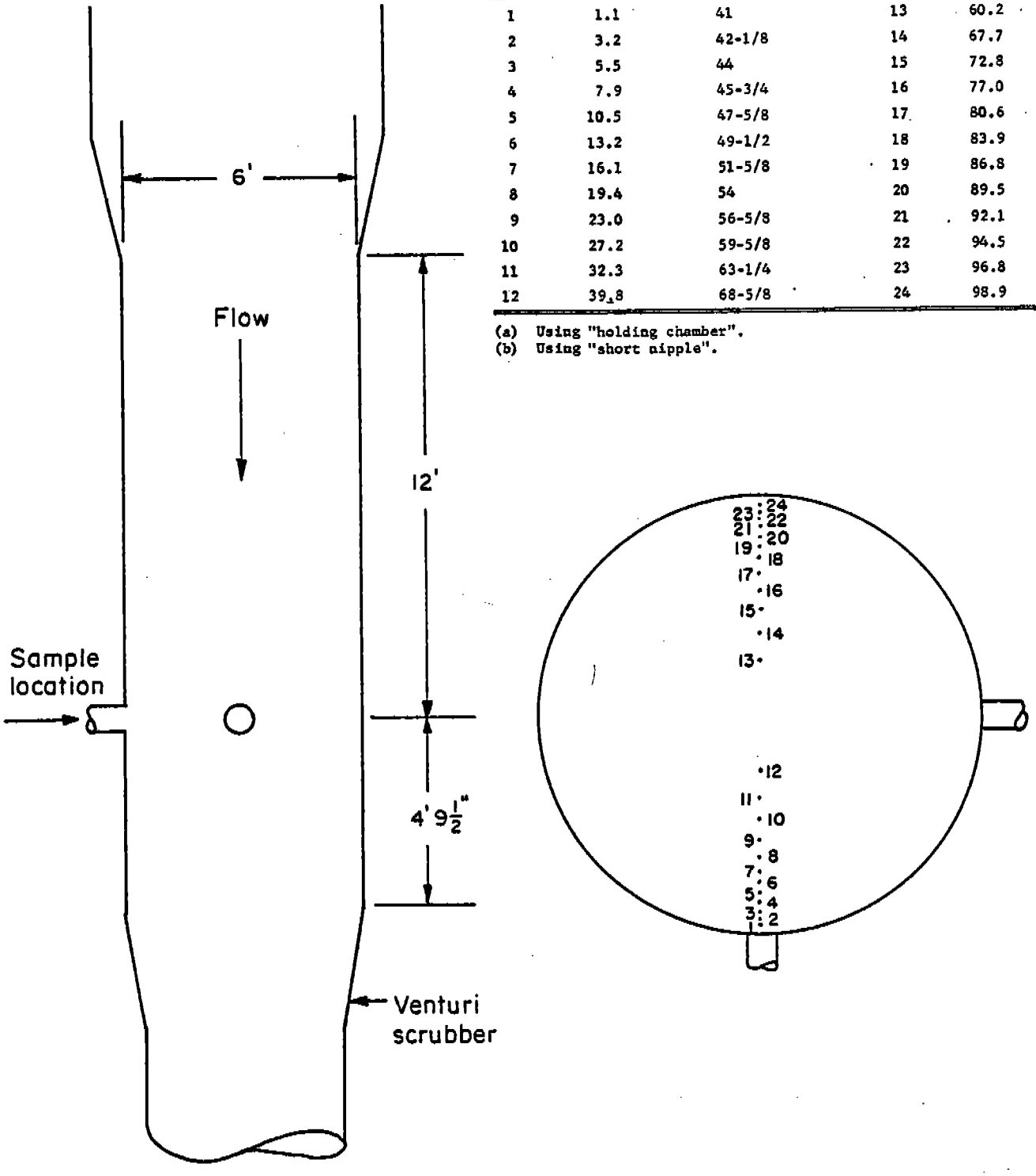


FIGURE 17. INLET STACK GEOMETRY SHOWING SAMPLING LOCATION AND SAMPLE POINT CONFIGURATION

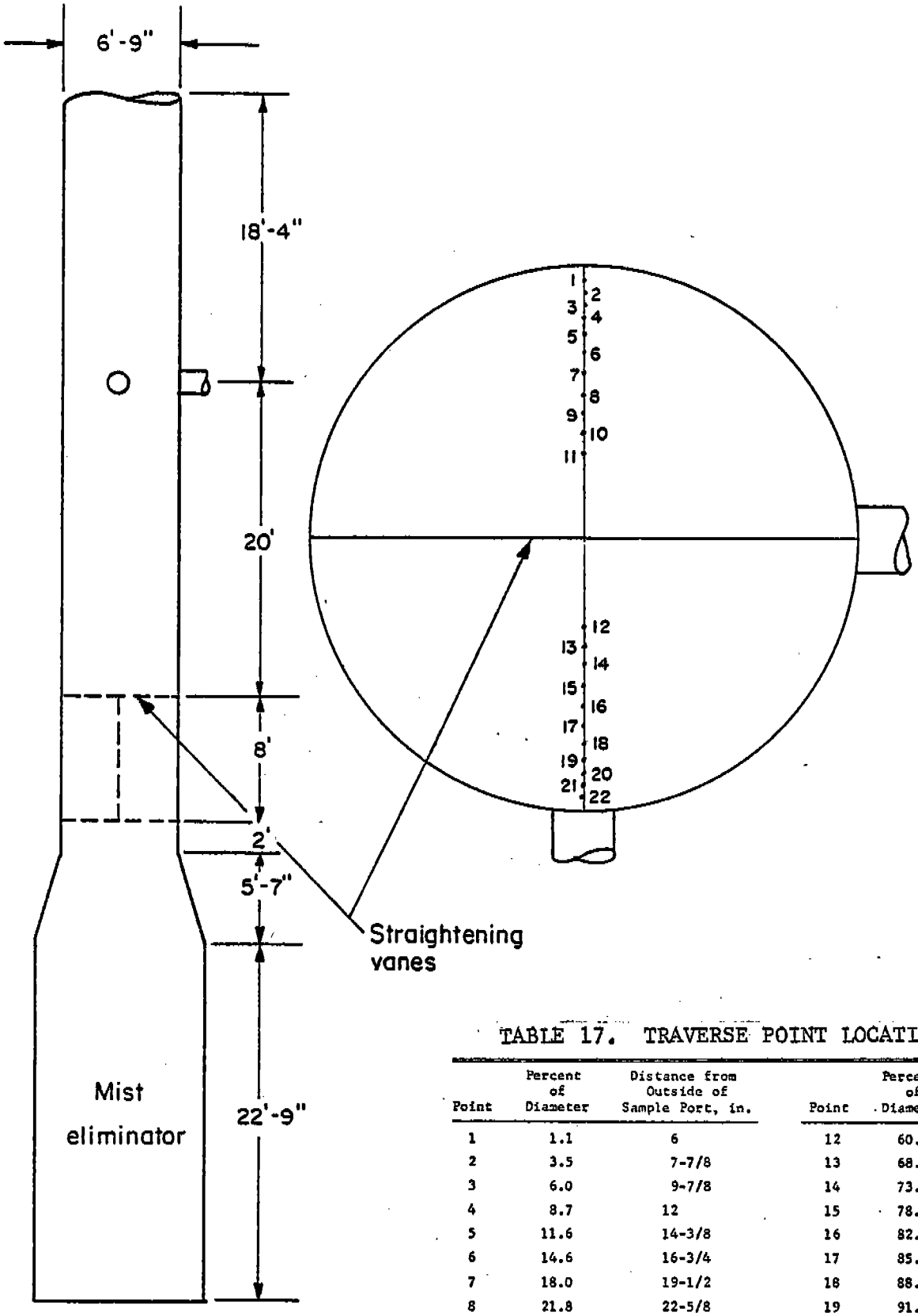


TABLE 17. TRAVERSE POINT LOCATIONS --OUTLET

Point	Percent of Diameter	Distance from Outside of Sample Port, in.	Point	Percent of Diameter	Distance from Outside of Sample Port, in.
1	1.1	6	12	60.7	54
2	3.5	7-7/8	13	68.5	60-3/8
3	6.0	9-7/8	14	73.9	64-3/4
4	8.7	12	15	78.2	68-1/4
5	11.6	14-3/8	16	82.0	71-1/4
6	14.6	16-3/4	17	85.4	74
7	18.0	19-1/2	18	88.4	76-1/2
8	21.8	22-5/8	19	91.3	78-3/4
9	26.1	26-1/8	20	94.0	81
10	31.5	30-1/2	21	96.5	83
11	39.3	36-3/4	22	98.9	84-3/4

FIGURE 18. OUTLET STACK GEOMETRY SHOWING SAMPLING LOCATION AND SAMPLE POINT CONFIGURATION

PROCESS DESCRIPTION AND OPERATION

The Westmoreland Coal Company installation near Quinwood, West Virginia in Nicholas County thermally dries Pocahontas No. 3 Sewell and Dorchester-Imboden coal. The demand for thermal drying is due to freight rate savings, the elimination of handling problems due to freezing, and the needs of the customer's process (coke ovens must control bulk density and power plants must control plugging of pulverizers). A venturi scrubber is used to control particulate emissions from the thermal dryer. Tests for particulate emissions were conducted on the thermal dryer exhaust only during periods of typical plant operations.

Process Description

Coal is delivered to the plant and is crushed to a variety of sizes. It is then washed, screened and separated by both water tables and concentration tables. The coal washing is a continuous process and reduces ash content from 16 percent to 3 percent.

The coal that is thermally dried, the 3/8 x 0-inch coal or the slack is dewatered by shaker tables and vacuum discs and then dried to 2.0 percent to 3.5 percent surface moisture in a thermal dryer. Coal drying is accomplished by use of flue gas (produced by a coal-fired furnace) reduced in temperature by dilution air. The emissions from the fluidized bed thermal dryer are exhausted to a chamber loaded with 40 or more multiclones which separate much of the fine dust from the emissions. The finer dust particles pass from the multiclones of the dryer through a high pressure blower to a venturi scrubber and a demister where over 95 percent of the particles are collected. The emissions to the atmosphere are ducted via an 81-inch diameter stack. Figure 19 is a sketch of the thermal dryer system. The design capacity of the thermal dryer is 270 ton/hr of coal at approximately 250 F. The plant is usually operated at two-thirds to three-fourths of this rate because of the moisture level. The actual operating capacity of the dryer is limited by the tons of water evaporated per hour rather than the amount of coal being processed. The plant runs on a schedule of two 8-hour shifts and is typically closed on weekends.

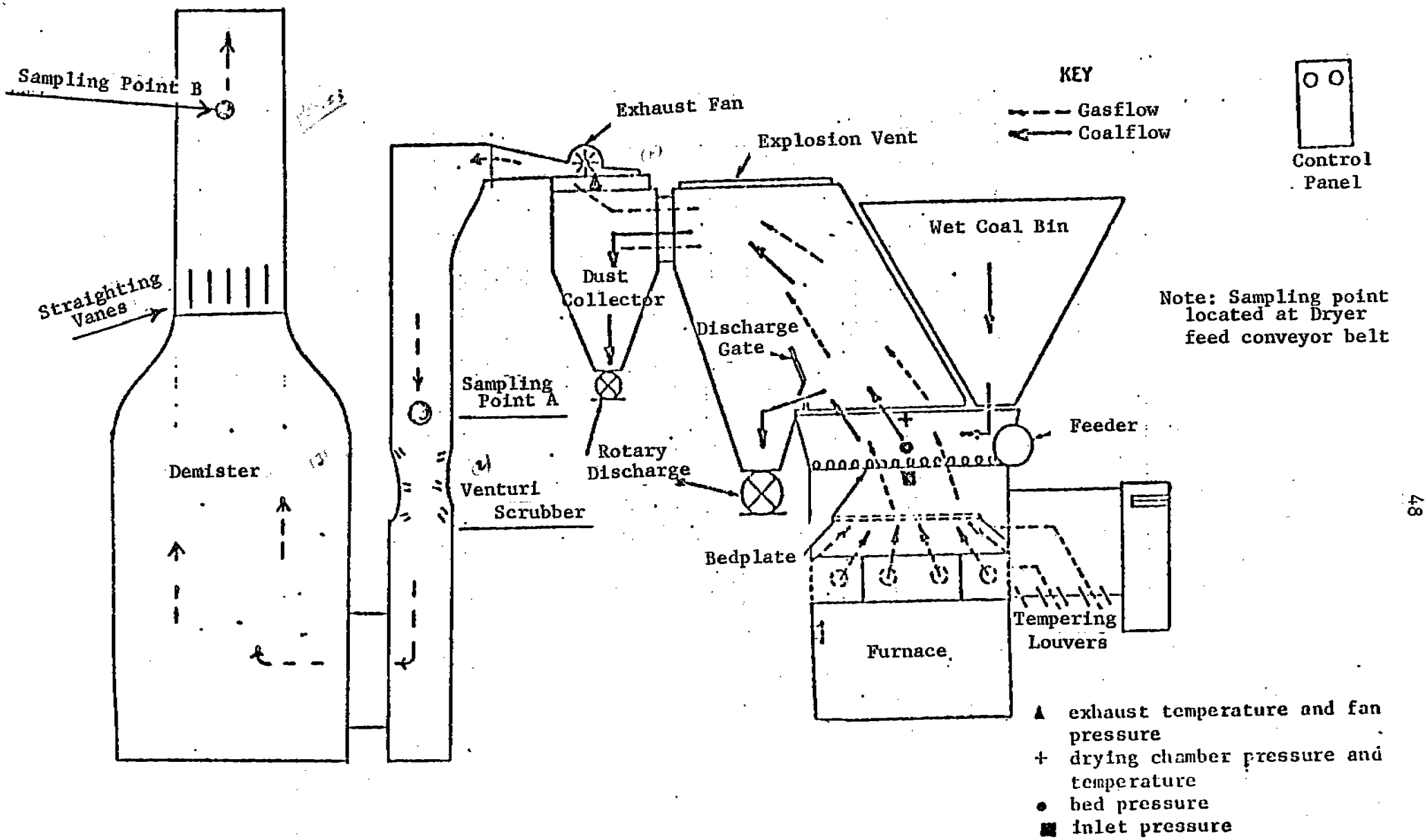


FIGURE 19. EXHAUSTING-TYPE FLUIDIZED-BED THERMAL COAL DRYER, SHOWING COMPONENT PARTS AND FLOW OF COAL AND DRYING GASES, WESTMORELAND COAL COMPANY, IMPERIAL SMOKELESS DIVISION, QUINWOOD, WEST VIRGINIA

Emission Control Equipment

The thermal dryer exhausts into a cyclone separator where the large particles are removed. Next, the exhaust is blown into the venturi scrubber where the fine particles are impacted upon water droplets which are removed from the effluent gases by the mist eliminator. From there, the exhaust gases exit the mist eliminator and go out the stack. The fan volume is rated at 134,000 cfm for the maximum design capacity of 270 ton/hr. The pressure drop across the venturi scrubber is 32 in. H_2O, 3 to 4 in. H_2O attributable to the mist eliminator.

Process Operation

Samples were collected from the inlet and outlet gases to the venturi scrubber control equipment. Opacity observations and dryer feed samples were gathered concurrently. Each test run is described as follows.*

June 18, 1975 - Refer Appendix E Run 1

Test went well with only one interruption that occurred due to low feed. Also, Sewell No. 3 strip mined coal was used for the majority of the time instead of Sewell deep-mined coal. Though the data are not suitable for evaluation of Sewell No. 7, they do provide an interesting comparison between the two coal mining methods.

June 19, 1975 - Refer Appendix E Run 2

The test had only two interruptions but process operations were unsteady. Feed to thermal dryer was discontinued, problems with the water supply to the venturi scrubber were suspected, and the supply of raw coal to the plant was inconsistent. These data are not typical of routine operation. Repairs were made to the venturi scrubber water supply system prior to commencing the next test.

June 20, 1975 - Refer Appendix E Run 3

The test was very good, even though it was necessary to temporarily suspend sampling twice due to process malfunctions. Process on the whole operated very smoothly, and during actual testing was very consistent. The test data are representative of typical operations.

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*Run numbers are relative to outlet.

June 23, 1975 - Refer Appendix E Run 4

Test was very good with no delays at all. High drying chamber temperatures occurred for one-half hour from 4:45 to 5:20 p.m. but were not extreme.

June 24, 1975

Process shut down every half hour due to broken equipment. There was no continuity to process whatsoever. Testing was cancelled for the day.

June 25, 1975 - Refer Appendix E Run 5

Test very good. Sampling was interrupted briefly during two short process delays. Drying chamber temperatures were a bit high from 12:30 p.m. to 1:05 p.m. and from 4:40 p.m. to 5:03 p.m. but were not abnormal.

June 26, 1975 - Refer Appendix E

Several special inlet tests were done by Roy Neulicht. The first and second tests were good with no problems. The third and fourth tests had high but not normal drying chamber temperatures. All tests were conducted during the processing of Sewell No. 7 deep-mined coal except the fourth test which was Park Sewell or Sewell No. 3 strip-mined coal.

The production for the second half of Test No. 5 (June 25, 1975) was determined to be 180 ton/hr. The average process rate for that day, however, was only 137.7 ton/hr because of production stoppages (see Table 18). The rate during actual sampling was higher. The reason for this inconsistency is that testing was never done during process malfunctions or slow ups because of the abnormally high drying chamber temperatures that occur. The emission tests were conducted only during periods when conditions were typical of routine operation and the data, therefore, are representative of normal production.

TABLE 18. PRODUCTION RATES
(June 25, 1975)

Recorder	Time Period	Amount Time, minutes	Process Rate, ton/hr
Westmoreland Coal Co.	Both shifts	1035	137.7
EPA	10:00 to 11:18	438	158.9
EPA	14:55 to 16:18	83	187.9
EPA	16:18 to 17:18	60	180.0

SAMPLING AND ANALYTICAL PROCEDURES

Plant operations, by necessity, were monitored by EPA personnel prior to and during all sampling to ensure the validity of the measurements being presented in this report.

Standard EPA sampling methods, as reported in the December 23, 1971, Federal Register, were followed to obtain samples of gaseous emissions for CO_2, CO, and O_2. Samples of scrubber water and process coal were taken under the direction of the EPA Project Officer. Sample times are reported in the Sample Collection Log presented in Appendix D.

A temporary on-site lab facility was set up for equipment cleanup. Due to the nature of the process, it was important to isolate, as much as possible, the cleanup and analytical area from plant operations.

Analytical balances were set up in the temporary lab and mass determination of BCL inlet and outlet samples and for the EPA cyclone catches were determined on site after each run. All calculations pertinent to isokinetic sampling were determined after each run to ensure results were within EPA guidelines.

Coal Sample Collection Method

Representative samples of the process coal were collected for sieve analysis during each run. Figure 20 depicts the process feed system used at the Westmoreland Coal Company and also gives a pictorial diagram of how coal sample aliquots were collected.

The conveyor pushes the coal into a large hopper where it is fed into the dryer. The bulk or large mass of the coal falls into the hopper just as it passes the end of a stationary, inclined ramp. As the conveyor reaches the end of its travel and starts its return, additional coal which has adhered to the conveyor surface is thrown off and appears in the hopper as relatively fine particles.

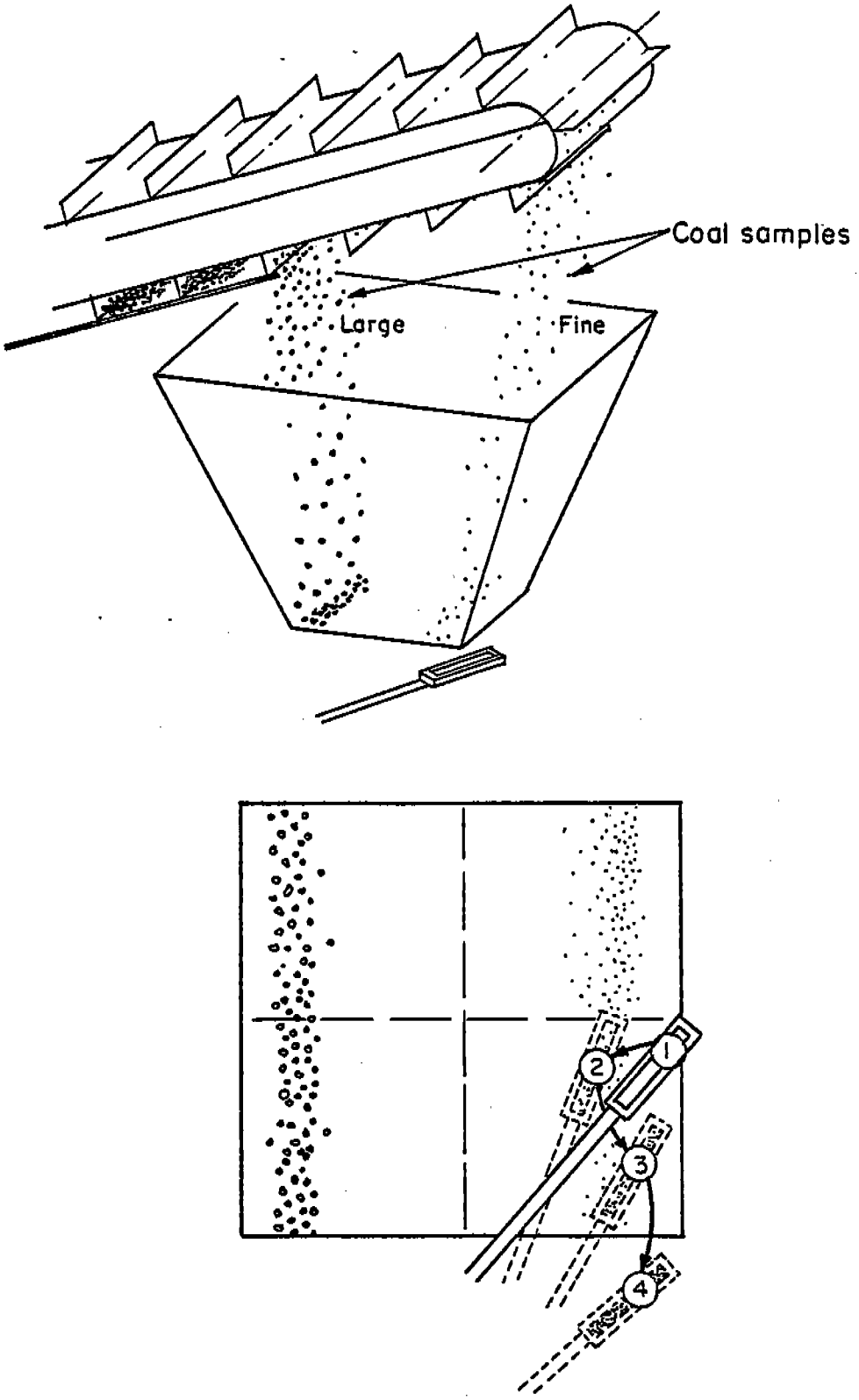


FIGURE 20. COAL SAMPLE COLLECTION METHOD

The hopper outlet coal samples were collected from each of four quadrants as depicted in Figure 20. The sample collector, fabricated according to ASTM standards[4], was inverted and placed behind the stream of coal as in Position 1. The collector was then turned upright and moved into and through the stream of coal as in Positions 2, 3, and 4. The sample collector was emptied into a sample container and the collection method was repeated for each of the other quadrants to obtain one composite sample. Three samples were collected each 15 minutes during the entire particulate sample run. The coal samples for each run were combined and a fraction was removed for sieve analysis according to ASTM Standards[4].

Scrubber Water Collection

To develop a better understanding of the operation and effectiveness of the venturi scrubber, samples of water which had passed through the venturi were collected at the outlet of the scrubber sump. Figure 21 is a simple schematic depicting the basic flow pattern of the scrubber system. As indicated, about 80 percent of the scrubber sump water is recirculated back to the venturi for reuse while the other 20 percent is sent to a static thickner where the particles collected in the scrubber water settle by gravitational forces. The scrubber water sample to be used for size distribution of the collected particles was taken from the 20 percent by-pass line as indicated. It is assumed that sufficient water flow is maintained in the recirculation system to allow a representative water sample to be collected relative to the associated outlet emission sampling. If this assumption is valid then a comparison can be made of the inlet particle size distribution and the associated particle size measured in the scrubber water. However, it should be noted that the particles collected in the scrubber water represent a time-averaged representation of the particles removed from the gas stream. The volume of the scrubber sump relative to the 20 percent discharge volume flow would indicate the extent of time averaging involved relative to the gas sampling time. Only if there exist steady-state scrubber operation and

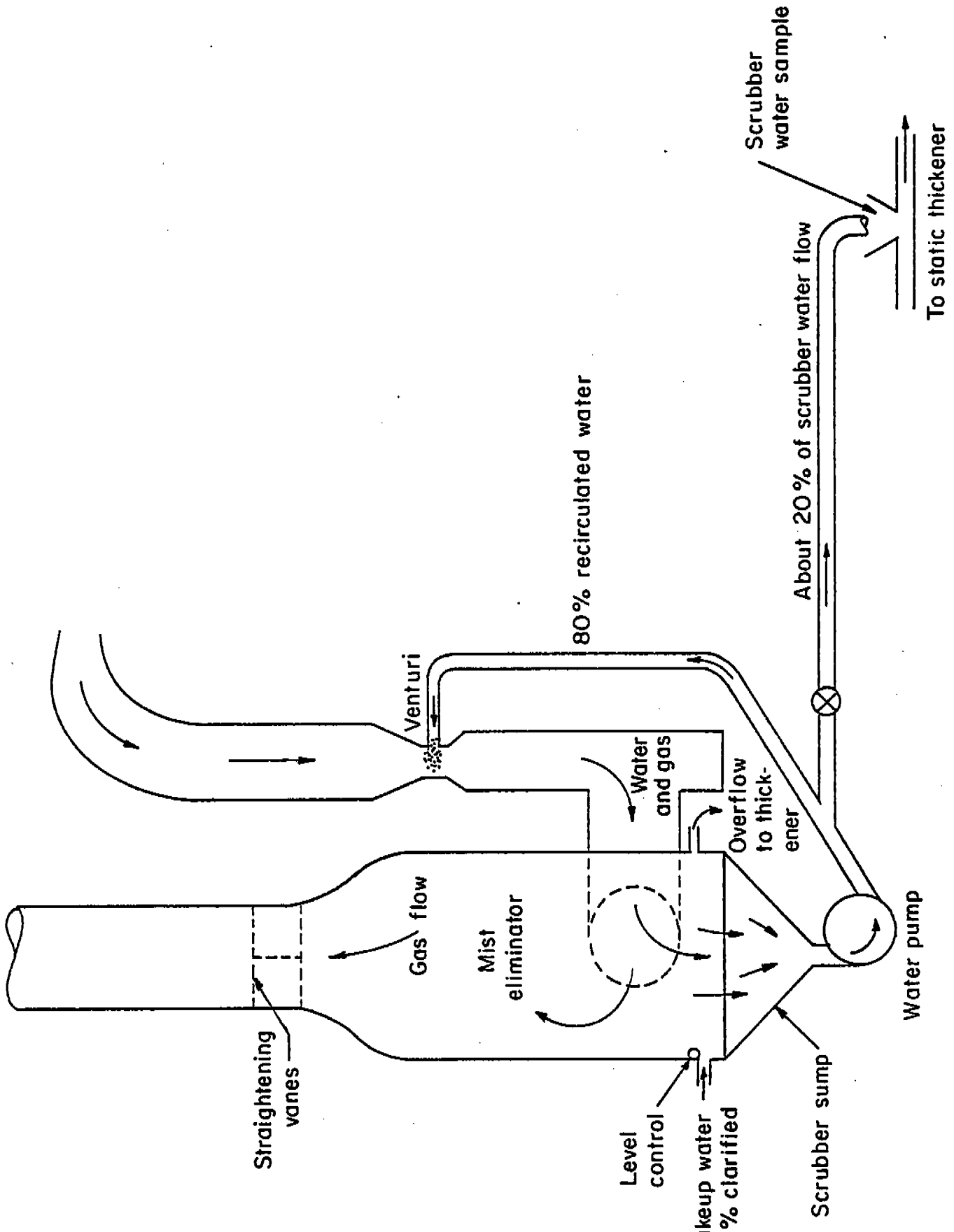


FIGURE 21. SCHEMATIC OF VENTURI SCRUBBER WATER FLOW SYSTEM

an unchanging gas borne particulate feed to the scrubber can the particles found in the scrubber be directly compared with gas samples for evaluating scrubber performance.

Particle Sizing Methodology

Particulate samples were collected by sampling the venturi scrubber inlet stack gases at an isokinetic rate into an Alundum thimble. During sampling, the thimble was located in the stack and was at stack gas temperatures, thereby minimizing condensation. Size distribution for particles collected in the thimbles, in a cyclone sampler, and from bulk coal samples were determined with a Coulter Counter[1]. A Mine Safety Appliance (MSA) Particle Size Analyzer[2] complemented Coulter Counter data relative to <325 mesh samples. The following questions were considered relative to analysis techniques which, if not applied properly, could alter the reported particle size distribution:

(1) What effect would sample drying have on the particle size distribution?

(2) Would particle dispersion by ultrasonic vibration alter the particle size distribution?

(3) What particle concentrations would be "generated" from thimble breakup during ultrasonic cleaning?

(4) If ultrasonic thimble cleaning were feasible because of insignificant thimble particle concentration, would it be possible to obtain a representative aliquot from a relatively large electrolyte volume?

(5) Since the MSA particle size analyzer utilizes various fluids to determine particle size from settling velocity, might the coal particles be soluble enough in the fluids to affect their sizes?

Experimental efforts were undertaken to answer these questions so that a valid experimental procedure for size distribution measurements could be established. The following particle size distribution results are an average of three runs per aliquot, which is a routine procedure for Coulter Counter analyses. One aliquot per sample was taken for Coulter Counter analyses and one aliquot per sample was taken for analyses by the Mine Safety Appliance Particle Size Analyzer.

Distribution Change Due to Drying[a]

It was determined by desiccator drying of samples collected in thimbles at the scrubber inlet that they contained <1.0 percent moisture; therefore, particle size change due to drying was expected to be insignificant. This was verified by Coulter Counter size analyses as shown in Figure 22. Only slight differences between the particle size distribution curves of "undried" or "dried" samples are seen. These differences are considered to be within experimental error and, hence, no effect of coal sample drying was found.

The bulk process coal samples were wet when collected and, therefore, a change in particle size distribution due to drying was considered. An extra bulk feed coal sample was divided into two equal portions according to ASTM standards[4]. One half was dried at 100 F and sieved dry. The other half was sieved wet to determine if the size distribution would show a difference. Figure 23 shows the results of these measurements which indicate essentially no difference except in the pan catch (<325 mesh or <44 μm) which shows a slightly higher catch for the wet sieving. This could be attributed to experimental error or possibly the loss of the relatively fine catch during the drying process.

Effect of Ultrasonic Dispersion Compared with Mechanical Dispersion

Before particle dispersion by ultrasonic techniques could be utilized, it was necessary to determine to what extent the particle size distribution would be altered by ultrasonic dispersion techniques and what procedures were sufficient to assure adequate dispersion. A sample

(a) The effects of drying on size distribution were determined with coal samples which may not have been representative aliquots and, therefore, the data can only be considered relative with respect to size distribution and are valid only for evaluating drying effects.

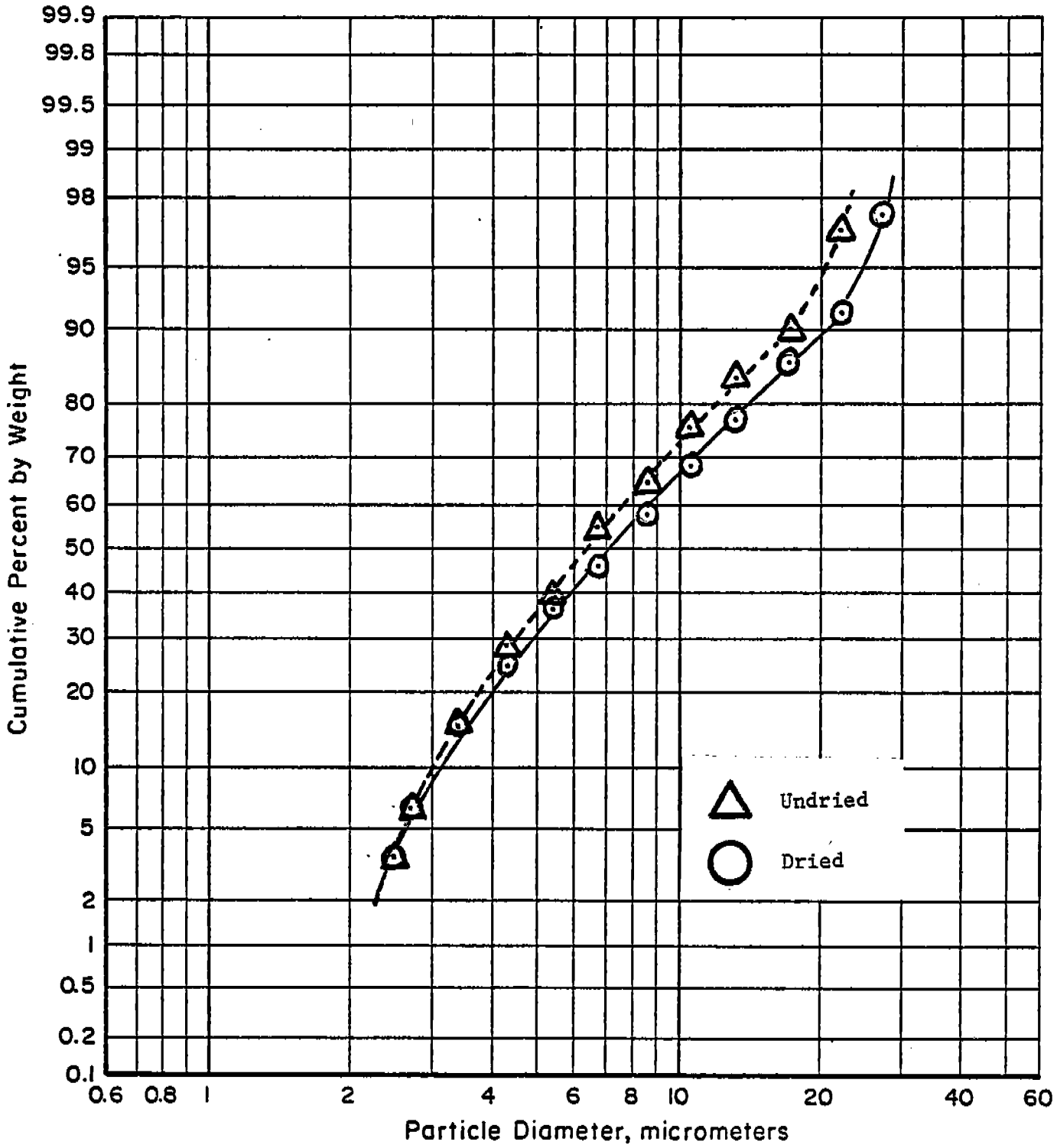


FIGURE 22. DISTRIBUTION OF DRIED AND UNDRIED COAL SAMPLES FROM A THIMBLE CATCH, COULTER COUNTER ANALYSES

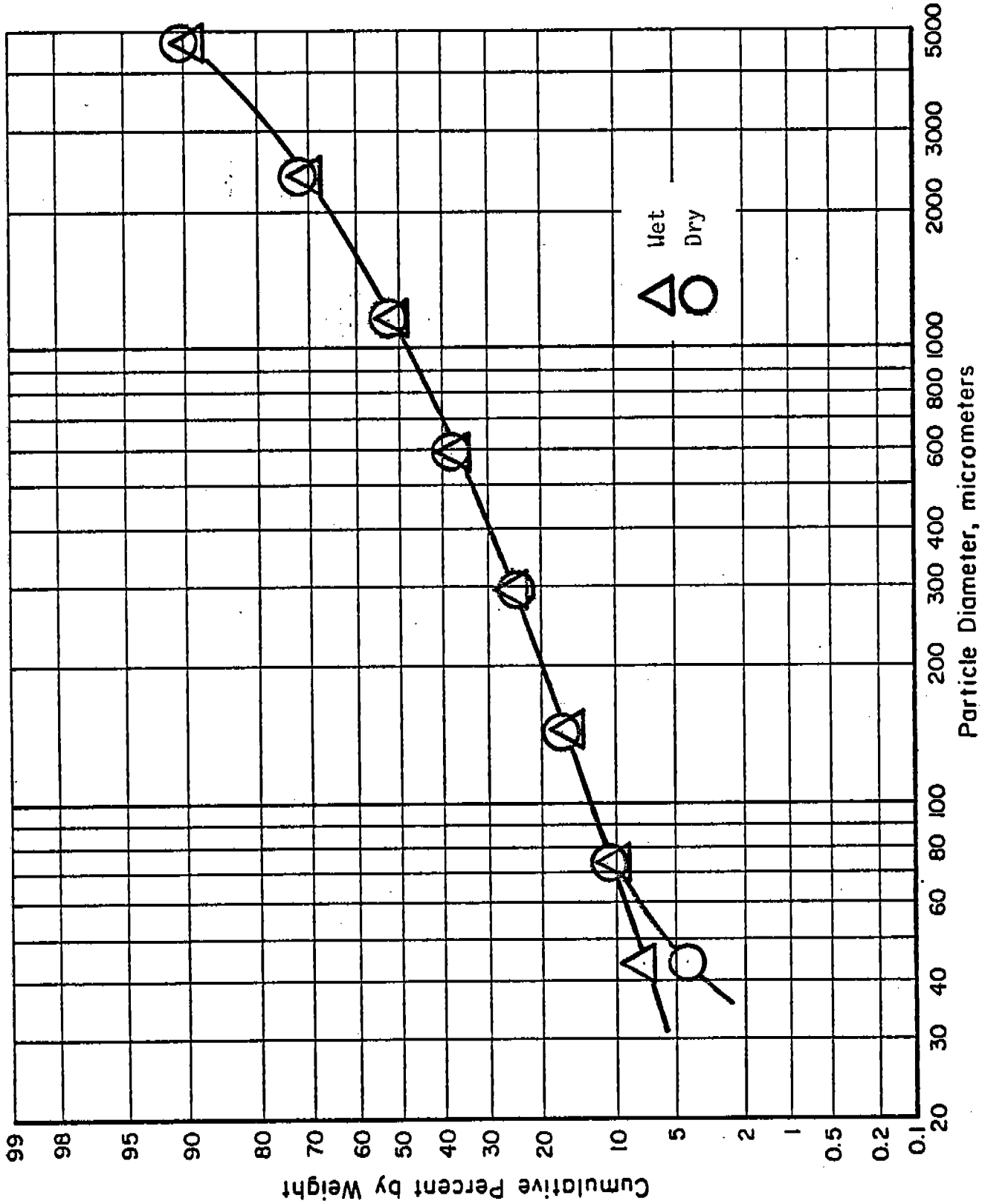


FIGURE 23. COMPARISON DISTRIBUTION OF WET AND DRY SIEVED PROCESS COAL SAMPLES

aliquot of a thimble catch was placed in a dram vial containing the wetting agent and electrolyte solution. Mixing was accomplished by repeated filling and emptying of a medicine dropper (the usual technique for dispersing particles prior to Coulter Counter sizing). A size distribution then was determined for an aliquot of this dispersion. The dispersion was then subjected to ultrasonic vibration; another aliquot was removed, and a size distribution determined. Figure 24 depicts the results of the two dispersion methods. Although slight differences can be seen, the differences are within experimental error and it can be concluded that either method of dispersion could be used without substantial error. (This conclusion applies only to the specific samples of this task. Other materials could possibly respond differently depending on their morphology and wetting properties.) Particles from the solutions used in the analysis by the Coulter Counter were collected on a silver membrane filter and observed by means of a scanning electron microscope for possible size differences in an additional effort to verify that ultrasonic dispersion did not modify the particle size. Electron photomicrographs were taken of representative areas of the filters and it was observed from these photos that the particles are essentially the same in number and size with and without ultrasonic dispersion.

Ultrasonic Cleaning of Alundum Thimble

To determine the extent and nature of particle release from an unused thimble, a new Alundum thimble was placed in 825 cc of 4.0 percent sodium chloride (Coulter Counter electrolyte) and cleaned by ultrasonic vibration for 30 minutes at a nominal frequency of 28 kHz $\pm$ 1.5 kHz. This procedure was repeated three times, each time using the same thimble in clean electrolyte to determine if any change would occur in the rate of particle generation. A size distribution by Coulter Counter was determined from each 825-cc volume. Table 19 compares the total number of particles generated each time by ultrasonic cleaning.

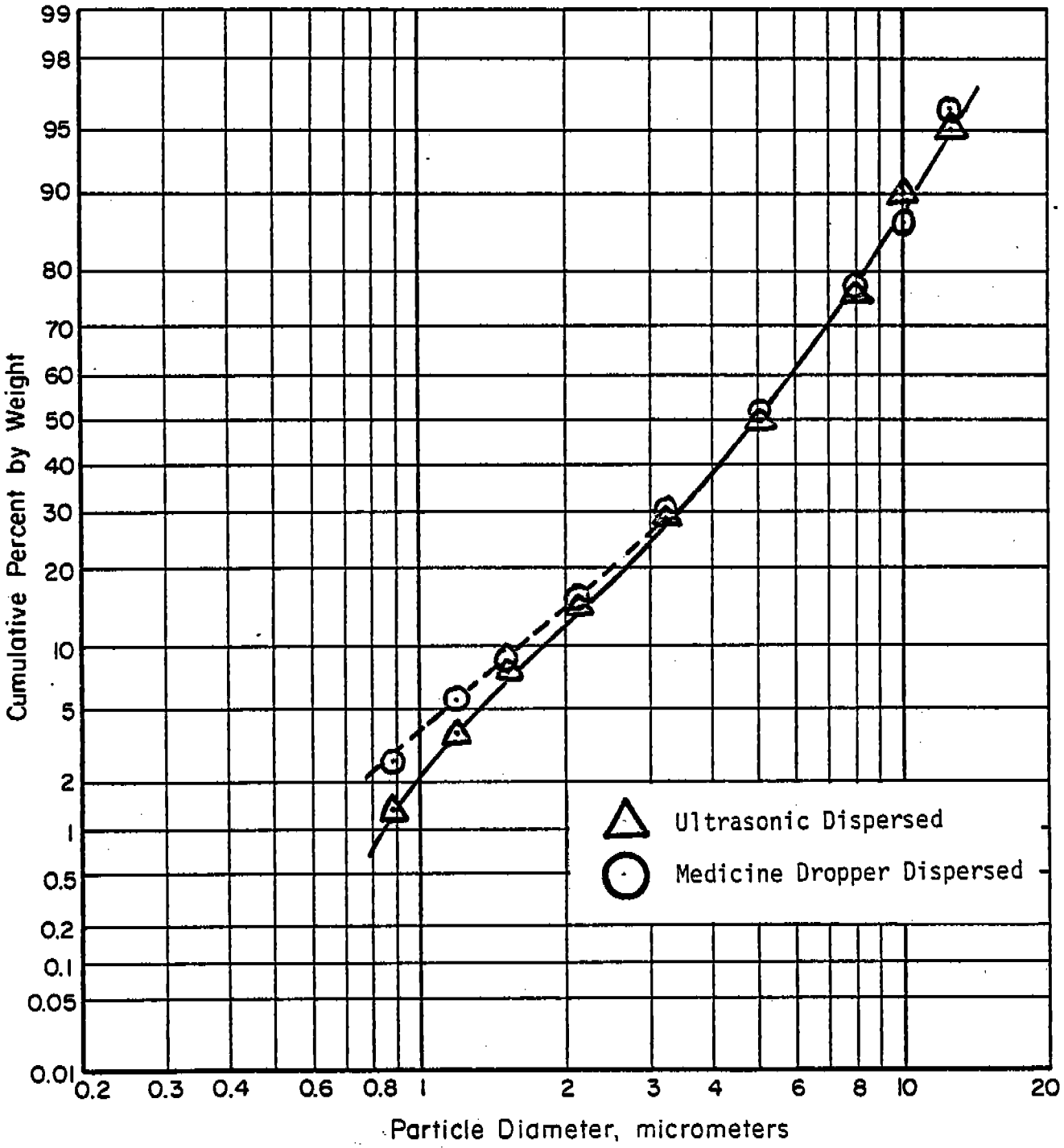


FIGURE 24. COMPARISON OF ULTRASONIC AND MEDICINE DROPPER DISPERSION TECHNIQUES, COULTER COUNTER ANALYZER

TABLE 19. PARTICLES GENERATED FROM ULTRASONIC THIMBLE CLEANING, COULTER COUNTER ANALYSES

Size, μm	Accumulative Number of Particles Larger Than Indicated Size, x 10^{-3}		
	Run 1	Run 2	Run 3
22.0	0	2	0
17.5	0	3	3
14.0	0	16	5
11.0	13	38	3
8.8	83	51	25
7.0	173	130	61
5.5	233	231	125
4.4	488	393	229
3.5	1,023	690	338
2.8	1,922	904	546
2.2	3,235	1,548	843
1.7	10,213	3,765	2,020

It appears that the number of particles generated decreases with each successive cleaning and begins to level off to some extent. One can conclude from these data that thimble cleaning prior to use may reduce error in the size-distribution data where relatively small sample catches are expected.

Relative Comparison--
Particle Concentration

The importance of the relative concentration of thimble-generated particles compared with collected coal particles in the particle population being sized was determined. Sample contamination due to ultrasonic thimble cleaning was found to be insignificant when determining size distribution if a sufficient sample mass was collected. Table 20 shows the total number of particles generated during initial thimble cleaning is of the order of 10×10^6 and is significantly reduced with successive cleanings. For comparison, it has been determined, during this study, that the total number of particles in a measured aliquot of 2.16 mg of coal is of the order of 12×10^6. During this study, the thimble sample catch range was from 9,271 mg to 26,167 mg (see Table 7). By ratio (9,271 mg:2.16 mg), the thimble sample particle population is greater by at least a factor of the order of 4,000. Therefore, it can be concluded that the relative number of particles generated by thimble cleaning is insignificant by comparison with the mass contained in any of the thimble samples collected during this study. As previously mentioned, if one expects a relatively small thimble catch it would be advisable to preclean the thimble several times before use to eliminate the possiblity of a significant background particle contribution.

Representative Aliquots From Large Electrolyte Volumes

Thimble cleaning and particle dispersion were both accomplished via ultrasonic vibration. The thimble contents were emptied into a beaker containing 825 cc of isopropyl alcohol, the alcohol being used because of its wetting characteristics. The thimble was then placed into the alcohol bath and ultrasonically vibrated at a nominal frequency of 28 kHz $\pm$ 1.5 kHz for 30 minutes. Obtaining a aliquot from three different beaker levels while the particles are in suspension would give some identification of possible stratification due to nonuniform mixing and check the representative nature of aliquot collection for analysis. Figure 25 depicts the size distribution indicating that a representative aliquot can be selected from a relatively large volume of solution with a very dense particle concentration if the suspension is maintained by ultrasonic mixing. A further conclusion from these results is that the measurement technique is repeatable and random errors are small.

Coal Particle Solubility

Solubility of coal particles in the solutions used with the Mine Safety Appliance Particle Size Analyzer was found to be negligible. The operating principle of this device is essentially to measure the particle sedimentation rate as a function of time in an appropriate liquid media. The particles need to be thoroughly wetted and are placed in a feed liquid prior to being placed in the sedimentation liquid. The feed liquid consisted of 50 percent isopropyl alcohol and 50 percent heptane. A solubility check for coal particles in this mixture was made by measuring weight loss during the washing of a coal sample with a large excess of the solution. A weight loss of 0.08 percent was found which is considered to be insignificant.

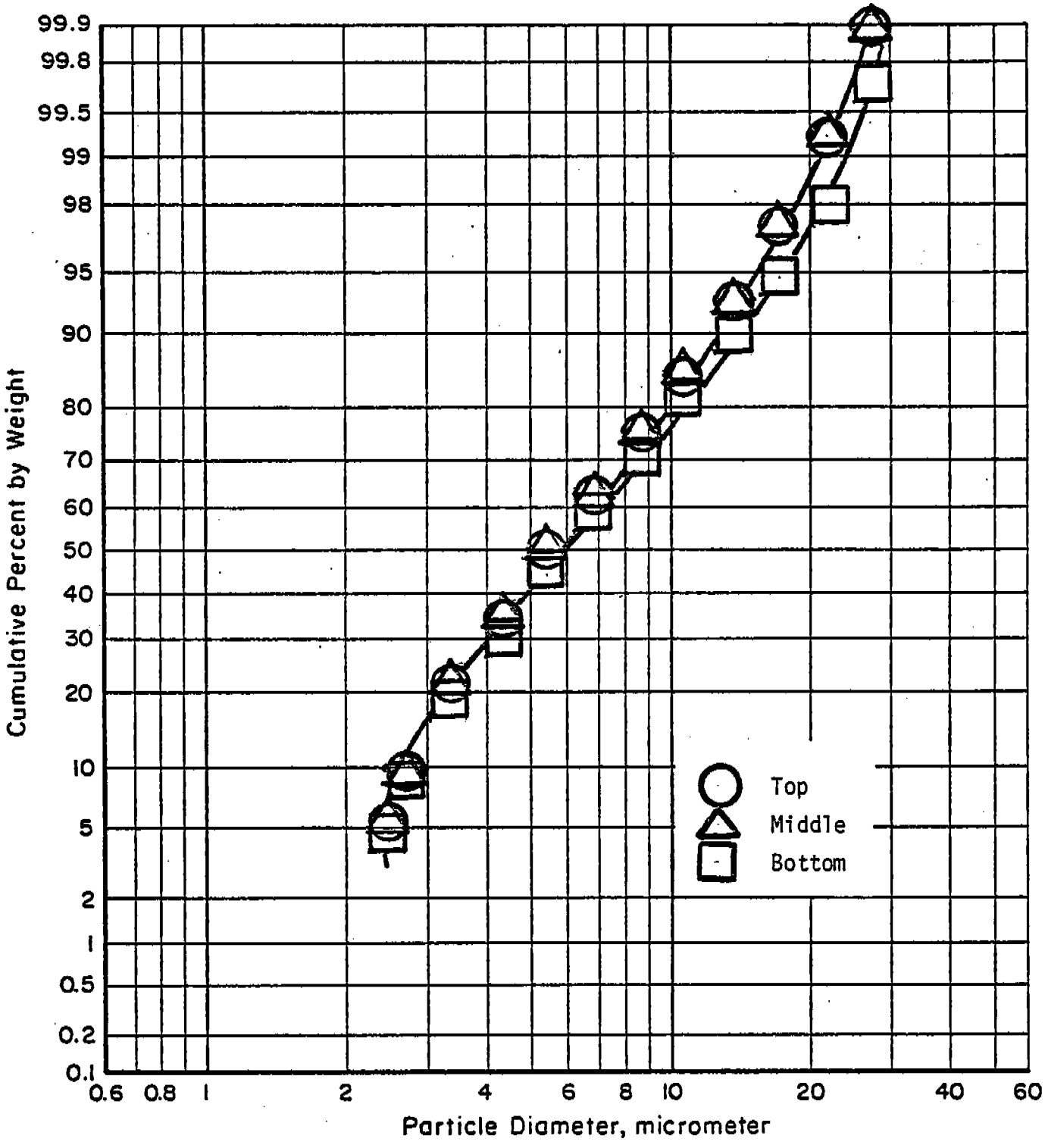


FIGURE 25. REPRESENTATIVE ALIQUOT CHECK OF LARGE SOLUTION VOLUME HAVING HIGH-PARTICLE DENSITY, COULTER COUNTER ANALYSES

REFERENCES

(1) Coulter Counter Industrial Model B Instruction Manual, Coulter Counter Industrial Division, Franklin Park, Illinois 60131.

(2) Whitby, K. T., "A Rapid General Purpose Centrifuge Sedimentation Method for Measurement of Size Distribution of Small Particles", Mechanical Engineering Department, University of Minnesota, 1955; presented at the 61st Annual Meeting of ASHRAE, Philadelphia, Pennsylvania, January, 1955.

(3) Federal Register, December 23, 1971, Vol. 32, No. 247.

(4) 1974 Annual Book of ASTM Standards, Part 26, "Gaseous Fuels; Coal and Coke, Atmospheric Analysis", American Society for Testing and Materials, Philadelphia, Pennsylvania 19103, 1974.

(5) Federal Register, November 12, 1974, Vol. 39, No. 219.

APPENDIX A

COMPLETE PARTICULATE RESULTS

APPENDIX A

COMPLETE PARTICULATE RESULTS

TABLE A-1. INLET RESULTS

WESTMORELAND COAL COMPANY INLET RESULTS

	RUN NO.	1	2	4	5	6
	TEST DATE	6/18	6/19	6/20	6/23	6/25
	SAMPLING TIME, 24 HOUR CLOCK FROM	1825	1357	1503	1608	1120
	TO	2209	1613	1719	1941	1710
DN	SAMPLING NOZZLE DIAMETER, IN.	0.175	0.175	0.175	0.175	0.175
TT	NET TIME OF TEST, MIN.	128	96	96	144	144
PB	BAROMETRIC PRESSURE, IN. HG ABSOLUTE	27.60	27.32	27.57	27.68	27.61
PM	AVG. ORIFICE PRESSURE DROP, IN. H2O	2.32	2.24	2.53	2.68	2.11
VM	VOLUME OF DRY GAS SAMPLED AT METER CONDITIONS, DCF	118.3	88.8	90.4	140.0	126.6
TM	AVG. GAS METER TEMPERATURE, F	108	80	82	93	78
VMSTD	VOLUME OF DRY GAS SAMPLED AT STANDARD CONDITIONS, DSCF	102.4	80.0	81.9	125.0	115.6
VW	TOTAL H2O COLLECTED IN IMPINGERS AND SILICA GEL, ML	271.3	126.9	173.0	315.5	335.2
VWGAS	VOLUME OF H2O VAPOR COLLECTED,SCF	12.9	6.0	8.2	15.0	15.9
%M	PERCENT MOISTURE IN STACK GAS BY VOLUME	11.15	6.99	9.10	10.69	12.08
MD	MOLECULAR FRACTION OF DRY GAS	0.89	0.93	0.91	0.89	0.88
% CO2	VOLUME PERCENT DRY	1.7	0.9	1.0	0.8	0.9
% O2	VOLUME PERCENT DRY	19.1	19.8	20.0	20.0	19.7
% CO	VOLUME PERCENT DRY	0.1	0.1	0.1	0.1	0.1
% N2	VOLUME PERCENT DRY	79.1	79.2	78.9	79.1	79.3
% EA	PERCENT EXCESS AIR	1072	1786	2411	2267	1595
MWD	MOLECULAR WEIGHT OF STACK GAS, DRY BASIS	29.0	28.9	29.0	28.9	28.9
MW	MOLECULAR WEIGHT OF STACK GAS, WET BASIS	27.8	28.2	28.0	27.8	27.6
CP	PITOT TUBE COEFFICIENT	0.85	0.85	0.85	0.85	0.85
TS	AVG. STACK TEMPERATURE	166	164	171	202	181
NP	NET SAMPLING POINTS	48	48	48	48	48

TABLE A-1. (Continued)

WESTMORELAND COAL COMPANY INLET RESULTS

	RUN NO.	1	2	4	5	6
	TEST DATE	6/18	6/19	6/20	6/23	6/25
	SAMPLING TIME, 24 HOUR CLOCK FROM	1825	1357	1503	1608	1120
	TO	2209	1613	1719	1941	1710
PST	STATIC PRESSURE OF STACK GAS, IN. HG.	2.12	2.12	2.12	2.12	2.12
PS	STACK GAS PRESSURE, IN. HG ABS.	29.72	29.44	29.69	29.80	29.73
VS	STACK GAS VELOCITY AT STACK CONDITIONS, FPM	6483	6764	6727	6860	6653
AS	STACK AREA, SQ. IN.	4069	4069	4069	4069	4069
QS	DRY STACK GAS VOLUMETRIC FLOW RATE AT STANDARD CONDITIONS, DSCFM	136913	148680	144041	138019	135899
QA	STACK GAS VOLUMETRIC FLOW RATE AT STACK CONDITIONS, ACFM	183212	191155	190094	193875	188004
% I	PERCENT ISOKINETIC	98.5	94.6	100.0	105.1	99.7
% O	PERCENT OPACITY	0	0	0	0	0
TC	UNIT FEED RATE, TONS/HR	ND	ND	ND	ND	ND
MF	PARTICULATE--PROBE, CYCLONE, AND FILTER, MG	18144.0	9271.0	15368.0	26167.0	20087.0
MT	PARTICULATE--TOTAL, MG	18144.0	9271.0	15368.0	26167.0	20087.0
IC	PERCENT IMPINGER CATCH	.0	.0	.0	.0	.0
CAN	PARTICULATE--PROBE, CYCLONE, AND FILTER, GR/SCF	2.729	1.785	2.888	3.225	2.675
CAO	PARTICULATE--TOTAL, GR/SCF	2.729	1.785	2.888	3.225	2.675
CAT	PARTICULATE--PROBE, CYCLONE, AND FILTER, GR/ACF	2.038	1.387	2.187	2.294	1.932
CAU	PARTICULATE--TOTAL, GR/ACF	2.038	1.387	2.187	2.294	1.932
CAW	PARTICULATE--PROBE, CYCLONE, AND FILTER, LB/HR	3201.3	2273.3	3564.1	3812.9	3114.2
CAX	PARTICULATE--TOTAL, LB/HR	3201.3	2273.3	3564.1	3812.9	3114.2
PTF	PARTICULATE--PROBE, CYCLONE, AND FILTER, LB/TON FEED	ND	ND	ND	ND	ND
PTT	PARTICULATE--TOTAL, LB/TON FEED	ND	ND	ND	ND	ND

ND - No Data

TABLE A-2. OUTLET RESULTS

WESTMORELAND COAL COMPANY OUTLET RESULTS

	RUN NO.	1	2	3	4	5
	TEST DATE	6/18	6/19	6/20	6/23	6/25
	SAMPLING TIME, 24 HOUR CLOCK FROM	1815	1448	0943	1552	1117
	TO	2203	1736	1528	1917	1657
DN	SAMPLING NOZZLE DIAMETER, IN.	0.186	0.186	0.186	0.186	0.186
TT	NET TIME OF TEST, MIN.	132	132	132	132	132
PB	BAROMETRIC PRESSURE, IN. HG ABSOLUTE	27.59	27.67	27.67	27.68	27.61
PM	AVG. ORIFICE PRESSURE DROP, IN. H2O	1.82	1.70	1.99	2.00	1.87
VM	VOLUME OF DRY GAS SAMPLED AT METER CONDITIONS, DCF	109.5	100.5	106.7	109.2	104.0
TM	AVG. GAS METER TEMPERATURE, F	83	83	74	83	83
VMSTD	VOLUME OF DRY GAS SAMPLED AT STANDARD CONDITIONS, DSCF	99.0	91.1	98.5	99.2	94.0
VW	TOTAL H2O COLLECTED IN IMPINGERS AND SILICA GEL, ML	278.2	248.0	267.4	318.6	269.2
VWGAS	VOLUME OF H2O VAPOR COLLECTED, SCF	13.2	11.8	12.7	15.1	12.8
%M	PERCENT MOISTURE IN STACK GAS BY VOLUME	11.75	11.43	11.40	13.22	11.95
MD	MOLECULAR FRACTION OF DRY GAS	0.88	0.89	0.89	0.87	0.88
% CO2	VOLUME PERCENT DRY	1.7	0.9	1.0	0.8	0.9
% O2	VOLUME PERCENT DRY	19.1	19.8	20.0	20.0	19.7
% CO	VOLUME PERCENT DRY	0.1	0.1	0.1	0.1	0.1
% N2	VOLUME PERCENT DRY	79.1	79.2	78.9	79.1	79.3
% EA	PERCENT EXCESS AIR	1072	1736	2411	2267	1595
MWD	MOLECULAR WEIGHT OF STACK GAS, DRY BASIS	29.0	28.9	29.0	28.9	28.9
MW	MOLECULAR WEIGHT OF STACK GAS, WET BASIS	27.7	27.7	27.7	27.5	27.6
CP	PITOT TUBE COEFFICIENT	0.85	0.85	0.85	0.85	0.85
TS	AVG. STACK TEMPERATURE	113	106	110	116	112
NP	NET SAMPLING POINTS	44	44	44	44	44

TABLE A-2. (Continued)

WESTMORELAND COAL COMPANY OUTLET RESULTS

	RUN NO.	1	2	3	4	5
	TEST DATE	6/18	6/19	6/20	6/23	6/25
	SAMPLING TIME, 24 HOUR CLOCK FROM	1815	1448	0943	1552	1117
	TO	2203	1736	1528	1917	1657
PST	STATIC PRESSURE OF STACK GAS, IN. HG.	.00	.00	.00	.00	.00
PS	STACK GAS PRESSURE, IN. HG ABS.	27.59	27.67	27.67	27.63	27.61
VS	STACK GAS VELOCITY AT STACK CONDITIONS, FPM	4947	4605	5141	5179	5145
AS	STACK AREA, SQ. IN.	5120	5120	5120	5120	5120
QS	DRY STACK GAS VOLUMETRIC FLOW RATE AT STANDARD CONDITIONS, DSCFM	132543	125534	139320	135983	137815
QA	STACK GAS VOLUMETRIC FLOW RATE AT STACK CONDITIONS, ACFM	175923	163761	182820	184172	182969
% I	PERCENT ISOKINETIC	106.4	103.3	100.6	103.8	97.1
% O	PERCENT OPACITY	15	20	25	13	20
TC	UNIT FEED RATE, TONS/HR	ND	ND	ND	ND	ND
MF	PARTICULATE--PROBE, CYCLONE, AND FILTER, MG	244.4	328.1	239.6	376.9	214.2
MT	PARTICULATE--TOTAL, MG	299.7	448.2	342.9	461.4	300.2
IC	PERCENT IMPINGER CATCH	18.5	26.8	30.1	18.3	28.6
CAN	PARTICULATE--PROBE, CYCLONE, AND FILTER, GR/SCF	0.038	0.055	0.037	0.059	0.035
CAO	PARTICULATE--TOTAL, GR/SCF	0.047	0.076	0.054	0.072	0.049
CAT	PARTICULATE--PROBE, CYCLONE, AND FILTER, GR/ACF	0.029	0.042	0.029	0.043	0.026
CAU	PARTICULATE--TOTAL, GR/ACF	0.035	0.058	0.041	0.053	0.037
CAW	PARTICULATE--PROBE, CYCLONE, AND FILTER, LB/HR	43.2	59.7	44.7	68.2	41.4
CAX	PARTICULATE--TOTAL, LB/HR	52.9	81.5	64.0	83.5	58.0
PTF	PARTICULATE--PROBE, CYCLONE, AND FILTER, LB/TON FEED	ND	ND	ND	ND	ND
PTT	PARTICULATE--TOTAL, LB/TON FEED	ND	ND	ND	ND	ND

ND - No Data

TABLE A-3. ORSAT GAS COMPOSITION MEASURED AT OUTLET STACK--WESTMORELAND COAL COMPANY, QUINWOOD, WEST VIRGINIA

Run No.	Date, 1975	Time	CO_2, %	O_2, %	CO,[a] %	N_2, %	Molecular Weight of Stack Gas (Dry Basis) Run Avg., lb/lb Mole
QNC-1	6/18	1812-	1.7	19.1	<0.1	79.2	
		1945	1.7	19.1	<0.1	79.2	
			1.7	19.1	<0.1	79.2	
		Average	1.7	19.1	<0.1	79.2	29.0
QNC-2	6/19	1540-	0.9	20.0	<0.1	79.1	
		1614	0.9	19.5	<0.1	79.6	
			0.9	19.8	<0.1	79.2	
		Average	0.9	19.8	<0.1	79.3	28.9
QNC-3	6/20	1205-	1.0	20.0	<0.1	79.0	
		1235	0.9	19.9	<0.1	79.2	
			1.1	20.0	<0.1	78.9	
		Average	1.0	20.0	<0.1	79.0	29.0
QNC-4	6/23	1600-	0.7	20.1	<0.1	79.1	
		1730	0.8	20.2	<0.1	79.0	
			0.9	19.8	<0.1	79.3	
		Average	0.8	20.0	<0.1	79.1	28.9
QNC-5	6/25	1130-	1.0	19.4	<0.1	79.6	
		1334	0.7	19.9	<0.1	79.4	
			1.0	19.7	<0.1	79.3	
		Average	0.9	19.7	<0.1	79.4	28.9

(a) Orsat detection limit.

Sample Calculations--Outlet Run No. 4

1. Volume of dry gas sampled at standard conditions[a], dscf

$$V_{m_{std}} = \frac{17.7 \times V_m\left(P_b + \frac{P_m}{13.6}\right)}{(T_m + 460)} = \frac{17.7 \times 109.2 \ (27.68 + \frac{2.0}{13.6})}{(83 + 460)} = 99.2 \text{ dscf}$$

2. Volume of water vapor at standard conditions[b], scf

$$V_{w_{gas}} = 0.0474 \times V_w = 0.0474 \times 318.6 = 15.1 \text{ scf}$$

3. Percent moisture in stack gas

$$\% M = \frac{100 \times V_{w_{gas}}}{V_{m_{std}} + V_{w_{gas}}} = \frac{100 \times 15.1}{99.2 + 15.1} = 13.2$$

4. Mole fraction of dry gas

$$M_d = \frac{100 - \% M}{100} = \frac{100 - 13.2}{100} = 0.87$$

5. Molecular weight of dry stack gas

$$MW_d = (\%CO_2 \times \frac{44}{100}) + (\%O_2 \times \frac{32}{100}) + [\ (\%CO + \%N_2) \times \frac{28}{100}\ )] =$$

$$(0.8 \times \frac{44}{100}) + (20.0 \times \frac{32}{100}) + (79.2 \times \frac{28}{100}) = 28.9$$

6. Molecular weight of wet stack gas

$$MW = MW_d \times M_d + 18(1 - M_d) = 28.9 \times 0.87 + 18(1 - 0.87) = 27.5$$

(a) Dry standard cubic feet at 70 F, 29.92 in. Hg.
(b) Standard conditions at 70 F, 29.92 in. Hg.

7. Stack gas velocity at stack conditions, fpm[c]

$$V_s = 4{,}360 \times \sqrt{\Delta P_s \times (T_s + 460)} \left[\frac{1}{P_s \times MW} \right]^{1/2} =$$

$$4{,}360 \times 32.84 \left[\frac{1}{27.68 \times 27.5} \right]^{1/2} = 5{,}179 \text{ fpm}$$

8. Stack gas volumetric flow rate at standard conditions[d], dscfm

$$Q_s = \frac{0.123 \times V_s \times A_s \times M_d \times P_s}{(T_s + 460)} = \frac{0.123 \times 5{,}179 \times 5{,}120 \times 0.87 \times 27.68}{116 + 460}$$

$$= 135{,}983 \text{ dscfm}$$

9. Stack gas volumetric flow rate at stack conditions, acfm

$$Q_a = \frac{0.05645 \times Q_s (T_s + 460)}{P_s \times M_d} = \frac{0.05645 \times 135{,}983 \ (116 + 460)}{27.68 \times 0.87} = 184{,}172 \text{ acfm}$$

10. Percent isokinetic

$$\% I = \frac{1{,}032 \times (T_s + 460) \times V_{m_{std}}}{V_s \times T_t \times P_s \times M_d \times (D_n)^2} = \frac{1.032 \times (116 + 460) \times 99.2}{5{,}179 \times 132 \times 27.68 \times 0.87 \times (0.186)^2}$$

$$= 104$$

11. Particulate--probe, cyclone, and filter, gr/scf

$$C_{an} = 0.0154 \times \frac{m_f}{V_{m_{std}}} = 0.0154 \times \frac{376.9}{99.2} = 0.059 \text{ gr/dscf}$$

(c) $\sqrt{\Delta P_s \times (T_s + 460)}$ is determined by averaging the square root of the product of the velocity head (ΔP_s) and the absolute stack temperature from each sampling point.

(d) Dry standard cubic feet per minute at 70 F, 29.92 in. Hg.

12. Particulate--total, gr/dscf

$$C_{ao} = 0.0154 \times \frac{m_t}{V_{m_{std}}} = 0.0154 \times \frac{461.4}{99.2} = 0.072 \quad \text{gr/dscf}$$

13. Particulate--probe, cyclone, and filter at stack conditions, gr/acf

$$C_{at} = \frac{17.7 \times C_{an} \times P_s \times M_d}{(T_s + 460)} = \frac{17.7 \times 0.059 \times 27.68 \times 0.87}{(116 + 460)} = 0.043 \quad \text{gr/acf}$$

14. Particulate--total at stack conditions, gr/acf

$$C_{aw} = \frac{17.7 \times C_{ao} \times P_s \times M_d}{(T_s + 460)} = \frac{17.7 \times 0.072 \times 27.68 \times 0.87}{(116 + 460)} = 0.053 \quad \text{gr/acf}$$

15. Particulate--probe, cyclone, and filter, lb/hr

$$C_{aw} = 0.00857 \times C_{an} \times Q_s = 0.00857 \times 0.059 \times 135{,}983 = 68.2 \text{ lb/hr}$$

16. Particulate--total, lb/hr

$$C_{ax} = 0.00857 \times C_{ao} \times Q_s = 0.00857 \times 0.072 \times 135{,}983 = 83.5 \text{ lb/hr}$$

Note: The calculated values obtained from these equations will not reproduce the computer results which reflect 14 place accuracy for each computation.

APPENDIX B-1

VISIBLE EMISSION OBSERVATIONS
DURING PARTICULATE SAMPLING

APPENDIX B-1

VISIBLE EMISSION OBSERVATIONS DURING PARTICULATE SAMPLING

Summary and Discussion of Visible Emissions

A computer tabular summary of the field data reduced to 6-minute averages is included in Appendix B-1 and B-2. Appendix B-1 includes only data obtained during particulate sampling, whereas Appendix B-2 includes the data for all observations for the entire reading period. The Federal Register, Vol. 39, No. 219, November 12, 1974[5] is the method used for obtaining the visible emissions data.

The average opacity for each of two certified observers is determined for each successive 6-minute period consisting of the minute shown under "Time" in the left column plus the next 5 minutes. Each 6-minute running average is derived from a total of 24 readings (one reading every 15 seconds for 6 minutes). The average values of opacity are not reported for the last 5 minutes of data because it is not possible to compute a full 6-minute average. The tables show the average for the two observers and the deviations from the average for each observer, all reported to the nearest 0.1 percent.

Tables 12 and 13, presented in the body of the report, are computer summaries of Appendix B-1 and B-2 and list the frequency each observer exceeded the stated opacities. The method of computer data reduction for these tables is as follows.

> At the end of the moving time base average there is a listing of the number of times the 6-minute average for each observer, A_k, exceeds 30, 25, 20, 15, 10, and 0 percent opacity. However, the 6-minute averages listed here are exclusive, and the listing begins with the greatest opacity. By exclusive, it is meant that once a 6-minute average is listed, the readings encompassed in that 6-minute time period are not used in any other average. Because of the nature

of the moving time base averages A_k, this means that

Given: A_o, A_1, A_2, A_3, A_m

where A_o is the 6-minute average of an observer for the time period beginning at 0800 and A_1 is the 6-minute average of the observer for the time period beginning at 0801, etc.

Then: If the 6-minute average A_{10} is listed as exceeding 30 percent opacity, the moving time base averages A_5 through A_9 and A_{11} through A_{15} are excluded from any other listing. Thus when A_m is listed, A_{m-5} through A_{m+5} must be excluded from the listing.

The emissions were observed above the stack leading from the thermal dryer. This stack was 81 inches in diameter (6.75 feet) and the top of the stack was 76 feet, 8 inches above ground level. Most of the readings were taken in the afternoon from an observation point about 400 feet northwest of the stack and 50 feet above the base of the stack. The observation point for a smaller number of readings taken in the morning was about 120 feet southeast of the stack and 40 feet above the base of the stack.

A steam plume was attached to the stack for most of the time and extended anywhere from a few feet to 300 feet above the stack. Comments regarding attached steam plumes is discussed in Appendix I.

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 1
DATE: 6/18/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1809	16.	21.	18.5	-2.1	2.1
1810	17.	20.	18.7	-1.7	1.7
1811	17.	21.	19.1	-1.9	1.9
1812	17.	21.	18.6	-1.9	1.9
1813	16.	20.	18.2	-2.0	2.0
1814	16.	20.	18.1	-2.3	2.3
1815	15.	20.	17.6	-2.4	2.4
1816	15.	19.	16.9	-2.3	2.3
1817	15.	18.	16.5	-1.5	1.5
1818	15.	17.	16.0	-1.0	1.0
1819	15.	17.	16.1	-.9	.9
1820	15.	18.	16.4	-1.4	1.4
1821	15.	19.	16.9	-2.4	2.4
1822	14.	20.	17.3	-3.1	3.1
1823	13.	21.	16.9	-4.0	4.0
1824	13.	21.	16.5	-4.0	4.0
1825	13.	20.	16.0	-3.5	3.5
1826	13.	18.	15.4	-2.3	2.3
1827	14.	15.	14.5	-.5	.5
1828	14.	15.	14.5	-.1	.1
1829	14.	15.	14.5	-.1	.1
1830	15.	15.	15.0	0.0	0.0
1831	15.	16.	15.4	-.2	.2
1832	15.	15.	14.9	-.3	.3
1833	14.	16.	14.8	-.8	.8
1834	14.	16.	14.8	-.8	.8
1835	14.	16.	14.7	-1.1	1.1
1836	12.	16.	14.2	-1.9	1.9
1837	11.	16.	13.8	-2.3	2.3
1838	11.	17.	14.2	-3.1	3.1
1839	10.	17.	13.4	-3.4	3.4
1840	9.	16.	12.7	-3.5	3.5
1841	9.	15.	12.1	-2.9	2.9
1842	9.	14.	11.5	-2.3	2.3
1843	9.	13.	11.0	-2.1	2.1
1844	10.	12.	10.8	-1.3	1.3

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1845	10.	12.	11.4	-.9	.9
1846	10.	12.	11.9	-1.4	1.4
1847	9.	13.	12.7	-2.0	2.0
1848	8.	14.	11.0	-3.1	3.1
1849	7.	15.	10.9	-3.6	3.6
1850	7.	14.	10.7	-3.6	3.6
1851	6.	13.	9.7	-3.2	3.2
1852	6.	11.	9.0	-2.5	2.5
1853	6.	10.	8.2	-1.8	1.8
1854	6.	9.	7.7	-1.3	1.3

B1-3

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 2
DATE: 6/19/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1510	17.	18.	17.5	-.4	.8
1511	16.	18.	16.7	-.8	.8
1512	15.	16.	15.7	-.7	.7
1513	15.	15.	14.9	-.3	.3
1514	14.	14.	13.9	-.1	.1
1515	14.	14.	13.6	-.1	.1
1516	13.	14.	13.5	-.6	.6
1517	14.	16.	15.0	-1.3	1.3
1518	14.	17.	15.5	-1.1	1.1
1519	14.	17.	15.3	-1.6	1.6
1520	14.	18.	15.8	-1.7	1.7
1521	14.	18.	15.8	-2.1	2.1
1522	14.	18.	15.8	-2.3	2.3
1523	13.	17.	15.1	-2.0	2.0
1524	14.	19.	16.4	-2.4	2.4
1525	16.	22.	18.9	-3.0	3.0
1526	18.	24.	21.0	-3.3	3.3
1527	19.	26.	22.6	-3.9	3.9
1528	19.	28.	23.6	-4.5	4.5
1529	19.	29.	23.9	-4.7	4.7
1530	19.	27.	22.9	-4.4	4.4
1531	18.	25.	21.5	-3.1	3.1
1532	18.	24.	20.6	-3.1	3.1
1533	17.	22.	19.4	-2.7	2.7
1534	16.	20.	17.9	-2.3	2.3
1535	15.	19.	17.1	-2.3	2.3
1536	14.	20.	16.9	-2.7	2.7
1537	13.	20.	16.4	-3.9	3.9
1538	11.	19.	15.[illegible]	-3.5	3.5
1539	12.	18.	14.9	-3.2	3.2
1540	13.	20.	16.6	-3.9	3.9
1541	14.	24.	19.1	-4.7	4.7
1542	16.	26.	20.9	-5.1	5.1
1543	18.	28.	22.9	-5.4	5.4
1544	18.	31.	23.9	-5.7	5.7
1545	19.	30.	24.4	-5.6	5.6

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1546	19.	29.	23.8	-5.1	5.0
1547	19.	27.	22.7	-4.0	4.0
1548	19.	25.	22.3	-3.1	3.1
1549	19.	24.	21.7	-2.3	2.3
1550	20.	24.	21.6	-1.9	1.9
1551	20.	24.	22.[illegible]	-2.1	2.0
1552	21.	24.	22.7	-1.5	1.5
1553	22.	25.	23.4	-1.6	1.6
1554	21.	25.	23.1	-1.9	1.9
1555	-0.	-0.	-.[illegible]	0.0	0.0
1556	-0.	-0.	-.[illegible]	0.0	0.[illegible]
1557	-0.	-0.	-.[illegible]	0.0	0.0
1558	-0.	-0.	-.[illegible]	0.0	0.0
1559	-0.	-0.	-.[illegible]	0.0	0.0
1600	-0.	-0.	-.[illegible]	0.0	0.0
1601	-0.	-0.	-.[illegible]	0.0	0.0
1602	-0.	-0.	-.[illegible]	0.0	0.0
1603	-0.	-0.	-.[illegible]	0.0	0.0
1604	-0.	-0.	-.[illegible]	0.0	0.0
1605	-0.	-0.	-.[illegible]	0.0	0.0
1606	-0.	-0.	-.[illegible]	0.0	0.0
1607	-0.	-0.	-.[illegible]	0.0	0.0
1608	25.	35.	30.0	-5.0	5.0
1609	21.	33.	26.9	-5.6	5.6
1610	19.	30.	24.4	-5.6	5.6
1611	17.	28.	22.2	-5.3	5.3
1612	16.	27.	21.4	-5.6	5.6
1613	16.	27.	21.4	-5.3	5.3
1614	16.	25.	20.4	-4.8	4.8
1615	15.	24.	19.4	-4.6	4.6
1616	15.	23.	19.1	-4.1	4.1
1617	15.	23.	19.4	-4.0	4.0
1618	16.	23.	19.5	-3.9	3.9
1619	15.	23.	19.3	-4.1	4.1
1620	14.	23.	18.4	-4.5	4.5
1621	16.	23.	19.6	-3.7	3.8
1622	18.	23.	20.4	-2.9	2.9
1623	17.	23.	20.[illegible]	-2.7	2.7
1624	18.	22.	19.8	-2.3	2.3
1625	18.	22.	19.9	-2.0	2.0
1626	19.	22.	20.6	-1.7	1.7
1627	20.	23.	21.4	-1.8	1.8
1628	20.	25.	22.6	-2.2	2.2
1629	24.	27.	25.4	-1.7	1.7
1630	26.	28.	27.2	-.9	.9
1631	28.	29.	28.6	-.3	.3

RUN NO 2 (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1632	30.	30.	29.6	.4	.4
1633	30.	30.	30.1	-.1	.1
1634	31.	33.	32.7	-1.7	1.7
1635	30.	33.	32.1	-2.1	2.1
1636	31.	33.	32.5	-1.5	1.5
1637	31.	30.	30.6	.4	-.4
1638	32.	29.	30.4	1.6	-1.6
1639	26.	26.	26.2	-.3	.3
1640	20.	23.	21.7	-1.4	1.4
1641	16.	21.	18.3	-2.3	2.3
1642	13.	18.	15.4	-2.9	2.9
1643	14.	16.	14.9	-1.1	1.1
1644	14.	14.	14.0	-.1	.1
1645	16.	14.	15.2	.9	-.9
1646	18.	15.	16.2	1.3	-1.3
1647	17.	14.	15.7	1.4	-1.4
1648	17.	14.	15.3	1.4	-1.4
1649	15.	13.	14.3	.9	-.9
1650	15.	14.	14.4	.4	-.4
1651	13.	14.	13.6	-.3	.3
1652	13.	14.	13.6	-.7	.7
1653	13.	15.	14.2	-.8	.8
1654	13.	15.	14.1	-.8	.8
1655	15.	17.	15.7	-.9	.9
1656	16.	19.	17.9	-1.5	1.5
1657	19.	22.	20.6	-1.7	1.7
1658	21.	25.	23.0	-2.0	2.0
1659	24.	28.	25.9	-2.2	2.2
1700	27.	31.	29.0	-2.3	2.3
1701	28.	32.	29.9	-1.8	1.8
1702	29.	31.	30.4	-1.0	1.0
1703	30.	31.	30.7	-.7	.7
1704	31.	32.	31.7	-.4	.4
1705	32.	32.	31.6	.1	.1
1706	32.	32.	31.7	.2	.2
1707	33.	34.	33.1	-.6	.6
1708	34.	36.	34.7	-.9	.9
1709	35.	38.	36.5	-1.2	1.2
1710	-0.	-0.	-.0	0.0	0.0
1711	-0.	-0.	-.0	0.0	0.0
1712	-0.	-0.	-.0	0.0	0.0
1713	-0.	-0.	-.0	0.0	0.0
1714	-0.	-0.	-.0	0.0	0.0
1715	-0.	-0.	-.0	0.0	0.0
1716	-0.	-0.	-.0	0.0	0.0
1717	-0.	-0.	-.0	0.0	0.0

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1718	-0.	-0.	-.0	0.0	0.0
1719	-0.	-0.	-.0	0.0	0.0
1720	-0.	-0.	-.0	0.0	0.0
1721	16.	21.	18.8	-2.5	2.5
1722	18.	23.	20.6	-2.5	2.5
1723	19.	24.	21.5	-2.3	2.3
1724	19.	25.	21.9	-2.8	2.8
1725	19.	25.	22.3	-3.3	3.3
1726	19.	26.	22.5	-3.3	3.3
1727	20.	27.	23.5	-3.1	3.1
1728	20.	26.	23.4	-3.3	3.3
1729	20.	27.	23.2	-3.4	3.4
1730	19.	26.	22.3	-3.3	3.3
1731	18.	24.	21.3	-3.3	3.3
1732	16.	22.	19.2	-2.9	2.9
1733	14.	20.	16.8	-3.3	3.3
1734	13.	18.	15.3	-2.8	2.8
1735	12.	17.	14.5	-2.4	2.4
1736	12.	16.	14.2	-1.7	1.7
1737	13.	15.	13.6	-1.1	1.1
1738	13.	14.	13.2	-.7	.7
1739	13.	14.	13.4	-.2	.2
1740	14.	14.	13.9	.1	-.1
1741	14.	13.	13.6	.4	-.4
1742	14.	14.	14.0	-.0	.0
1743	15.	15.	14.7	-.1	.1
1744	16.	16.	16.1	.1	-.1
1745	17.	17.	16.9	-.3	.3
1746	17.	19.	17.9	-.8	.8
1747	18.	20.	19.0	-1.1	1.1
1748	19.	20.	19.4	-.7	.7
1749	19.	20.	19.9	-.5	.5
1750	19.	21.	20.2	-.8	.8
1751	20.	22.	20.8	-.8	.8
1752	20.	21.	20.5	-.5	.5
1753	20.	20.	20.0	-.0	.0
1754	20.	21.	20.3	-.3	.3
1755	20.	21.	20.6	-.6	.6
1756	-0.	-0.	-.0	0.0	0.0
1757	-0.	-0.	-.0	0.0	0.0
1758	-0.	-0.	-.0	0.0	0.0
1759	-0.	-0.	-.0	0.0	0.0
1800	-0.	-0.	-.0	0.0	0.0
1801	-0.	-0.	-.0	0.0	0.0
1802	-0.	-0.	-.0	0.0	0.0
1803	-0.	-0.	-.0	0.0	0.0

RUN NO 2 (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1804	-0.	-0.	-.0	0.0	0.0
1805	-0.	-0.	-.0	0.0	0.0
1806	-0.	-0.	-.0	0.0	0.0
1807	-0.	-0.	-.0	0.0	0.0
1808	-0.	-0.	-.0	0.0	0.0
1809	-0.	-0.	-.0	0.0	0.0
1810	-0.	-0.	-.0	0.0	0.0
1811	-0.	-0.	-.0	0.0	0.0
1812	-0.	-0.	-.0	0.0	0.0
1813	-0.	-0.	-.0	0.0	0.0
1814	-0.	-0.	-.0	0.0	0.0
1815	-0.	-0.	-.0	0.0	0.0
1816	-0.	-0.	-.0	0.0	0.0
1817	-0.	-0.	-.0	0.0	0.0
1818	-0.	-0.	-.0	0.0	0.0
1819	-0.	-0.	-.0	0.0	0.0
1820	-0.	-0.	-.0	0.0	0.0
1821	-0.	-0.	-.0	0.0	0.0
1822	-0.	-0.	-.0	0.0	0.0
1823	-0.	-0.	-.0	0.0	0.0
1824	-0.	-0.	-.0	0.0	0.0
1825	-0.	-0.	-.0	0.0	0.0
1826	-0.	-0.	-.0	0.0	0.0
1827	-0.	-0.	-.0	0.0	0.0
1828	-0.	-0.	-.0	0.0	0.0
1829	-0.	-0.	-.0	0.0	0.0
1830	-0.	-0.	-.0	0.0	0.0
1831	-0.	-0.	-.0	0.0	0.0
1832	-0.	-0.	-.0	0.0	0.0
1833	-0.	-0.	-.0	0.0	0.0
1834	-0.	-0.	-.0	0.0	0.0
1835	-0.	-0.	-.0	0.0	0.0
1836	-0.	-0.	-.0	0.0	0.0
1837	-0.	-0.	-.0	0.0	0.0
1838	-0.	-0.	-.0	0.0	0.0
1839	-0.	-0.	-.0	0.0	0.0
1840	-0.	-0.	-.0	0.0	0.0
1841	-0.	-0.	-.0	0.0	0.0
1842	-0.	-0.	-.0	0.0	0.0
1843	-0.	-0.	-.0	0.0	0.0
1844	-0.	-0.	-.0	0.0	0.0

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 3A
DATE: 6/20/75

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
940	24.	23.	23.1	.6	-.6
941	24.	23.	23.3	.8	-.8
942	24.	23.	23.5	.5	-.5
943	24.	21.	22.7	1.5	-1.5
944	25.	21.	22.9	1.7	-1.7
945	25.	21.	23.3	2.1	-2.1
946	26.	21.	23.7	2.8	-2.8
947	26.	21.	23.5	2.8	-2.8
948	28.	21.	24.6	3.3	-3.3
949	29.	22.	25.1	3.4	-3.4
950	28.	22.	25.1	3.2	-3.2
951	28.	21.	24.7	3.2	-3.2
952	28.	21.	24.9	3.4	-3.4
953	30.	21.	25.6	4.2	-4.2
954	29.	21.	25.0	4.0	-4.0
955	28.	21.	24.4	3.3	-3.3
956	27.	21.	23.8	2.9	-2.9
957	24.	21.	22.8	1.6	-1.6
958	21.	22.	21.4	-.3	.3
959	18.	22.	19.7	-2.2	2.2
1000	16.	22.	18.9	-3.1	3.1
1001	14.	22.	17.8	-4.1	4.1
1002	12.	22.	16.9	-5.2	5.2
1003	11.	22.	16.3	-5.6	5.6
1004	11.	21.	16.3	-5.0	5.0
1005	-0.	-0.	-.0	0.0	0.0
1006	-0.	-0.	-.0	0.0	0.0
1007	-0.	-0.	-.0	0.0	0.0
1008	-0.	-0.	-.0	0.0	0.0
1009	-0.	-0.	-.0	0.0	0.0
1010	-0.	-0.	-.0	0.0	0.0
1011	-0.	-0.	-.0	0.0	0.0
1012	-0.	-0.	-.0	0.0	0.0
1013	-0.	-0.	-.0	0.0	0.0
1014	-0.	-0.	-.0	0.0	0.0
1015	-0.	-0.	-.0	0.0	0.0

RUN NO 3A (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLOHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLOHR	OBSERVER DEVIATION SNYDR
1016	-0.	-0.	-.0	0.0	0.0
1017	-0.	-0.	-.0	0.0	0.0
1018	-0.	-0.	-.0	0.0	0.0
1019	-0.	-0.	-.0	0.0	0.0
1020	-0.	-0.	-.0	0.0	0.0
1021	-0.	-0.	-.0	0.0	0.0
1022	-0.	-0.	-.0	0.0	0.0
1023	-0.	-0.	-.0	0.0	0.0
1024	-0.	-0.	-.0	0.0	0.0
1025	-0.	-0.	-.0	0.0	0.0
1026	-0.	-0.	-.0	0.0	0.0
1027	-0.	-0.	-.0	0.0	0.0
1028	-0.	-0.	-.0	0.0	0.0
1029	-0.	-0.	-.0	0.0	0.0
1030	-0.	-0.	-.0	0.0	0.0
1031	-0.	-0.	-.0	0.0	0.0
1032	-0.	-0.	-.0	0.0	0.0
1033	-0.	-0.	-.0	0.0	0.0
1034	-0.	-0.	-.0	0.0	0.0
1035	-0.	-0.	-.0	0.0	0.0
1036	-0.	-0.	-.0	0.0	0.0
1037	-0.	-0.	-.0	0.0	0.0
1038	-0.	-0.	-.0	0.0	0.0
1039	-0.	-0.	-.0	0.0	0.0
1040	-0.	-0.	-.0	0.0	0.0
1041	-0.	-0.	-.0	0.0	0.0
1042	-0.	-0.	-.0	0.0	0.0
1043	-0.	-0.	-.0	0.0	0.0
1044	-0.	-0.	-.0	0.0	0.0
1045	-0.	-0.	-.0	0.0	0.0
1046	-0.	-0.	-.0	0.0	0.0
1047	-0.	-0.	-.0	0.0	0.0
1048	-0.	-0.	-.0	0.0	0.0
1049	-0.	-0.	-.0	0.0	0.0
1050	-0.	-0.	-.0	0.0	0.0
1051	-0.	-0.	-.0	0.0	0.0
1052	-0.	-0.	-.0	0.0	0.0
1053	-0.	-0.	-.0	0.0	0.0
1054	-0.	-0.	-.0	0.0	0.0
1055	43.	20.	31.3	11.3	-11.3
1056	41.	19.	30.3	10.9	-10.9
1057	41.	18.	29.6	11.3	-11.3
1058	40.	18.	29.1	10.6	-10.6
1059	38.	19.	28.4	9.6	-9.6
1100	37.	19.	28.1	8.6	-8.6
1101	34.	19.	26.6	7.6	-7.6

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLOHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLOHR	OBSERVER DEVIATION SNYDR
1102	32.	19.	25.3	6.3	-6.6
1103	31.	19.	25.1	5.4	-5.8
1104	31.	19.	25.2	5.6	-5.6
1105	31.	19.	25.1	5.7	-5.7
1106	32.	20.	25.6	6.1	-6.1
1107	33.	21.	26.8	5.7	-5.7
1108	34.	22.	27.8	5.7	-5.7
1109	33.	22.	27.5	5.4	-5.4
1110	33.	22.	27.2	5.7	-5.7
1111	33.	22.	27.2	5.7	-5.7
1112	33.	21.	27.2	5.3	-5.9
1113	34.	21.	27.4	6.5	-6.5
1114	34.	20.	27.2	6.7	-6.7
1115	35.	20.	28.	7.5	-7.5
1116	35.	21.	28.3	7.1	-7.1
1117	37.	21.	29.0	7.7	-7.7
1118	36.	21.	28.6	7.8	-7.8
1119	35.	21.	28.1	7.3	-7.3
1120	36.	21.	28.6	7.2	-7.2
1121	36.	23.	29.1	6.6	-6.6
1122	35.	22.	28.6	6.8	-6.8
1123	34.	21.	27.6	6.1	-6.1
1124	33.	21.	27.2	5.9	-5.9
1125	33.	21.	27.2	6.1	-6.1
1126	34.	21.	27.8	6.4	-6.4
1127	35.	22.	28.2	6.4	-6.4
1128	36.	24.	29.7	5.9	-5.9
1129	36.	25.	30.6	5.8	-5.8
1130	37.	25.	30.8	6.0	-6.0
1131	36.	24.	30.3	5.9	-5.9
1132	36.	24.	30.0	6.0	-6.0
1133	35.	24.	29.1	5.5	-5.5
1134	34.	22.	28.2	5.6	-5.6
1135	33.	22.	27.5	5.9	-5.9
1136	33.	22.	27.8	5.3	-5.3
1137	33.	23.	28.2	5.0	-5.0
1138	32.	23.	27.4	4.6	-4.6
1139	32.	22.	27.2	4.9	-4.9
1140	32.	23.	27.1	4.6	-4.6
1141	31.	24.	27.5	3.1	-3.1
1142	30.	26.	28.1	1.9	-1.9
1143	-0.	-0.	-.0	0.0	0.0
1144	-0.	-0.	-.0	0.0	0.0
1145	-0.	-0.	-.0	0.0	0.0
1146	-0.	-0.	-.0	0.0	0.0
1147	-0.	-0.	-.0	0.0	0.0

RUN NO 3A (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1148	-0.	-0.	-.	0.0	0.0
1149	-0.	-0.	-.	0.0	0.0
1150	-0.	-0.	-.	0.0	0.0
1151	-0.	-0.	-.	0.0	0.0
1152	-0.	-0.	-.0	0.0	0.0
1153	-0.	-0.	-.0	0.0	0.0
1154	-0.	-0.	-.0	0.0	0.0
1155	-0.	-0.	-.0	0.0	0.0
1156	-0.	-0.	-.0	0.0	0.0
1157	-0.	-0.	-.0	0.0	0.0
1158	-0.	-0.	-.0	0.0	0.0
1159	-0.	-0.	-.0	0.0	0.0
1200	20.	24.	21.9	-1.9	1.9
1201	21.	24.	22.5	-1.2	1.2
1202	23.	24.	23.1	-.6	.6
1203	23.	23.	22.8	-.3	.3
1204	22.	23.	22.4	-.1	.1
1205	21.	23.	22.0	-.7	.7
1206	21.	22.	21.8	-.5	.5
1207	21.	22.	21.5	-.6	.6
1208	20.	21.	20.7	-.3	.3
1209	20.	22.	21.0	-.8	.8
1210	20.	23.	21.6	-1.4	1.4
1211	22.	24.	23.0	-.7	.7
1212	24.	24.	23.8	-.3	.3
1213	25.	24.	24.4	.4	-.4
1214	26.	26.	25.8	.2	-.2
1215	28.	25.	26.2	1.3	-1.3
1216	30.	25.	27.3	2.5	-2.5
1217	31.	24.	27.8	3.5	-3.5
1218	32.	24.	28.0	3.6	-3.6
1219	33.	25.	28.8	4.1	-4.0
1220	34.	26.	29.8	4.2	-4.2
1221	35.	26.	30.4	4.4	-4.4
1222	35.	26.	30.3	4.5	-4.5
1223	34.	25.	29.4	4.4	-4.4
1224	34.	24.	29.1	4.7	-4.7
1225	35.	24.	29.1	5.5	-5.5
1226	35.	22.	28.3	6.5	-6.5
1227	35.	21.	28.1	7.1	-7.1
1228	36.	20.	28.1	7.9	-7.9
1229	38.	21.	29.3	8.2	-8.2
1230	39.	21.	29.8	9.0	-9.0
1231	38.	21.	29.3	8.6	-8.6
1232	37.	21.	28.9	8.0	-8.0
1233	36.	21.	28.8	7.7	-7.7

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1234	36.	21.	28.6	7.4	-7.4
1235	36.	20.	28.2	7.8	-7.8
1236	36.	20.	27.9	7.9	-7.9
1237	37.	21.	28.7	8.0	-8.0
1238	37.	20.	28.7	8.4	-8.4
1239	36.	20.	28.1	8.4	-8.4
1240	35.	17.	26.2	8.8	-8.8
1241	32.	16.	24.1	7.7	-7.7
1242	29.	16.	22.6	6.4	-6.4
1243	27.	14.	20.7	6.3	-6.3
1244	25.	13.	19.0	6.0	-6.0
1245	23.	11.	16.8	6.1	-6.1
1246	20.	14.	16.9	3.1	-3.1
1247	19.	-0.	9.4	9.4	-9.4
1248	-0.	-0.	-.0	0.0	0.0
1249	-0.	-0.	-.0	0.0	0.0
1250	-0.	-0.	-.	0.0	0.0
1251	-0.	-0.	-.0	0.0	0.0
1252	-0.	-0.	-.0	0.0	0.0
1253	-0.	-0.	-.0	0.0	0.0
1254	-0.	-0.	-.0	0.0	0.0

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 3B
DATE: 6/20/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

TIME	OBSERVED PATH LENGTH AVERAGE OPACITY PLCHR	SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	SNYDR
1504	15.	24.	19.3	-4.3	4.3
1505	15.	24.	19.3	-4.3	4.3
1506	15.	24.	19.5	-4.5	4.5
1507	15.	24.	19.7	-4.7	4.7
1508	15.	24.	19.4	-4.4	4.4
1509	15.	23.	18.9	-3.9	3.9
1510	15.	23.	18.9	-3.9	3.9
1511	15.	24.	19.3	-4.3	4.3
1512	15.	23.	18.9	-3.9	3.9
1513	15.	22.	18.5	-3.5	3.5
1514	15.	21.	18.2	-3.2	3.2
1515	15.	21.	17.9	-2.8	2.8
1516	15.	21.	17.9	-2.9	2.9
1517	14.	20.	16.9	-2.7	2.7
1518	14.	20.	17.[illegible]	-3.2	3.2
1519	14.	20.	16.9	-3.1	3.1
1520	14.	21.	17.2	-3.4	3.4
1521	14.	21.	17.5	-3.7	3.7
1522	14.	20.	17.1	-3.3	3.3
1523	15.	20.	17.4	-2.8	2.8
1524	15.	23.	17.3	-2.2	2.2
1525	15.	20.	17.3	-2.3	2.3
1526	15.	19.	17.1	-2.1	2.1
1527	15.	19.	16.9	-1.9	1.9
1528	15.	19.	16.9	-1.9	1.9
1529	15.	-0.	7.5	7.5	-7.5
1530	15.	-0.	7.5	7.5	-7.5
1531	15.	-0.	7.5	7.5	-7.5
1532	15.	-0.	7.5	7.5	-7.5
1533	-0.	-0.	-.[illegible]	0.0	0.0
1534	-0.	-0.	-.[illegible]	0.0	0.0
1535	-0.	-0.	-.[illegible]	0.0	0.0
1536	-0.	-0.	-.[illegible]	0.0	0.0
1537	-0.	-0.	-.[illegible]	0.0	0.0
1538	-0.	-0.	-.[illegible]	0.0	0.0
1539	-0.	-0.	-.[illegible]	0.0	0.0

TIME	OBSERVED PATH LENGTH AVERAGE OPACITY PLCHR	SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	SNYDR
1540	-0.	-0.	-.[illegible]	0.0	0.0
1541	-0.	-0.	-.[illegible]	0.0	0.0
1542	-0.	-0.	-.[illegible]	0.0	0.0
1543	-0.	-0.	-.[illegible]	0.0	0.0
1544	-0.	-0.	-.[illegible]	0.0	0.0
1545	-0.	-0.	-.[illegible]	0.0	0.0
1546	-0.	-0.	-.[illegible]	0.0	0.0
1547	-0.	-0.	-.[illegible]	0.0	0.0
1548	-0.	-0.	-.[illegible]	0.0	0.0
1549	-0.	-0.	-.[illegible]	0.0	0.0
1550	-0.	-0.	-.[illegible]	0.0	0.0
1551	-0.	-0.	-.[illegible]	0.0	0.0
1552	-0.	-0.	-.[illegible]	0.0	0.0
1553	-0.	-0.	-.[illegible]	0.0	0.0
1554	-0.	-0.	-.[illegible]	0.0	0.0
1555	-0.	-0.	-.[illegible]	0.0	0.0
1556	-0.	-0.	-.[illegible]	0.0	0.0
1557	-0.	-0.	-.[illegible]	0.0	0.0
1558	-0.	-0.	-.[illegible]	0.0	0.0
1559	-0.	-0.	-.[illegible]	0.0	0.0
1600	-0.	-0.	-.[illegible]	0.0	0.0
1601	-0.	-0.	-.[illegible]	0.0	0.0
1602	-0.	-0.	-.[illegible]	0.0	0.0
1603	-0.	-0.	-.[illegible]	0.0	0.0
1604	-0.	-0.	-.[illegible]	0.0	0.0
1605	-0.	-0.	-.[illegible]	0.0	0.0
1606	-0.	-0.	-.[illegible]	0.0	0.0
1607	-0.	-0.	-.[illegible]	0.0	0.0
1608	-0.	-0.	-.[illegible]	0.0	0.0
1609	-0.	-0.	-.[illegible]	0.0	0.0
1610	-0.	-0.	-.[illegible]	0.0	0.0
1611	-0.	-0.	-.[illegible]	0.0	0.0
1612	-0.	-0.	-.[illegible]	0.0	0.0
1613	-0.	-0.	-.[illegible]	0.0	0.0
1614	-0.	-0.	-.[illegible]	0.0	0.0
1615	-0.	-0.	-.[illegible]	0.0	0.0
1616	-0.	-0.	-.[illegible]	0.0	0.0
1617	-0.	-0.	-.[illegible]	0.0	0.0
1618	-0.	-0.	-.[illegible]	0.0	0.0
1619	-0.	-0.	-.[illegible]	0.0	0.0
1620	-0.	-0.	-.[illegible]	0.0	0.0
1621	-0.	-0.	-.[illegible]	0.0	0.0
1622	-0.	-0.	-.[illegible]	0.0	0.0

RUN 3B (CONTINUED)

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1606	10.	14.	12.2	-2.0	2.0
1607	10.	15.	12.4	-2.2	2.2
1608	10.	15.	12.4	-2.2	2.2
1609	10.	14.	12.2	-2.0	2.0
1610	10.	14.	12.1	-1.9	1.9
1611	10.	13.	11.6	-1.6	1.6
1612	10.	13.	11.6	-1.6	1.6
1613	10.	13.	11.9	-1.5	1.5
1614	11.	14.	12.7	-1.5	1.5
1615	12.	15.	13.6	-1.6	1.6
1616	13.	16.	14.2	-1.5	1.5
1617	13.	16.	14.9	-1.7	1.7
1618	14.	17.	15.2	-1.7	1.7
1619	13.	15.	15.3	-2.2	2.2
1620	12.	18.	15.0	-2.7	2.7
1621	12.	18.	14.9	-3.0	3.0
1622	11.	18.	14.8	-3.5	3.5
1623	11.	19.	14.7	-3.9	3.9
1624	10.	18.	14.4	-4.0	4.0
1625	10.	18.	14.2	-3.8	3.8
1626	10.	17.	13.9	-3.4	3.4
1627	10.	16.	13.2	-3.2	3.2
1628	10.	16.	13.0	-3.0	3.0
1629	10.	15.	12.4	-2.4	2.4
1630	10.	14.	12.2	-2.2	2.2
1631	11.	14.	12.5	-1.7	1.7
1632	12.	14.	12.9	-1.3	1.3
1633	12.	14.	12.7	-1.0	1.0
1634	12.	14.	12.6	-.9	.9
1635	12.	14.	12.9	-1.3	1.3
1636	12.	15.	13.1	-1.5	1.5
1637	11.	14.	12.6	-1.8	1.8
1638	11.	14.	12.4	-1.6	1.6
1639	11.	14.	12.6	-1.8	1.8
1640	11.	14.	12.7	-1.5	1.5
1641	12.	13.	12.5	-.8	.8
1642	12.	13.	12.4	-.7	.7
1643	12.	12.	11.8	-.1	.1
1644	11.	11.	10.8	0.0	0.0
1645	11.	9.	10.1	.7	-.7
1646	10.	8.	9.3	1.1	-1.1
1647	9.	8.	8.3	.8	-.8
1648	9.	6.	7.4	1.4	-1.4
1649	9.	6.	7.4	1.4	-1.4
1650	9.	6.	7.3	1.3	-1.3
1651	8.	6.	7.0	1.1	-1.1

PLANT: WESTMORELAND COAL CO
LOCATION: DUNWOOD W VIRGINIA
EPA TEST: RUN NO 4
DATE: 6/23/75

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1530	-0.	-0.	-.0	0.0	0.0
1531	-0.	-0.	-.0	0.0	0.0
1532	-0.	-0.	-.0	0.0	0.0
1533	-0.	-0.	-.0	0.0	0.0
1534	-0.	-0.	-.0	0.0	0.0
1535	-0.	-0.	-.0	0.0	0.0
1536	-0.	-0.	-.0	0.0	0.0
1537	-0.	-0.	-.0	0.0	0.0
1538	-0.	-0.	-.0	0.0	0.0
1539	-0.	-0.	-.0	0.0	0.0
1540	-0.	-0.	-.0	0.0	0.0
1541	-0.	-0.	-.0	0.0	0.0
1542	-0.	-0.	-.0	0.0	0.0
1543	-0.	-0.	-.0	0.0	0.0
1544	-0.	-0.	-.0	0.0	0.0
1545	-0.	-0.	-.0	0.0	0.0
1546	15.	13.	13.8	1.3	-1.3
1547	16.	13.	14.7	1.6	-1.6
1548	17.	13.	15.0	1.7	-1.7
1549	17.	13.	15.0	1.9	-1.9
1550	17.	14.	15.0	1.5	-1.5
1551	16.	14.	15.1	.7	-.7
1552	16.	15.	15.1	.5	-.5
1553	14.	15.	14.6	-.2	.2
1554	14.	16.	15.1	-1.1	1.1
1555	14.	17.	15.2	-1.7	1.7
1556	14.	17.	15.1	-1.6	1.6
1557	14.	15.	14.5	-.9	.9
1558	13.	13.	14.0	-1.0	1.0
1559	13.	15.	13.9	-.9	.9
1600	12.	14.	12.8	-.7	.7
1601	11.	13.	12.0	-.7	.7
1602	10.	13.	11.5	-1.0	1.0
1603	10.	13.	11.6	-1.6	1.6
1604	10.	14.	11.9	-1.9	1.9
1605	10.	14.	12.3	-2.1	2.1

RUN NO 4 (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1652	8.	5.	6.7	.8	-.8
1653	9.	6.	7.2	1.6	-1.6
1654	10.	6.	8.1	1.9	-1.9
1655	-0.	-0.	-.0	0.0	0.0
1656	-0.	-0.	-.0	0.0	0.0
1657	-0.	-0.	-.0	0.0	0.0
1658	-0.	-0.	-.0	0.0	0.0
1659	-0.	-0.	-.0	0.0	0.0
1700	-0.	-0.	-.0	0.0	0.0
1701	-0.	-0.	-.0	0.0	0.0
1702	-0.	-0.	-.0	0.0	0.0
1703	-0.	-0.	-.0	0.0	0.0
1704	-0.	-0.	-.0	0.0	0.0
1705	-0.	-0.	-.0	0.0	0.0
1706	-0.	-0.	-.0	0.0	0.0
1707	-0.	-0.	-.0	0.0	0.0
1708	-0.	-0.	-.0	0.0	0.0
1709	-0.	-0.	-.0	0.0	0.0
1710	-0.	-0.	-.0	0.0	0.0
1711	-0.	-0.	-.0	0.0	0.0
1712	-0.	-0.	-.0	0.0	0.0
1713	-0.	-0.	-.0	0.0	0.0
1714	-0.	-0.	-.0	0.0	0.0
1715	-0.	-0.	-.0	0.0	0.0
1716	-0.	-0.	-.0	0.0	0.0
1717	-0.	-0.	-.0	0.0	0.0
1718	-0.	-0.	-.0	0.0	0.0
1719	-0.	-0.	-.0	0.0	0.0
1720	-0.	-0.	-.0	0.0	0.0
1721	-0.	-0.	-.0	0.0	0.0
1722	-0.	-0.	-.0	0.0	0.0
1723	-0.	-0.	-.0	0.0	0.0
1724	-0.	-0.	-.0	0.0	0.0
1725	-0.	-0.	-.0	0.0	0.0
1726	-0.	-0.	-.0	0.0	0.0
1727	-0.	-0.	-.0	0.0	0.0
1728	-0.	-0.	-.0	0.0	0.0
1729	-0.	-0.	-.0	0.0	0.0
1730	-0.	-0.	-.0	0.0	0.0
1731	-0.	-0.	-.0	0.0	0.0
1732	-0.	-0.	-.0	0.0	0.0
1733	-0.	-0.	-.0	0.0	0.0
1734	-0.	-0.	-.0	0.0	0.0
1735	-0.	-0.	-.0	0.0	0.0
1736	-0.	-0.	-.0	0.0	0.0
1737	-0.	-0.	-.0	0.0	0.0

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1738	-0.	-0.	-.0	0.0	0.0
1739	-0.	-0.	-.0	0.0	0.0
1740	-0.	-0.	-.0	0.0	0.0
1741	-0.	-0.	-.0	0.0	0.0
1742	-0.	-0.	-.0	0.0	0.0
1743	-0.	-0.	-.0	0.0	0.0
1744	-0.	-0.	-.0	0.0	0.0
1745	-0.	-0.	-.0	0.0	0.0
1746	-0.	-0.	-.0	0.0	0.0
1747	-0.	-0.	-.0	0.0	0.0
1748	-0.	-0.	-.0	0.0	0.0
1749	-0.	-0.	-.0	0.0	0.0
1750	-0.	-0.	-.0	0.0	0.0
1751	-0.	-0.	-.0	0.0	0.0
1752	-0.	-0.	-.0	0.0	0.0
1753	-0.	-0.	-.0	0.0	0.0
1754	-0.	-0.	-.0	0.0	0.0
1755	-0.	-0.	-.0	0.0	0.0
1756	-0.	-0.	-.0	0.0	0.0
1757	-0.	-0.	-.0	0.0	0.0
1758	-0.	-0.	-.0	0.0	0.0
1759	-0.	-0.	-.0	0.0	0.0
1800	-0.	-0.	-.0	0.0	0.0
1801	-0.	-0.	-.0	0.0	0.0
1802	-0.	-0.	-.0	0.0	0.0
1803	-0.	-0.	-.0	0.0	0.0
1804	-0.	-0.	-.0	0.0	0.0
1805	10.	10.	10.0	0.0	0.0
1806	10.	10.	10.0	0.0	0.0
1807	10.	10.	10.0	0.0	0.0
1808	10.	10.	10.0	0.0	0.0
1809	10.	10.	10.0	0.0	0.0
1810	10.	10.	10.0	0.0	0.0
1811	10.	10.	10.0	0.0	0.0
1812	10.	10.	10.0	0.0	0.0
1813	10.	10.	10.0	0.0	0.0
1814	10.	10.	10.0	0.0	0.0
1815	10.	10.	10.0	0.0	0.0
1816	10.	10.	10.0	0.0	0.0
1817	10.	10.	10.0	0.0	0.0
1818	10.	10.	10.0	0.0	0.0
1819	10.	10.	10.0	0.0	0.0
1820	10.	10.	10.2	-.2	.2
1821	10.	11.	10.3	-.3	.3
1822	10.	11.	10.3	-.3	.3
1823	10.	11.	10.3	-.3	.3

RUN NO 4 (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
824	10.	11.	10.3	-.3	.3
825	10.	11.	10.5	-.5	.5
826	10.	11.	10.6	-.6	.6
827	10.	11.	10.7	-.7	.7
828	10.	12.	10.9	-.9	.9
829	10.	12.	10.9	-.9	.9
830	10.	13.	11.4	-1.4	1.4
831	10.	13.	11.4	-1.4	1.4
832	10.	12.	11.0	-1.0	1.0
833	10.	12.	10.8	-.8	.8
834	10.	11.	10.6	-.6	.6
835	10.	12.	10.9	-.9	.9
836	10.	11.	10.5	-.5	.5
837	10.	11.	10.3	-.3	.3
838	10.	11.	10.5	-.5	.5
839	11.	12.	11.3	-.6	.6
840	11.	13.	12.1	-.6	.6
841	12.	13.	12.6	-.3	.3
842	13.	14.	13.4	-.3	.3
843	14.	15.	14.5	-.5	.5
844	15.	15.	15.4	-.6	.6
845	15.	17.	15.9	-.9	.9
846	15.	18.	16.4	-1.4	1.4
847	15.	18.	16.4	-1.4	1.4
848	15.	18.	16.4	-1.4	1.4
849	15.	18.	16.5	-1.5	1.5
850	15.	19.	16.8	-1.8	1.8
851	15.	19.	17.1	-2.1	2.1
852	15.	19.	17.1	-2.1	2.1
853	15.	20.	17.5	-2.5	2.5
854	15.	21.	17.9	-2.9	2.9
855	15.	21.	17.8	-2.8	2.8
856	15.	20.	17.3	-2.3	2.3
857	15.	18.	16.6	-1.6	1.6
858	15.	17.	16.1	-1.1	1.1
859	15.	16.	15.6	-.6	.6
900	15.	15.	15.1	-.1	.1
901	15.	15.	14.9	.1	-.1
902	15.	15.	14.8	.2	-.2
903	15.	15.	14.8	.2	-.2
904	15.	15.	14.8	.2	-.2
905	15.	15.	14.9	.1	-.1
906	15.	15.	15.0	0.0	0.0
907	15.	15.	15.0	0.0	0.0
908	14.	15.	14.6	-.4	.4
909	13.	15.	14.2	-.8	.8

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1910	13.	15.	13.4	-1.3	1.3
1911	12.	15.	13.1	-1.5	1.5
1912	11.	14.	12.5	-1.7	1.7
1913	10.	14.	12.0	-2.0	2.0
1914	10.	14.	11.9	-1.9	1.9
1915	10.	13.	11.7	-1.7	1.7
1916	10.	13.	11.3	-1.3	1.3
1917	10.	13.	11.3	-1.3	1.3
1918	-0.	-0.	-.0	0.0	0.0
1919	-0.	-0.	-.0	0.0	0.0
1920	-0.	-0.	-.0	0.0	0.0
1921	-0.	-0.	-.0	0.0	0.0
1922	-0.	-0.	-.0	0.0	0.0
1923	-0.	-0.	-.0	0.0	0.0
1924	-0.	-0.	-.0	0.0	0.0

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 5A
DATE: 6/25/76

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLOHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLOHR	OBSERVER DEVIATION SNYDR
1034	-0.	-0.	-.0	0.0	0.0
1035	-0.	-0.	-.0	0.0	0.0
1036	-0.	-0.	-.0	0.0	0.0
1037	-0.	-0.	-.0	0.0	0.0
1038	-0.	-0.	-.0	0.0	0.0
1039	-0.	-0.	-.0	0.0	0.0
1040	-0.	-0.	-.0	0.0	0.0
1041	-0.	-0.	-.0	0.0	0.0
1042	-0.	-0.	-.0	0.0	0.0
1043	-0.	-0.	-.0	0.0	0.0
1044	-0.	-0.	-.0	0.0	0.0
1045	-0.	-0.	-.0	0.0	0.0
1046	-0.	-0.	-.0	0.0	0.0
1047	-0.	-0.	-.0	0.0	0.0
1048	-0.	-0.	-.0	0.0	0.0
1049	-0.	-0.	-.0	0.0	0.0
1050	-0.	-0.	-.0	0.0	0.0
1051	-0.	-0.	-.0	0.0	0.0
1052	-0.	-0.	-.0	0.0	0.0
1053	-0.	-0.	-.0	0.0	0.0
1054	-0.	-0.	-.0	0.0	0.0
1055	-0.	-0.	-.0	0.0	0.0
1056	-0.	-0.	-.0	0.0	0.0
1057	-0.	-0.	-.0	0.0	0.0
1058	-0.	-0.	-.0	0.0	0.0
1059	-0.	-0.	-.0	0.0	0.0
1100	-0.	-0.	-.0	0.0	0.0
1101	-0.	-0.	-.0	0.0	0.0
1102	-0.	-0.	-.0	0.0	0.0
1103	-0.	-0.	-.0	0.0	0.0
1104	-0.	-0.	-.0	0.0	0.0
1105	-0.	-0.	-.0	0.0	0.0
1106	-0.	-0.	-.0	0.0	0.0
1107	-0.	-0.	-.0	0.0	0.0
1108	-0.	-0.	-.0	0.0	0.0
1109	-0.	-0.	-.0	0.0	0.0
1110	-0.	-0.	-.0	0.0	0.0
1111	-0.	-0.	-.0	0.0	0.0
1112	-0.	15.	7.5	-7.5	7.5
1113	15.	15.	15.0	0.0	0.0
1114	13.	15.	13.8	-1.3	1.3
1115	12.	15.	13.3	-1.7	1.7
1116	13.	15.	13.8	-1.3	1.3
1117	13.	15.	14.0	-1.0	1.0
1118	13.	16.	14.5	-1.1	1.1
1119	13.	16.	14.9	-1.6	1.6
1120	14.	17.	15.5	-1.3	1.3
1121	15.	17.	16.1	-1.1	1.1
1122	15.	18.	16.5	-1.5	1.5
1123	15.	19.	17.2	-2.2	2.2
1124	15.	20.	17.5	-2.5	2.5
1125	16.	21.	18.5	-2.7	2.7

RUN NO 5A (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1125	16.	23.	19.5	-3.5	3.5
1127	16.	25.	21.4	-4.6	4.6
1128	16.	25.	21.5	-4.5	4.5
1129	16.	25.	20.6	-4.4	4.4
1130	17.	25.	20.9	-4.2	4.2
1131	15.	27.	20.9	-5.9	5.9
1132	15.	29.	21.9	-6.9	6.9
1133	-0.	-0.	-.-	0.0	0.0
1134	-0.	-0.	-.-	0.0	0.0
1135	-0.	-0.	-.-	0.0	0.0
1136	-0.	-0.	-.-	0.0	0.0
1137	-0.	-0.	-.-	0.0	0.0
1138	-0.	-0.	-.-	0.0	0.0
1139	-0.	-0.	-.-	0.0	0.0
1140	-0.	-0.	-.-	0.0	0.0
1141	-0.	-0.	-.-	0.0	0.0
1142	-0.	-0.	-.-	0.0	0.0
1143	-0.	-0.	-.-	0.0	0.0
1144	-0.	-0.	-.-	0.0	0.0
1145	-0.	-0.	-.-	0.0	0.0
1146	-0.	-0.	-.-	0.0	0.0
1147	-0.	-0.	-.-	0.0	0.0
1148	-0.	-0.	-.-	0.0	0.0
1149	-0.	-0.	-.-	0.0	0.0
1150	-0.	-0.	-.-	0.0	0.0
1151	-0.	-0.	-.-	0.0	0.0
1152	-0.	-0.	-.-	0.0	0.0
1153	-0.	-0.	-.-	0.0	0.0
1154	-0.	-0.	-.-	0.0	0.0
1155	-0.	-0.	-.-	0.0	0.0
1156	-0.	-0.	-.-	0.0	0.0
1157	-0.	-0.	-.-	0.0	0.0
1158	-0.	-0.	-.-	0.0	0.0
1159	-0.	-0.	-.-	0.0	0.0
1200	-0.	-0.	-.-	0.0	0.0
1201	-0.	-0.	-.-	0.0	0.0
1202	-0.	-0.	-.-	0.0	0.0
1203	-0.	-0.	-.-	0.0	0.0
1204	-0.	-0.	-.-	0.0	0.0
1205	-0.	-0.	-.-	0.0	0.0
1206	-0.	-0.	-.-	0.0	0.0
1207	-0.	-0.	-.-	0.0	0.0
1208	-0.	-0.	-.-	0.0	0.0
1209	-0.	-0.	-.-	0.0	0.0
1210	-0.	-0.	-.-	0.0	0.0
1211	-0.	-0.	-.-	0.0	0.0

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1212	-0.	-0.	-.-	0.0	0.0
1213	-0.	-0.	-.-	0.0	0.0
1214	-0.	-0.	-.-	0.0	0.0
1215	-0.	-0.	-.-	0.0	0.0
1216	-0.	-0.	-.-	0.0	0.0
1217	-0.	-0.	-.-	0.0	0.0
1218	-0.	-0.	-.-	0.0	0.0
1219	-0.	-0.	-.-	0.0	0.0
1220	20.	25.	22.5	-2.5	2.5
1221	21.	24.	22.8	-1.6	1.6
1222	21.	23.	22.1	-1.3	1.3
1223	21.	23.	21.7	-1.1	1.1
1224	22.	23.	22.1	-.6	.6
1225	21.	22.	21.8	-.5	.5
1226	20.	21.	20.7	-.7	.7
1227	18.	21.	19.6	-1.3	1.3
1228	17.	21.	18.9	-1.8	1.8
1229	16.	20.	18.4	-2.4	2.4
1230	13.	20.	16.7	-3.3	3.3
1231	13.	20.	16.3	-3.8	3.8
1232	13.	20.	16.6	-3.4	3.4
1233	14.	20.	16.8	-3.2	3.2
1234	14.	21.	17.2	-3.0	3.0
1235	16.	21.	18.2	-2.4	2.4
1236	18.	21.	19.5	-2.0	2.0
1237	18.	22.	20.3	-2.0	2.0
1238	19.	23.	21.1	-2.0	2.0
1239	20.	25.	22.5	-2.1	2.1
1240	21.	25.	23.0	-2.0	2.0
1241	22.	25.	23.4	-1.9	1.8
1242	22.	26.	24.0	-1.7	1.7
1243	24.	26.	24.9	-1.4	1.4
1244	25.	27.	25.7	-1.1	1.1
1245	25.	26.	25.3	-.7	.7
1246	25.	26.	25.5	-.7	.7
1247	24.	27.	25.5	-1.1	1.1
1248	24.	26.	24.7	-1.1	1.1
1249	22.	25.	23.6	-1.4	1.4
1250	20.	24.	22.4	-2.0	2.0
1251	20.	25.	22.1	-2.5	2.5
1252	20.	25.	22.4	-2.2	2.2
1253	20.	24.	22.1	-2.3	2.3
1254	20.	25.	22.6	-2.2	2.2
1255	21.	24.	22.7	-1.5	1.5
1256	23.	24.	23.1	-.4	.4
1257	24.	23.	23.5	.4	-.4

RUN NO 5A (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1258	24.	23.	23.4	.6	-.6
1259	24.	23.	23.3	.6	-.6
1300	25.	23.	23.6	.3	-.9
1301	24.	24.	24.1	.3	-.3
1302	23.	24.	23.6	-.3	.3
1303	23.	24.	23.6	-.7	.7
1304	23.	24.	23.6	-.7	.7
1305	24.	25.	24.3	-.5	.5
1306	23.	25.	24.[illegible]	-1.0	1.0
1307	23.	25.	25.9	-1.1	1.1
1308	24.	26.	24.9	-.7	.7
1309	25.	26.	25.3	-.3	.3
1310	25.	26.	25.6	-.6	.6
1311	-0.	26.	13.1	-13.1	13.1
1312	-0.	26.	13.1	-13.1	13.1
1313	-0.	-0.	-.[illegible]	0.0	0.0
1314	-0.	-0.	-.[illegible]	0.0	0.0
1315	-0.	-0.	-.[illegible]	0.0	0.0
1316	-0.	-0.	-.[illegible]	0.0	0.0
1317	-0.	-0.	-.[illegible]	0.0	0.0
1318	-0.	-0.	-.[illegible]	0.0	0.0
1319	-0.	-0.	-.[illegible]	0.0	0.0
1320	-0.	-0.	-.[illegible]	0.0	0.0
1321	-0.	-0.	-.[illegible]	0.0	0.0
1322	-0.	-0.	-.[illegible]	0.0	0.0
1323	-0.	-0.	-.[illegible]	0.0	0.0
1324	-0.	-0.	-.[illegible]	0.0	0.0
1325	-0.	-0.	-.[illegible]	0.0	0.0
1326	-0.	-0.	-.[illegible]	0.0	0.0
1327	-0.	-0.	-.[illegible]	0.0	0.0
1328	-0.	-0.	-.[illegible]	0.0	0.0
1329	-0.	-0.	-.[illegible]	0.0	0.0
1330	-0.	-0.	-.[illegible]	0.0	0.0
1331	-0.	-0.	-.[illegible]	0.0	0.0
1332	-0.	-0.	-.[illegible]	0.0	0.0
1333	-0.	-0.	-.[illegible]	0.0	0.0
1334	-0.	-0.	-.[illegible]	0.0	0.0
1335	-0.	-0.	-.[illegible]	0.0	0.0
1336	-0.	-0.	-.[illegible]	0.0	0.0
1337	-0.	-0.	-.[illegible]	0.0	0.0
1338	-0.	-0.	-.[illegible]	0.0	0.0
1339	-0.	-0.	-.[illegible]	0.0	0.0
1340	-0.	-0.	-.[illegible]	0.0	0.0
1341	-0.	-0.	-.[illegible]	0.0	0.0
1342	-0.	-0.	-.[illegible]	0.0	0.0
1343	-0.	-0.	-.[illegible]	0.0	0.0

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1344	-0.	-0.	-.[illegible]	0.0	0.0
1345	-0.	-0.	-.[illegible]	0.0	0.0
1346	-0.	-0.	-.[illegible]	0.0	0.0
1347	-0.	-0.	-.[illegible]	0.0	0.0
1348	-0.	-0.	-.[illegible]	0.0	0.0
1349	-0.	-0.	-.[illegible]	0.0	0.0
1350	-0.	-0.	-.[illegible]	0.0	0.0
1351	-0.	-0.	-.[illegible]	0.0	0.0
1352	-0.	-0.	-.[illegible]	0.0	0.0
1353	-0.	-0.	-.[illegible]	0.0	0.0
1354	-0.	-0.	-.[illegible]	0.0	0.0
1355	-0.	-0.	-.[illegible]	0.0	0.0
1356	-0.	-0.	-.[illegible]	0.0	0.0
1357	-0.	-0.	-.[illegible]	0.0	0.0
1358	-0.	-0.	-.[illegible]	0.0	0.0
1359	-0.	-0.	-.[illegible]	0.0	0.0
1400	-0.	-0.	-.[illegible]	0.0	0.0
1401	-0.	-0.	-.[illegible]	0.0	0.0
1402	-0.	-0.	-.[illegible]	0.0	0.0
1403	-0.	-0.	-.[illegible]	0.0	0.0
1404	-0.	-0.	-.[illegible]	0.0	0.0
1405	-0.	-0.	-.[illegible]	0.0	0.0
1406	-0.	-0.	-.[illegible]	0.0	0.0
1407	-0.	-0.	-.[illegible]	0.0	0.0
1408	-0.	-0.	-.[illegible]	0.0	0.0
1409	-0.	-0.	-.[illegible]	0.0	0.0
1410	-0.	-0.	-.[illegible]	0.0	0.0
1411	-0.	-0.	-.[illegible]	0.0	0.0
1412	-0.	-0.	-.[illegible]	0.0	0.0
1413	-0.	-0.	-.[illegible]	0.0	0.0
1414	-0.	-0.	-.[illegible]	0.0	0.0
1415	-0.	-0.	-.[illegible]	0.0	0.0
1416	-0.	-0.	-.[illegible]	0.0	0.0
1417	-0.	-0.	-.[illegible]	0.0	0.0
1418	-0.	-0.	-.[illegible]	0.0	0.0
1419	-0.	-0.	-.[illegible]	0.0	0.0
1420	-0.	-0.	-.[illegible]	0.0	0.0
1421	-0.	-0.	-.[illegible]	0.0	0.0
1422	-0.	-0.	-.[illegible]	0.0	0.0
1423	-0.	-0.	-.[illegible]	0.0	0.0
1424	-0.	-0.	-.[illegible]	0.0	0.0

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 5B
DATE: 6/25/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1430	-0.	-0.	-.0	0.0	0.0
1431	-0.	-0.	-.0	0.0	0.0
1432	-0.	-0.	-.0	0.0	0.0
1433	-0.	-0.	-.0	0.0	0.0
1434	-0.	-0.	-.0	0.0	0.0
1435	-0.	-0.	-.0	0.0	0.0
1436	-0.	-0.	-.0	0.0	0.0
1437	-0.	-0.	-.0	0.0	0.0
1438	-0.	-0.	-.0	0.0	0.0
1439	-0.	-0.	-.0	0.0	0.0
1440	-0.	-0.	-.0	0.0	0.0
1441	-0.	-0.	-.0	0.0	0.0
1442	-0.	-0.	-.0	0.0	0.0
1443	-0.	-0.	-.0	0.0	0.0
1444	-0.	-0.	-.0	0.0	0.0
1445	-0.	-0.	-.0	0.0	0.0
1446	-0.	-0.	-.0	0.0	0.0
1447	-0.	-0.	-.0	0.0	0.0
1448	-0.	-0.	-.0	0.0	0.0
1449	-0.	-0.	-.0	0.0	0.0
1450	-0.	-0.	-.0	0.0	0.0
1451	-0.	-0.	-.0	0.0	0.0
1452	-0.	-0.	-.0	0.0	0.0
1453	-0.	-0.	-.0	0.0	0.0
1454	-0.	-0.	-.0	0.0	0.0
1455	-0.	-0.	-.0	0.0	0.0
1456	-0.	-0.	-.0	0.0	0.0
1457	-0.	-0.	-.0	0.0	0.0
1458	-0.	-0.	-.0	0.0	0.0
1459	-0.	-0.	-.0	0.0	0.0
1500	-0.	-0.	-.0	0.0	0.0
1501	-0.	-0.	-.0	0.0	0.0
1502	-0.	-0.	-.0	0.0	0.0
1503	-0.	-0.	-.0	0.0	0.0
1504	-0.	-0.	-.0	0.0	0.0
1505	-0.	-0.	-.0	0.0	0.0

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1506	-0.	-0.	-.0	0.0	0.0
1507	-0.	-0.	-.0	0.0	0.0
1508	-0.	-0.	-.0	0.0	0.0
1509	-0.	-0.	-.0	0.0	0.0
1510	-0.	-0.	-.0	0.0	0.0
1511	-0.	-0.	-.0	0.0	0.0
1512	-0.	-0.	-.0	0.0	0.0
1513	-0.	-0.	-.0	0.0	0.0
1514	-0.	-0.	-.0	0.0	0.0
1515	-0.	-0.	-.0	0.0	0.0
1516	-0.	-0.	-.0	0.0	0.0
1517	-0.	-0.	-.0	0.0	0.0
1518	-0.	-0.	-.0	0.0	0.0
1519	-0.	-0.	-.0	0.0	0.0
1520	-0.	-0.	-.0	0.0	0.0
1521	-0.	-0.	-.0	0.0	0.0
1522	-0.	-0.	-.0	0.0	0.0
1523	-0.	-0.	-.0	0.0	0.0
1524	-0.	-0.	-.0	0.0	0.0
1525	-0.	-0.	-.0	0.0	0.0
1526	-0.	-0.	-.0	0.0	0.0
1527	-0.	-0.	-.0	0.0	0.0
1528	-0.	-0.	-.0	0.0	0.0
1529	-0.	-0.	-.0	0.0	0.0
1530	-0.	-0.	-.0	0.0	0.0
1531	-0.	-0.	-.0	0.0	0.0
1532	-0.	-0.	-.0	0.0	0.0
1533	-0.	-0.	-.0	0.0	0.0
1534	-0.	-0.	-.0	0.0	0.0
1535	-0.	-0.	-.0	0.0	0.0
1536	-0.	-0.	-.0	0.0	0.0
1537	-0.	-0.	-.0	0.0	0.0
1538	-0.	-0.	-.0	0.0	0.0
1539	-0.	-0.	-.0	0.0	0.0
1540	-0.	-0.	-.0	0.0	0.0
1541	-0.	-0.	-.0	0.0	0.0
1542	-0.	-0.	-.0	0.0	0.0
1543	-0.	-0.	-.0	0.0	0.0
1544	-0.	-0.	-.0	0.0	0.0
1545	-0.	-0.	-.0	0.0	0.0
1546	10.	15.	12.5	-2.5	2.5
1547	12.	13.	12.5	-.6	.6
1548	11.	13.	11.9	-.6	.6
1549	11.	13.	11.9	-.6	.6
1550	11.	13.	11.3	-.8	.8
1551	11.	12.	11.5	-.6	.6

RUN NO 5B (CONTINUED)

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1552	11.	12.	11.5	-.4	.4
1553	10.	12.	11.5	-.5	.5
1554	11.	12.	11.3	-.4	.4
1555	11.	12.	11.4	-.7	.7
1556	11.	13.	11.5	-.9	.9
1557	11.	13.	11.5	-.8	.8
1558	11.	13.	11.7	-.9	.9
1559	11.	13.	11.9	-1.0	1.0
1600	10.	13.	11.9	-1.5	1.5
1601	11.	13.	12.3	-1.0	1.0
1602	11.	14.	12.5	-1.0	1.0
1603	11.	14.	12.5	-1.5	1.5
1604	11.	14.	12.6	-1.6	1.6
1605	11.	14.	12.8	-1.6	1.6
1606	12.	14.	13.0	-1.4	1.4
1607	10.	14.	12.3	-1.9	1.9
1608	10.	14.	11.9	-1.9	1.9
1609	10.	14.	12.0	-2.0	2.0
1610	-0.	14.	6.9	-6.9	6.9
1611	-0.	14.	6.9	-6.9	6.9
1612	-0.	14.	7.0	-7.0	7.0
1613	-0.	14.	6.8	-6.8	6.8
1614	-0.	14.	6.8	-6.8	6.8
1615	10.	14.	11.9	-1.9	1.8
1616	10.	14.	11.9	-1.9	1.9
1617	10.	14.	12.0	-2.0	2.0
1618	11.	14.	12.3	-1.7	1.7
1619	12.	15.	13.0	-1.5	1.5
1620	11.	14.	12.9	-1.5	1.5
1621	11.	14.	12.8	-1.4	1.4
1622	12.	14.	13.0	-1.4	1.4
1623	12.	14.	13.1	-1.3	1.3
1624	11.	14.	12.9	-1.5	1.5
1625	11.	14.	12.6	-1.8	1.8
1626	11.	15.	12.9	-1.9	1.9
1627	11.	15.	13.1	-2.1	2.1
1628	11.	15.	13.1	-2.3	2.3
1629	11.	15.	13.4	-2.0	2.0
1630	12.	15.	13.5	-1.7	1.7
1631	12.	15.	13.4	-1.8	1.8
1632	11.	15.	13.2	-2.0	2.0
1633	12.	15.	13.3	-1.7	1.7
1634	12.	15.	13.4	-1.4	1.4
1635	11.	15.	13.2	-2.0	2.0
1636	11.	15.	13.2	-2.4	2.4
1637	11.	16.	13.4	-2.2	2.2

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1638	12.	16.	13.6	-2.0	2.0
1639	12.	16.	13.8	-2.1	2.1
1640	12.	16.	13.8	-2.1	2.1
1641	12.	15.	13.5	-1.9	1.9
1642	12.	15.	13.5	-1.9	1.9
1643	12.	15.	13.2	-1.6	1.6
1644	11.	15.	13.3	-1.8	1.8
1645	11.	15.	12.7	-1.9	1.9
1646	10.	14.	12.4	-2.0	2.0
1647	11.	14.	12.6	-1.8	1.8
1648	11.	14.	12.5	-1.5	1.5
1649	11.	14.	12.3	-1.7	1.7
1650	11.	13.	11.7	-1.0	1.0
1651	11.	14.	12.2	-1.3	1.3
1652	11.	15.	13.1	-1.9	1.9
1653	11.	15.	12.8	-2.2	2.2
1654	10.	15.	12.7	-2.7	2.7
1655	-0.	17.	8.3	-8.3	8.3
1656	-0.	21.	10.6	-10.6	10.6
1657	-0.	23.	11.2	-11.3	11.3
1658	-0.	-0.	-.0	0.0	0.0
1659	-0.	-0.	-.0	0.0	0.0
1700	-0.	-0.	-.0	0.0	0.0
1701	-0.	-0.	-.0	0.0	0.0
1702	-0.	-0.	-.0	0.0	0.0
1703	-0.	-0.	-.0	0.0	0.0
1704	-0.	-0.	-.0	0.0	0.0
1705	-0.	-0.	-.0	0.0	0.0
1706	-0.	-0.	-.0	0.0	0.0
1707	-0.	-0.	-.0	0.0	0.0
1708	-0.	-0.	-.0	0.0	0.0
1709	-0.	-0.	-.0	0.0	0.0

APPENDIX B-2

TOTAL VISIBLE EMISSION DATA

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 1
DATE: 6/18/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1809	14.	21.	18.1	-2.5	2.5
1810	16.	20.	18.3	-2.1	2.1
1811	17.	21.	18.8	-2.1	2.1
1812	17.	21.	18.6	-1.9	1.9
1813	14.	20.	18.2	-2.0	2.0
1814	14.	20.	18.1	-2.3	2.3
1815	15.	20.	17.6	-2.4	2.4
1816	15.	19.	16.9	-2.3	2.3
1817	15.	18.	16.5	-1.5	1.5
1818	15.	17.	16.0	-1.0	1.0
1819	15.	17.	16.1	-.9	.9
1820	15.	18.	16.4	-1.4	1.4
1821	15.	19.	16.9	-2.4	2.4
1822	14.	20.	17.3	-3.1	3.1
1823	13.	21.	16.9	-4.0	4.0
1824	13.	21.	16.5	-4.0	4.0
1825	13.	20.	16.0	-3.5	3.5
1826	13.	18.	15.4	-2.3	2.3
1827	14.	15.	14.5	-.5	.5
1828	14.	15.	14.5	-.1	.1
1829	14.	15.	14.5	-.1	.1
1830	15.	15.	15.2	.0	0.0
1831	15.	16.	15.4	-.2	.2
1832	15.	15.	14.9	-.3	.3
1833	14.	16.	14.8	-.8	.8
1834	14.	16.	14.8	-.8	.8
1835	14.	16.	14.7	-1.1	1.1
1836	12.	16.	14.2	-1.9	1.9
1837	11.	16.	13.8	-2.3	2.3
1838	11.	17.	14.0	-3.1	3.1
1839	10.	17.	13.4	-3.4	3.4
1840	9.	16.	12.7	-3.5	3.5
1841	9.	15.	12.1	-2.9	2.9
1842	9.	14.	11.5	-2.3	2.3
1843	9.	13.	11.0	-2.1	2.1
1844	10.	12.	10.8	-1.3	1.3

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1845	10.	12.	11.4	-.9	.9
1846	10.	12.	10.9	-1.4	1.4
1847	9.	13.	10.7	-2.0	2.0
1848	8.	14.	11.0	-3.1	3.1
1849	7.	15.	10.9	-3.6	3.6
1850	7.	14.	10.7	-3.6	3.6
1851	6.	13.	9.7	-3.2	3.2
1852	6.	11.	9.0	-2.5	2.5
1853	6.	10.	8.2	-1.8	1.8
1854	6.	9.	7.7	-1.3	1.3

AIION

APPENDIX B-2
TOTAL VISIBLE EMISSION DATA

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 2
DATE: 6/19/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY		OBSERVER AVERAGE	OBSERVER DEVIATION	
	PLCHR	SNYDR		PLCHR	SNYDR
1510	17.	18.	17.5	-.8	.8
1511	16.	18.	16.7	-.8	.8
1512	15.	16.	15.7	-.7	.7
1513	15.	15.	14.9	-.3	.3
1514	14.	14.	13.9	-.1	.1
1515	14.	14.	13.6	-.1	.1
1516	13.	14.	13.5	-.6	.6
1517	14.	16.	15.0	-1.3	1.3
1518	14.	17.	15.5	-1.1	1.1
1519	14.	17.	15.3	-1.6	1.6
1520	14.	18.	15.8	-1.7	1.7
1521	14.	18.	15.8	-2.1	2.1
1522	14.	18.	15.8	-2.3	2.3
1523	13.	17.	15.1	-2.0	2.0
1524	14.	19.	16.4	-2.4	2.4
1525	16.	22.	18.9	-3.0	3.0
1526	18.	24.	21.0	-3.3	3.3
1527	19.	26.	22.6	-3.9	3.9
1528	19.	28.	23.6	-4.5	4.5
1529	19.	29.	23.9	-4.7	4.7
1530	19.	27.	22.9	-4.4	4.4
1531	18.	25.	21.5	-3.1	3.1
1532	18.	24.	20.6	-3.1	3.1
1533	17.	22.	19.4	-2.7	2.7
1534	16.	20.	17.9	-2.3	2.3
1535	15.	19.	17.1	-2.3	2.3
1536	14.	20.	16.9	-2.7	2.7
1537	13.	20.	16.4	-3.9	3.9
1538	11.	19.	15.0	-3.5	3.5
1539	12.	18.	14.9	-3.2	3.2
1540	13.	20.	16.6	-3.9	3.9
1541	14.	24.	19.1	-4.7	4.7
1542	16.	26.	20.9	-5.1	5.1
1543	18.	28.	22.9	-5.4	5.4
1544	18.	30.	23.9	-5.7	5.7
1545	19.	30.	24.4	-5.6	5.6

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY		OBSERVER AVERAGE	OBSERVER DEVIATION	
	PLCHR	SNYDR		PLCHR	SNYDR
1546	19.	29.	23.8	-5.0	5.0
1547	19.	27.	22.7	-4.0	4.0
1548	19.	25.	22.3	-3.1	3.1
1549	19.	24.	21.7	-2.3	2.3
1550	21.	24.	22.3	-1.7	1.7
1551	21.	25.	23.1	-2.3	2.3
1552	22.	28.	25.3	-3.0	3.0
1553	24.	32.	27.7	-4.0	4.0
1554	25.	34.	29.7	-4.7	4.7
1555	26.	36.	30.9	-5.3	5.3
1556	25.	37.	30.9	-6.4	6.4
1557	24.	35.	29.4	-5.8	5.8
1558	22.	33.	27.6	-5.3	5.3
1559	21.	32.	26.1	-5.5	5.5
1600	19.	31.	24.7	-5.9	5.9
1601	18.	31.	24.4	-6.5	6.5
1602	21.	33.	26.8	-5.9	5.9
1603	22.	36.	29.1	-6.8	6.8
1604	21.	36.	28.9	-7.4	7.4
1605	21.	36.	28.8	-7.3	7.3
1606	23.	36.	29.1	-6.6	6.6
1607	23.	35.	29.1	-5.7	5.7
1608	21.	33.	27.4	-5.9	5.9
1609	21.	32.	26.5	-5.8	5.8
1610	21.	31.	26.1	-5.3	5.3
1611	20.	29.	24.4	-4.8	4.8
1612	17.	28.	22.6	-5.3	5.3
1613	16.	27.	21.4	-5.3	5.3
1614	16.	25.	20.4	-4.8	4.8
1615	15.	24.	19.4	-4.6	4.6
1616	15.	23.	19.1	-4.1	4.1
1617	15.	23.	19.4	-4.0	4.0
1618	16.	23.	19.5	-3.9	3.9
1619	15.	23.	19.3	-4.1	4.1
1620	14.	23.	18.4	-4.5	4.5
1621	14.	23.	19.6	-3.7	3.8
1622	18.	23.	20.4	-2.9	2.9
1623	17.	23.	20.0	-2.7	2.7
1624	18.	22.	19.8	-2.3	2.3
1625	18.	22.	19.9	-2.0	2.0
1626	19.	22.	20.6	-1.7	1.7
1627	20.	23.	21.4	-1.8	1.8
1628	20.	25.	22.6	-2.2	2.2
1629	24.	27.	25.4	-1.7	1.7
1630	24.	28.	27.2	-.9	.9
1631	28.	29.	28.6	-.3	.3

RUN NO 2 (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1632	30.	30.	29.6	0.0	0.0
1633	30.	30.	30.1	.3	-.3
1634	31.	30.	30.3	.3	-.3
1635	30.	30.	30.1	.3	-.3
1636	31.	30.	30.5	.3	-.3
1637	31.	30.	30.6	.4	-.4
1638	32.	29.	30.4	1.2	-1.2
1639	26.	26.	26.2	-.3	.3
1640	20.	23.	21.7	-1.4	1.4
1641	16.	21.	18.3	-2.3	2.3
1642	13.	18.	15.4	-2.9	2.9
1643	14.	16.	14.9	-1.1	1.1
1644	14.	14.	14.0	-.0	.0
1645	16.	14.	15.2	.9	-.9
1646	18.	15.	16.2	1.3	-1.3
1647	17.	14.	15.7	1.4	-1.4
1648	17.	14.	15.3	1.4	-1.4
1649	15.	13.	14.3	.9	-.9
1650	15.	14.	14.4	.4	-.4
1651	13.	14.	13.6	-.3	.3
1652	13.	14.	13.6	-.7	.7
1653	13.	15.	14.2	-.8	.8
1654	13.	15.	14.0	-.8	.8
1655	15.	17.	15.7	-.9	.9
1656	14.	19.	17.9	-1.5	1.5
1657	19.	22.	20.6	-1.7	1.7
1658	21.	25.	23.0	-2.0	2.0
1659	24.	28.	25.9	-2.2	2.2
1700	27.	31.	29.0	-2.3	2.3
1701	28.	32.	29.9	-1.8	1.8
1702	29.	31.	30.4	-1.0	1.0
1703	30.	31.	30.7	-.7	.7
1704	31.	32.	31.7	-.4	.4
1705	32.	32.	31.9	.2	-.2
1706	32.	31.	31.6	.3	-.3
1707	32.	32.	32.0	.1	-.1
1708	32.	32.	32.0	.1	-.1
1709	31.	32.	31.5	-.4	.4
1710	30.	31.	30.8	-.4	.4
1711	29.	31.	30.3	-.9	.9
1712	28.	30.	28.6	-.9	.9
1713	27.	29.	27.7	-.8	.8
1714	26.	27.	26.4	-.7	.7
1715	26.	26.	26.1	.3	-.3
1716	26.	25.	25.6	.6	-.6
1717	26.	25.	25.2	.7	-.7

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1718	27.	26.	26.6	.7	-.7
1719	27.	26.	26.3	.3	-.3
1720	26.	26.	26.1	-.3	.3
1721	23.	26.	24.4	-1.1	1.1
1722	22.	25.	23.3	-1.6	1.6
1723	21.	24.	22.6	-1.8	1.8
1724	19.	24.	21.8	-2.6	2.6
1725	19.	25.	21.8	-3.0	3.0
1726	19.	26.	22.5	-3.3	3.3
1727	20.	27.	23.5	-3.1	3.1
1728	20.	26.	23.4	-3.0	3.0
1729	20.	27.	23.2	-3.4	3.4
1730	19.	26.	22.3	-3.3	3.3
1731	18.	24.	21.0	-3.3	3.3
1732	16.	22.	19.0	-2.9	2.9
1733	14.	20.	16.8	-3.0	3.0
1734	13.	18.	15.3	-2.8	2.8
1735	12.	17.	14.5	-2.4	2.4
1736	12.	16.	14.0	-1.7	1.7
1737	13.	15.	13.6	-1.1	1.1
1738	13.	14.	13.2	-.7	.7
1739	13.	14.	13.4	-.2	.2
1740	14.	14.	13.9	.1	-.1
1741	14.	13.	13.6	.4	-.4
1742	14.	14.	14.0	-.0	.0
1743	15.	15.	14.7	-.1	.1
1744	16.	16.	16.1	.1	-.1
1745	17.	17.	16.9	-.3	.3
1746	17.	19.	17.9	-.8	.8
1747	18.	20.	19.0	-1.1	1.1
1748	19.	20.	19.4	-.7	.7
1749	19.	20.	19.9	-.5	.5
1750	19.	21.	20.2	-.8	.8
1751	20.	22.	20.8	-.8	.8
1752	20.	21.	20.5	-.5	.5
1753	19.	20.	19.6	-.6	.6
1754	18.	20.	19.1	-.9	.9
1755	16.	19.	17.5	-1.0	1.0
1756	16.	18.	16.9	-1.1	1.1
1757	15.	17.	15.8	-1.1	1.1
1758	13.	16.	14.4	-1.5	1.5
1759	13.	14.	13.4	-.9	.9
1800	10.	11.	10.6	-.6	.6
1801	-0.	-0.	-.0	0.0	0.0
1802	-0.	-0.	-.0	0.0	0.0
1803	-0.	-0.	-.0	0.0	0.0

RUN NO 2 (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1804	-0.	-0.	-.0	0.0	0.0
1805	-0.	-0.	-.0	0.0	0.0
1806	-0.	-0.	-.0	0.0	0.0
1807	-0.	-0.	-.0	0.0	0.0
1808	-0.	-0.	-.0	0.0	0.0
1809	-0.	-0.	-.0	0.0	0.0
1810	-0.	-0.	-.0	0.0	0.0
1811	-0.	-0.	-.0	0.0	0.0
1812	-0.	-0.	-.0	0.0	0.0
1813	-0.	-0.	-.0	0.0	0.0
1814	-0.	-0.	-.0	0.0	0.0
1815	-0.	-0.	-.0	0.0	0.0
1816	-0.	-0.	-.0	0.0	0.0
1817	-0.	-0.	-.0	0.0	0.0
1818	-0.	-0.	-.0	0.0	0.0
1819	-0.	-0.	-.0	0.0	0.0
1820	-0.	-0.	-.0	0.0	0.0
1821	-0.	-0.	-.0	0.0	0.0
1822	-0.	-0.	-.0	0.0	0.0
1823	-0.	-0.	-.0	0.0	0.0
1824	-0.	-0.	-.0	0.0	0.0
1825	-0.	-0.	-.0	0.0	0.0
1826	-0.	-0.	-.0	0.0	0.0
1827	-0.	-0.	-.0	0.0	0.0
1828	-0.	-0.	-.0	0.0	0.0
1829	-0.	-0.	-.0	0.0	0.0
1830	-0.	-0.	-.0	0.0	0.0
1831	-0.	-0.	-.0	0.0	0.0
1832	-0.	-0.	-.0	0.0	0.0
1833	-0.	-0.	-.0	0.0	0.0
1834	-0.	-0.	-.0	0.0	0.0
1835	-0.	-0.	-.0	0.0	0.0
1836	-0.	-0.	-.0	0.0	0.0
1837	-0.	-0.	-.0	0.0	0.0
1838	15.	17.	16.2	-1.2	1.2
1839	15.	16.	15.3	-.3	.3
1840	16.	16.	16.0	-.2	.2
1841	17.	17.	17.0	-.2	.2
1842	18.	18.	17.5	.0	-.0
1843	18.	18.	18.1	.0	-.0
1844	19.	19.	19.0	.2	-.2

PLANT: [illegible]
LOCATION: [illegible]
EPA TEST: RUN NO 3A
DATE: 6/20/75

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
940	21.	21.	21.4	.1	-.1
941	23.	21.	22.2	.9	-.9
942	23.	23.	21.8	1.5	-1.5
943	24.	21.	22.2	2.9	-2.9
944	25.	24.	22.9	2.1	-2.1
945	25.	23.	22.9	2.5	-2.5
946	26.	20.	23.4	3.0	-3.0
947	26.	20.	23.2	3.0	-3.0
948	28.	21.	24.6	3.3	-3.3
949	29.	22.	25.1	3.4	-3.4
950	28.	22.	25.1	3.2	-3.2
951	28.	21.	24.7	3.2	-3.2
952	28.	21.	24.9	3.4	-3.4
953	30.	21.	25.6	4.2	-4.2
954	29.	21.	25.0	4.0	-4.0
955	28.	21.	24.4	3.3	-3.3
956	27.	21.	23.8	2.9	-2.9
957	24.	21.	22.8	1.6	-1.6
958	21.	22.	21.4	-.3	.3
959	18.	22.	19.7	-2.2	2.2
1000	16.	21.	18.3	-2.7	2.7
1001	15.	20.	17.5	-2.7	2.7
1002	15.	20.	17.4	-2.4	2.4
1003	16.	19.	17.3	-1.3	1.3
1004	17.	17.	17.3	0.0	0.0
1005	18.	16.	17.7	.8	-.8
1006	19.	15.	17.6	1.5	-1.6
1007	19.	15.	17.1	1.9	-1.9
1008	18.	15.	16.3	1.5	-1.5
1009	16.	15.	15.5	.5	-.5
1010	15.	15.	15.1	-.2	.2
1011	14.	15.	14.7	-.5	.5
1012	15.	15.	15.4	-.4	.4
1013	15.	15.	15.1	-.1	.1
1014	16.	15.	15.4	.8	-.8
1015	18.	15.	16.5	1.9	-1.9

RUN 3A (CONTINUED)

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1016	20.	19.	17.4	2.4	-2.8
1017	22.	15.	18.3	3.4	-3.7
1018	22.	16.	19.1	3.2	-3.2
1019	22.	16.	18.9	2.4	-2.9
1020	22.	16.	19..	2.7	-2.7
1021	21.	16.	18.8	2.7	-2.7
1022	21.	16.	18.5	2.3	-2.3
1023	21.	17.	18.8	1.9	-1.9
1024	22.	17.	19.2	2.5	-2.5
1025	23.	17.	20.1	3..	-3.1
1026	23.	17.	20.3	3.1	-3.0
1027	23.	18.	20.7	2.4	-2.4
1028	24.	20.	21.8	2.3	-2.0
1029	23.	21.	21.6	1.8	-1.6
1030	22.	21.	21.2	1.1	-1.1
1031	21.	21.	20.4	.2	-.2
1032	20.	21.	20.3	-.1	.1
1033	21.	20.	20.4	.2	-.2
1034	21.	19.	19.8	1.3	-1.0
1035	21.	18.	19.7	1.3	-1.3
1036	21.	18.	19.9	1.4	-1.4
1037	22.	18.	19.8	1.9	-1.9
1038	23.	18.	20.2	2.3	-2.3
1039	23.	17.	19.9	2.6	-2.6
1040	-0.	17.	8.5	-8.5	8.5
1041	-0.	17.	8.7	-8.7	8.7
1042	+0.	17.	8.5	-8.5	8.5
1043	-0.	18.	8.9	-8.9	8.9
1044	-0.	17.	8.7	-8.7	8.7
1045	-0.	18.	8.7	-8.8	8.8
1046	-0.	19.	9.4	-9.4	9.4
1047	-0.	20.	9.8	-9.8	9.8
1048	-0.	20.	10.1	-10.1	10.1
1049	-0.	20.	10.1	-10.1	10.1
1050	-0.	20.	10.2	-10.2	10.2
1051	39.	20.	29.5	9.3	-9.3
1052	39.	19.	29.0	9.8	-9.8
1053	39.	19.	29.3	10.1	-10.1
1054	38.	18.	28.2	9.3	-9.9
1055	39.	18.	28.7	10.3	-10.3
1056	39.	20.	29.4	9.3	-9.8
1057	39.	21.	30.1	9.3	-9.3
1058	39.	21.	30.0	9.1	-9.0
1059	38.	22.	29.4	8.1	-8.1
1100	37.	22.	29.2	7.3	-7.5
1101	34.	21.	27.9	6.4	-6.4

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1102	32.	20.	26..	5.3	-5.8
1103	31.	19.	25.1	5.7	-5.7
1104	31.	20.	25.5	5.5	-5.5
1105	31.	19.	25.1	5.7	-5.7
1106	32.	19.	25.7	6.4	-6.4
1107	33.	19.	25.8	6.9	-6.9
1108	34.	19.	26.4	7.2	-7.2
1109	33.	19.	26.1	6.9	-6.8
1110	33.	19.	26.1	6.9	-6.8
1111	33.	20.	26.3	6.7	-6.7
1112	33.	21.	27.1	6.1	-6.0
1113	34.	22.	28.0	5.9	-5.9
1114	34.	22.	28.1	5.9	-5.9
1115	35.	22.	28.5	6.9	-6.9
1116	35.	22.	28.5	6.9	-6.9
1117	37.	21.	29.3	7.7	-7.7
1118	36.	21.	28.7	7.8	-7.8
1119	35.	20.	28.3	7.5	-7.5
1120	36.	20.	28.2	7.7	-7.7
1121	36.	21.	28.4	7.2	-7.2
1122	35.	21.	28.3	7.1	-7.1
1123	34.	21.	27.3	6.5	-6.5
1124	33.	21.	26.9	6.3	-6.6
1125	33.	21.	27.4	5.9	-5.9
1126	34.	20.	26.3	5.8	-5.8
1127	35.	22.	28.2	6.4	-6.4
1128	36.	21.	28.5	7.1	-7.1
1129	36.	21.	28.8	7.7	-7.7
1130	37.	21.	29..	7.9	-7.9
1131	36.	21.	28.9	7.4	-7.4
1132	36.	22.	29.1	7.1	-7.1
1133	35.	24.	29.2	5.4	-5.4
1134	34.	25.	29.2	4.4	-4.4
1135	33.	25.	29.1	4.3	-4.3
1136	33.	24.	28.8	4.3	-4.3
1137	33.	24.	28.6	4.5	-4.5
1138	32.	24.	27.6	4.1	-4.1
1139	32.	22.	27.1	4.6	-4.6
1140	31.	22.	26.5	4.3	-4.9
1141	31.	22.	26.9	4.5	-4.5
1142	31.	23.	27.2	4.1	-4.0
1143	31.	23.	27.1	4.3	-4.3
1144	31.	22.	26.7	4.3	-4.8
1145	31.	23.	26.9	4.4	-4.4
1146	31.	24.	27.2	3.5	-3.6
1147	30.	24.	27.1	3.1	-3.1

RUN 3A (CONTINUED) OBSERVER PATH LENGTH

TIME	AVERAGE OPACITY		OBSERVER PATH LENGTH AVERAGE	OBSERVER DEVIATION	
	PLCHR	SNYDR		PLCHR	SNYDR
1148	32.	24.	26.9	3.1	-3.1
1149	30.	24.	27.1	2.7	-2.7
1150	30.	25.	27.2	2.1	-2.1
1151	30.	25.	27.5	2.1	-2.1
1152	30.	25.	27.4	2.2	-2.2
1153	29.	25.	26.8	1.8	-1.8
1154	27.	25.	26.1	1.1	-1.1
1155	27.	24.	25.5	1.1	-1.1
1156	27.	24.	25.7	1.3	-1.5
1157	25.	24.	24.5	.5	-.5
1158	23.	24.	23.8	-.7	.7
1159	23.	24.	23.5	-1.0	1.0
1200	22.	25.	23.6	-1.3	1.3
1201	22.	25.	23.4	-1.7	1.7
1202	21.	25.	23.1	-2.1	2.9
1203	21.	24.	23.0	-1.5	1.5
1204	22.	24.	23.0	-1.1	1.1
1205	21.	24.	22.7	-1.5	1.5
1206	21.	24.	22.4	-1.1	1.1
1207	21.	24.	22.2	-1.4	1.4
1208	20.	23.	21.9	-1.5	1.5
1209	20.	23.	21.6	-1.4	1.4
1210	20.	23.	21.5	-1.2	1.2
1211	22.	22.	22.3	.0	-.0
1212	24.	22.	22.8	.7	-.7
1213	25.	21.	22.9	1.9	-1.9
1214	26.	22.	24.0	2.1	-2.1
1215	28.	23.	25.2	2.3	-2.3
1216	30.	24.	26.7	3.1	-3.1
1217	31.	24.	27.7	3.6	-3.6
1218	32.	24.	27.9	3.3	-3.8
1219	33.	26.	29.1	3.6	-3.6
1220	34.	25.	29.4	4.6	-4.6
1221	35.	25.	29.8	5.0	-5.0
1222	35.	24.	29.5	5.3	-5.3
1223	34.	24.	29.1	4.7	-4.7
1224	34.	25.	29.3	4.5	-4.5
1225	35.	26.	30.1	4.5	-4.5
1226	35.	26.	30.4	4.4	-4.4
1227	35.	26.	30.5	4.7	-4.7
1228	36.	25.	30.5	5.5	-5.5
1229	38.	24.	31.9	6.6	-6.6
1230	39.	24.	31.1	7.6	-7.6
1231	38.	22.	29.9	8.0	-8.0
1232	37.	21.	29.0	7.9	-7.9
1233	36.	20.	28.3	8.1	-8.1

OBSERVER PATH LENGTH

TIME	AVERAGE OPACITY		OBSERVER PATH LENGTH AVERAGE	OBSERVER DEVIATION	
	PLCHR	SNYDR		PLCHR	SNYDR
1234	36.	21.	28.5	7.5	-7.5
1235	36.	21.	28.4	7.6	-7.6
1236	36.	21.	28.2	7.6	-7.6
1237	37.	21.	28.8	7.9	-7.9
1238	37.	21.	29.1	8.0	-8.0
1239	36.	21.	28.9	7.6	-7.6
1240	35.	21.	27.7	7.3	-7.3
1241	32.	20.	25.9	5.9	-5.9
1242	29.	21.	24.9	4.1	-4.1
1243	25.	20.	22.7	2.3	-2.3
1244	21.	20.	20.5	.3	-.8
1245	18.	17.	17.8	.3	-.3
1246	15.	16.	15.7	-.7	.7
1247	13.	17.	15.1	-1.9	1.9
1248	11.	15.	13.8	-2.3	2.3
1249	10.	14.	11.9	-2.1	2.1
1250	9.	12.	10.7	-1.4	1.4
1251	8.	13.	10.5	-2.4	2.4
1252	7.	11.	9.4	-2.1	2.1
1253	6.	9.	7.6	-1.1	1.1
1254	6.	7.	6.4	-.5	.5

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 3B
DATE: 6/20/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

TIME	AVERAGE OPACITY PLOHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH OBSERVER AVERAGE	OBSERVER DEVIATION PLOHR	OBSERVER DEVIATION SNYDR
1534	15.	19.	16.8	-1.8	1.8
1535	15.	19.	17.2	-2.2	2.2
1536	15.	20.	17.6	-2.6	2.6
1537	15.	22.	18.7	-3.5	3.3
1538	15.	23.	18.8	-3.8	3.8
1539	15.	24.	19.7	-4.3	4.3
1540	15.	24.	19.5	-4.5	4.5
1541	15.	24.	19.7	-4.7	4.7
1542	15.	24.	19.4	-4.4	4.4
1543	15.	23.	18.9	-3.9	3.9
1544	15.	23.	18.9	-3.9	3.9
1545	15.	24.	19.3	-4.3	4.3
1546	15.	23.	18.9	-3.9	3.9
1547	14.	22.	18.1	-4.0	4.0
1548	14.	21.	17.6	-3.9	3.9
1549	14.	21.	17.2	-3.5	3.5
1550	14.	21.	17.3	-3.5	3.5
1551	14.	20.	16.7	-2.9	2.9
1552	14.	20.	17.-	-3.2	3.2
1553	15.	20.	17.3	-2.7	2.7
1554	15.	21.	17.8	-2.8	2.8
1555	15.	21.	18.1	-3.1	3.1
1556	15.	20.	17.7	-2.7	2.7
1557	15.	20.	17.6	-2.6	2.6
1558	14.	19.	16.4	-2.6	2.6
1559	14.	20.	16.9	-2.7	2.7
1600	13.	19.	15.9	-2.6	2.6
1601	13.	18.	15.6	-2.6	2.6
1602	12.	18.	15.2	-3.1	3.1
1603	11.	18.	14.6	-3.8	3.8
1604	11.	19.	14.8	-4.1	4.0
1605	10.	19.	14.6	-4.6	4.6
1606	10.	20.	14.9	-4.7	4.7
1607	11.	20.	15.1	-4.5	4.5
1608	11.	19.	15.1	-4.1	4.1
1609	12.	19.	15.2	-3.5	3.5

TIME	AVERAGE OPACITY PLOHR	AVERAGE OPACITY SNYDR	OBSERVED PATH LENGTH OBSERVER AVERAGE	OBSERVER DEVIATION PLOHR	OBSERVER DEVIATION SNYDR
1540	12.	19.	15.2	-3.5	3.5
1541	12.	19.	15.2	-3.5	3.5
1542	12.	19.	15.5	-3.6	3.6
1543	12.	20.	15.7	-4.1	4.1
1544	11.	22.	16.5	-5.2	5.2
1545	11.	23.	16.8	-5.7	5.7
1546	11.	23.	16.9	-5.8	5.8
1547	12.	23.	17.3	-5.6	5.6
1548	12.	23.	17.3	-5.2	5.2
1549	11.	23.	17.0	-5.5	5.5
1550	11.	20.	15.9	-4.5	4.5
1551	11.	21.	16.1	-4.6	4.6
1552	11.	20.	15.8	-4.4	4.4
1553	11.	19.	15.3	-4.1	4.1
1554	10.	20.	15.2	-4.8	4.8
1555	10.	20.	15.2	-4.8	4.8
1556	10.	21.	15.5	-5.1	5.1
1557	11.	20.	15.3	-4.5	4.5
1558	11.	19.	15.0	-4.2	4.2
1559	11.	19.	15.0	-4.0	4.0
1600	12.	18.	14.9	-3.1	3.0
1601	13.	17.	14.8	-2.1	2.1
1602	14.	17.	15.1	-1.6	1.6
1603	14.	17.	15.2	-1.7	1.7
1604	14.	17.	15.3	-1.4	1.4
1605	14.	16.	15.2	-1.1	1.0
1606	14.	16.	15.1	-1.-	1.4
1607	13.	17.	14.8	-1.9	1.9
1608	13.	15.	14.1	-1.1	1.1
1609	13.	15.	13.5	-1.0	1.6
1610	12.	15.	13.8	-1.7	1.7
1611	12.	15.	13.8	-1.7	1.7
1612	12.	15.	13.2	-1.6	1.6
1613	12.	14.	13.-	-1.4	1.4
1614	11.	15.	13.2	-2.4	2.4
1615	11.	16.	13.2	-2.4	2.4
1616	12.	15.	13.6	-1.7	1.7
1617	12.	16.	14.-	-2.2	2.2
1618	13.	17.	14.9	-2.2	2.2
1619	13.	17.	15.2	-2.1	2.0
1620	13.	17.	15.3	-2.2	2.2
1621	13.	18.	15.7	-2.6	2.6
1622	12.	18.	15.1	-3.1	3.0

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 4
DATE: 6/23/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1530	36.	21.	28.8	7.5	-7.5
1531	36.	19.	27.2	8.4	-8.4
1532	36.	18.	26.9	9.0	-9.0
1533	36.	16.	26.4	9.9	-9.9
1534	36.	16.	26.1	10.1	-10.1
1535	36.	16.	26.0	9.8	-9.8
1536	36.	16.	26.4	9.9	-9.9
1537	37.	17.	27.0	9.7	-9.7
1538	36.	17.	26.6	9.3	-9.3
1539	36.	18.	26.9	9.0	-9.0
1540	36.	18.	26.7	9.2	-9.2
1541	35.	17.	25.7	8.9	-8.9
1542	33.	17.	25.0	8.3	-8.3
1543	32.	16.	24.0	8.3	-8.3
1544	31.	14.	22.6	8.4	-8.4
1545	28.	13.	20.1	7.6	-7.6
1546	24.	12.	17.8	6.1	-6.1
1547	22.	12.	17.1	5.2	-5.2
1548	20.	12.	16.1	4.1	-4.1
1549	18.	12.	15.2	3.1	-3.1
1550	17.	13.	14.8	1.9	-1.9
1551	14.	14.	15.1	.7	-.7
1552	14.	15.	15.1	.5	-.5
1553	14.	15.	14.6	-.2	.2
1554	14.	16.	15.1	-1.1	1.1
1555	14.	17.	15.2	-1.7	1.7
1556	14.	17.	15.1	-1.6	1.6
1557	14.	15.	14.5	-.9	.9
1558	13.	15.	14.0	-1.0	1.0
1559	13.	15.	13.9	-.9	.9
1600	12.	14.	12.8	-.7	.7
1601	11.	13.	12.0	-.7	.7
1602	10.	13.	11.5	-1.0	1.0
1603	10.	13.	11.6	-1.6	1.6
1604	10.	14.	11.9	-1.9	1.9
1605	10.	14.	12.3	-2.1	2.1

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1606	10.	14.	12.2	-2.0	2.0
1607	10.	15.	12.4	-2.2	2.2
1608	10.	15.	12.4	-2.2	2.2
1609	10.	14.	12.2	-2.0	2.0
1610	10.	14.	12.1	-1.9	1.9
1611	10.	13.	11.6	-1.6	1.6
1612	10.	13.	11.6	-1.6	1.6
1613	10.	13.	11.9	-1.5	1.5
1614	11.	14.	12.7	-1.5	1.5
1615	12.	15.	13.6	-1.6	1.6
1616	13.	16.	14.2	-1.5	1.5
1617	13.	16.	14.8	-1.7	1.7
1618	14.	17.	15.2	-1.7	1.7
1619	13.	18.	15.3	-2.2	2.2
1620	12.	18.	15.0	-2.7	2.7
1621	12.	18.	14.9	-3.0	3.0
1622	11.	18.	14.8	-3.5	3.5
1623	11.	19.	14.7	-3.9	3.9
1624	10.	18.	14.4	-4.0	4.0
1625	10.	18.	14.2	-3.8	3.8
1626	10.	17.	13.9	-3.4	3.4
1627	10.	16.	13.2	-3.2	3.2
1628	10.	16.	13.0	-3.0	3.0
1629	10.	15.	12.4	-2.4	2.4
1630	10.	14.	12.2	-2.2	2.2
1631	11.	14.	12.5	-1.7	1.7
1632	12.	14.	12.9	-1.3	1.3
1633	12.	14.	12.7	-1.0	1.0
1634	12.	14.	12.6	-.9	.9
1635	12.	14.	12.9	-1.3	1.3
1636	12.	15.	13.1	-1.5	1.5
1637	11.	14.	12.6	-1.8	1.8
1638	11.	14.	12.4	-1.6	1.6
1639	11.	14.	12.6	-1.8	1.8
1640	11.	14.	12.7	-1.5	1.5
1641	12.	13.	12.5	-.8	.8
1642	12.	13.	12.4	-.7	.7
1643	12.	12.	11.8	-.1	.1
1644	11.	11.	10.8	0.0	0.0
1645	11.	9.	10.1	.7	-.7
1646	10.	8.	9.3	1.1	-1.1
1647	9.	8.	8.3	.8	-.8
1648	9.	6.	7.4	1.4	-1.4
1649	9.	6.	7.4	1.4	-1.4
1650	9.	6.	7.5	1.3	-1.3
1651	9.	6.	7.6	1.6	-1.6

RUN NO 4 (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	SNYDR
1652	9.	6.	7.5	1.7	-1.7
1653	10.	6.	7.8	2.2	-2.2
1654	10.	6.	8.3	2.1	-2.1
1655	10.	6.	8.3	2.1	-2.1
1656	10.	6.	8.3	2.1	-2.1
1657	10.	7.	8.5	1.5	-1.5
1658	10.	8.	9.1	.9	-.9
1659	11.	9.	10.0	.8	-.8
1700	11.	9.	9.9	.9	-.9
1701	11.	9.	10.0	.8	-.8
1702	11.	9.	9.8	1.0	-1.0
1703	10.	8.	9.0	1.0	-1.0
1704	9.	7.	8.0	1.1	-1.1
1705	8.	6.	7.3	1.0	-1.0
1706	8.	6.	7.4	.9	-.9
1707	8.	6.	7.3	1.0	-1.0
1708	8.	6.	7.4	.9	-.9
1709	9.	6.	7.8	1.4	-1.4
1710	10.	6.	8.2	1.8	-1.8
1711	10.	6.	8.2	1.8	-1.8
1712	10.	6.	7.8	1.8	-1.8
1713	9.	6.	7.6	1.1	-1.1
1714	8.	7.	7.4	.5	-.5
1715	7.	7.	7.0	.1	-.1
1716	7.	8.	7.3	-.2	.2
1717	7.	7.	7.2	-.1	.1
1718	8.	8.	7.7	-.2	.2
1719	8.	8.	8.2	.1	-.1
1720	9.	8.	8.3	.8	-.8
1721	10.	8.	8.8	1.3	-1.3
1722	10.	7.	8.6	1.4	-1.4
1723	10.	7.	8.6	1.4	-1.4
1724	10.	7.	8.4	1.6	-1.6
1725	10.	7.	8.3	1.7	-1.7
1726	9.	7.	8.1	1.0	-1.0
1727	8.	8.	7.9	.4	-.4
1728	8.	8.	7.7	-.2	.2
1729	7.	9.	7.6	-.9	.9
1730	6.	8.	7.0	-1.1	1.1
1731	5.	8.	6.7	-1.7	1.7
1732	5.	9.	6.9	-1.9	1.9
1733	5.	9.	7.1	-2.1	2.1
1734	5.	9.	7.1	-2.1	2.1
1735	5.	9.	7.1	-2.1	2.1
1736	6.	10.	8.1	-2.3	2.3
1737	6.	11.	8.2	-2.4	2.4

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	SNYDR	ON
1738	6.	10.	8.0	-2.2	2.2	
1739	7.	10.	8.5	-1.9	1.9	
1740	8.	11.	9.1	-1.6	1.6	
1741	8.	11.	9.7	-1.4	1.4	
1742	8.	11.	9.9	-1.6	1.6	
1743	9.	12.	10.4	-1.3	1.3	
1744	10.	13.	11.5	-1.5	1.5	
1745	10.	14.	11.8	-1.8	1.8	
1746	10.	14.	12.1	-2.1	2.1	
1747	10.	15.	12.3	-2.3	2.3	
1748	10.	14.	12.2	-2.2	2.2	
1749	10.	14.	12.2	-2.2	2.2	
1750	10.	14.	11.8	-1.8	1.8	
1751	10.	13.	11.4	-1.4	1.4	
1752	10.	12.	10.9	-.9	.9	
1753	11.	11.	10.9	-.1	.1	
1754	12.	10.	11.0	.6	-.6	
1755	13.	10.	11.3	1.3	-1.3	
1756	13.	10.	11.7	1.7	-1.7	
1757	14.	10.	12.1	2.1	-2.1	
1758	15.	10.	12.5	2.5	-2.5	
1759	14.	10.	12.1	2.1	-2.1	
1800	13.	10.	11.7	1.7	-1.7	
1801	13.	10.	11.3	1.3	-1.3	
1802	12.	10.	10.8	.8	-.8	
1803	11.	10.	10.4	.4	-.4	
1804	10.	10.	10.0	0.0	0.0	
1805	10.	10.	10.0	0.0	0.0	
1806	10.	10.	10.0	0.0	0.0	
1807	10.	10.	10.0	0.0	0.0	
1808	10.	10.	10.0	0.0	0.0	
1809	10.	10.	10.0	0.0	0.0	
1810	10.	10.	10.0	0.0	0.0	
1811	10.	10.	10.0	0.0	0.0	
1812	10.	10.	10.0	0.0	0.0	
1813	10.	10.	10.0	0.0	0.0	
1814	10.	10.	10.0	0.0	0.0	
1815	10.	10.	10.0	0.0	0.0	
1816	10.	10.	10.0	0.0	0.0	
1817	10.	10.	10.0	0.0	0.0	
1818	10.	10.	10.0	0.0	0.0	
1819	10.	10.	10.0	0.0	0.0	
1820	10.	10.	10.2	-.2	.2	
1821	10.	11.	10.3	-.3	.3	
1822	10.	11.	10.3	-.3	.3	
1823	10.	11.	10.3	-.3	.3	

RUN NO 4 (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1824	10.	11.	10.3	-.3	.3
1825	10.	11.	10.5	-.5	.5
1826	10.	11.	10.6	-.6	.6
1827	10.	11.	10.7	-.7	.7
1828	10.	12.	10.9	-.9	.9
1829	10.	12.	10.9	-.9	.9
1830	10.	13.	11.4	-1.4	1.4
1831	10.	13.	11.4	-1.4	1.4
1832	10.	12.	11.0	-1.0	1.0
1833	10.	12.	10.8	-.8	.8
1834	10.	11.	10.6	-.6	.6
1835	10.	12.	10.9	-.9	.9
1836	10.	11.	10.5	-.5	.5
1837	10.	11.	10.3	-.3	.3
1838	10.	11.	10.5	-.5	.5
1839	11.	12.	11.3	-.6	.6
1840	11.	13.	12.1	-.6	.6
1841	12.	13.	12.6	-.3	.3
1842	13.	14.	13.4	-.3	.3
1843	14.	15.	14.5	-.5	.5
1844	15.	16.	15.4	-.6	.6
1845	15.	17.	15.9	-.9	.9
1846	15.	18.	16.4	-1.4	1.4
1847	15.	18.	16.4	-1.4	1.4
1848	15.	18.	16.4	-1.4	1.4
1849	15.	18.	16.5	-1.5	1.5
1850	15.	19.	16.8	-1.8	1.8
1851	15.	19.	17.1	-2.1	2.1
1852	15.	19.	17.1	-2.1	2.1
1853	15.	20.	17.5	-2.5	2.5
1854	15.	21.	17.9	-2.9	2.9
1855	15.	21.	17.8	-2.8	2.8
1856	15.	20.	17.3	-2.3	2.3
1857	15.	18.	16.6	-1.6	1.6
1858	15.	17.	16.1	-1.1	1.1
1859	15.	16.	15.6	-.6	.6
1900	15.	15.	15.1	-.1	.1
1901	15.	15.	14.9	.1	-.1
1902	15.	15.	14.8	.2	-.2
1903	15.	15.	14.8	.2	-.2
1904	15.	15.	14.8	.2	-.2
1905	15.	15.	14.9	.1	-.1
1906	15.	15.	15.0	0.0	0.0
1907	15.	15.	15.0	0.0	0.0
1908	14.	15.	14.6	-.4	.4
1909	13.	15.	14.2	-.8	.8

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1910	13.	15.	13.8	-1.3	1.3
1911	12.	15.	13.1	-1.5	1.5
1912	11.	14.	12.5	-1.7	1.7
1913	10.	14.	12.1	-2.1	2.1
1914	10.	14.	11.9	-1.9	1.9
1915	10.	13.	11.6	-1.6	1.6
1916	10.	13.	11.6	-1.6	1.6
1917	10.	14.	11.8	-1.8	1.8
1918	10.	14.	12.1	-2.1	2.1
1919	10.	15.	12.3	-2.3	2.3
1920	10.	16.	12.9	-2.9	2.9
1921	11.	17.	14.0	-3.1	3.1
1922	12.	18.	14.9	-3.2	3.2
1923	13.	19.	15.7	-3.2	3.2
1924	13.	20.	16.5	-3.1	3.1

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 6A
DATE: 6/25/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1004	16.	23.	19.7	-3.4	3.4
1005	16.	23.	19.2	-3.3	3.3
1006	16.	22.	18.6	-3.0	3.0
1007	16.	21.	18.4	-2.9	2.9
1008	15.	21.	18.2	-2.8	2.8
1009	15.	20.	17.7	-2.7	2.7
1010	15.	21.	18.1	-3.1	3.1
1011	16.	21.	18.5	-2.7	2.7
1012	17.	21.	19.1	-2.4	2.4
1013	18.	22.	19.7	-2.2	2.2
1014	19.	23.	20.8	-1.7	1.7
1015	21.	24.	22.2	-1.4	1.4
1016	23.	23.	22.7	-.2	.2
1017	23.	24.	23.4	-.1	.1
1018	24.	25.	24.6	-.6	.6
1019	25.	26.	25.4	-.4	.4
1020	25.	26.	25.6	-.6	.6
1021	25.	27.	25.8	-.8	.8
1022	25.	28.	26.2	-1.2	1.2
1023	-0.	30.	15.0	-15.1	15.0
1024	-0.	-0.	-.0	0.0	0.0
1025	-0.	-0.	-.0	0.0	0.0
1026	-0.	-0.	-.0	0.0	0.0
1027	-0.	-0.	-.0	0.0	0.0
1028	-0.	-0.	-.0	0.0	0.0
1029	-0.	-0.	-.0	0.0	0.0
1030	-0.	-0.	-.0	0.0	0.0
1031	-0.	-0.	-.0	0.0	0.0
1032	-0.	-0.	-.0	0.0	0.0
1033	-0.	-0.	-.0	0.0	0.0
1034	-0.	-0.	-.0	0.0	0.0
1035	-0.	-0.	-.0	0.0	0.0
1036	-0.	-0.	-.0	0.0	0.0
1037	-0.	-0.	-.0	0.0	0.0
1038	-0.	-0.	-.0	0.0	0.0
1039	-0.	-0.	-.0	0.0	0.0

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1040	-0.	-0.	-.0	0.0	0.0
1041	-0.	-0.	-.0	0.0	0.0
1042	-0.	-0.	-.0	0.0	0.0
1043	-0.	-0.	-.0	0.0	0.0
1044	-0.	-0.	-.0	0.0	0.0
1045	-0.	-0.	-.0	0.0	0.0
1046	-0.	-0.	-.0	0.0	0.0
1047	-0.	-0.	-.0	0.0	0.0
1048	-0.	-0.	-.0	0.0	0.0
1049	-0.	-0.	-.0	0.0	0.0
1050	-0.	-0.	-.0	0.0	0.0
1051	-0.	-0.	-.0	0.0	0.0
1052	-0.	-0.	-.0	0.0	0.0
1053	-0.	-0.	-.0	0.0	0.0
1054	-0.	-0.	-.0	0.0	0.0
1055	15.	15.	15.0	0.0	0.0
1056	15.	16.	15.6	-.6	.6
1057	13.	16.	14.6	-1.3	1.3
1058	13.	16.	14.2	-1.7	1.7
1059	13.	16.	14.6	-1.6	1.6
1100	13.	16.	14.3	-1.9	1.8
1101	13.	16.	14.3	-1.8	1.8
1102	13.	16.	14.1	-1.6	1.6
1103	13.	15.	14.0	-1.5	1.5
1104	13.	15.	13.9	-1.4	1.4
1105	12.	15.	13.2	-1.6	1.6
1106	12.	14.	13.0	-1.4	1.4
1107	11.	14.	12.6	-1.8	1.8
1108	10.	14.	12.2	-2.2	2.2
1109	10.	14.	12.2	-2.2	2.2
1110	10.	14.	12.4	-2.0	2.0
1111	10.	14.	12.4	-2.0	2.0
1112	10.	15.	12.6	-2.2	2.2
1113	11.	15.	13.0	-1.8	1.8
1114	11.	15.	13.0	-1.8	1.8
1115	11.	15.	13.1	-1.9	1.9
1116	12.	15.	13.3	-1.7	1.7
1117	13.	15.	13.8	-1.3	1.3
1118	13.	16.	14.5	-1.1	1.1
1119	13.	16.	14.9	-1.6	1.6
1120	14.	18.	15.9	-1.3	1.8
1121	15.	19.	16.8	-1.9	1.8
1122	15.	19.	17.1	-2.1	2.1
1123	15.	20.	17.7	-2.7	2.7
1124	15.	21.	18.1	-3.0	3.0
1125	16.	21.	18.5	-2.7	2.7

RUN NO 5A (CONTINUED) OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1126	16.	22.	18.9	-2.9	2.9
1127	16.	23.	19.6	-3.6	3.6
1128	16.	25.	20.5	-4.5	4.5
1129	16.	25.	20.8	-4.8	4.8
1130	17.	26.	21.3	-4.3	4.3
1131	16.	25.	20.9	-4.9	4.9
1132	17.	25.	21.3	-4.4	4.4
1133	18.	24.	20.7	-3.2	3.2
1134	18.	22.	20.2	-1.9	1.9
1135	19.	21.	19.9	-.7	.7
1136	20.	21.	20.3	-.3	.3
1137	22.	22.	21.7	.3	.3
1138	22.	22.	21.8	-.1	.1
1139	22.	22.	21.9	-.2	.2
1140	22.	23.	22.3	-.5	.6
1141	22.	24.	22.7	-1.3	1.3
1142	21.	23.	22.1	-1.3	1.3
1143	19.	23.	20.8	-1.7	1.7
1144	19.	22.	20.4	-1.3	1.3
1145	19.	22.	20.4	-1.3	1.3
1146	19.	21.	20.2	-1.1	1.0
1147	18.	21.	19.9	-1.6	1.6
1148	18.	21.	19.5	-1.1	1.1
1149	18.	20.	19.2	-.8	.8
1150	18.	19.	18.3	-.8	.8
1151	17.	19.	17.7	-1.1	1.0
1152	16.	19.	17.5	-1.7	1.7
1153	16.	17.	16.7	-.4	.4
1154	17.	19.	17.8	-1.1	1.1
1155	18.	21.	19.6	-1.3	1.3
1156	20.	22.	21.1	-1.1	1.1
1157	20.	22.	21.3	-.8	.8
1158	21.	21.	21.2	-.2	.2
1159	20.	23.	21.6	-1.1	1.1
1200	19.	21.	20.2	-1.1	1.0
1201	18.	20.	19.3	-.9	.9
1202	17.	20.	18.4	-1.6	1.6
1203	18.	21.	19.4	-1.7	1.7
1204	18.	22.	19.9	-2.2	2.2
1205	19.	23.	20.5	-2.1	2.0
1206	19.	23.	20.9	-1.6	1.6
1207	19.	22.	20.8	-1.5	1.5
1208	20.	22.	21.1	-1.1	1.1
1209	19.	22.	21.4	-1.7	1.7
1210	18.	22.	20.2	-1.9	1.9
1211	18.	22.	19.8	-2.3	2.3

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1212	17.	22.	19.5	-2.9	2.8
1213	17.	23.	19.0	-2.4	2.9
1214	17.	23.	19.7	-3.1	3.0
1215	17.	23.	19.9	-3.2	3.2
1216	18.	23.	20.2	-2.7	2.7
1217	18.	23.	20.1	-2.6	2.6
1218	18.	24.	20.5	-3.1	3.0
1219	17.	24.	20.2	-3.5	3.5
1220	17.	24.	20.3	-3.6	3.6
1221	18.	24.	20.8	-2.9	2.9
1222	18.	24.	20.7	-2.9	2.8
1223	19.	24.	21.1	-2.4	2.4
1224	20.	23.	21.7	-1.3	1.3
1225	21.	22.	21.8	-.5	.5
1226	20.	21.	20.7	-.7	.7
1227	18.	21.	19.6	-1.3	1.3
1228	17.	21.	18.9	-1.8	1.8
1229	16.	20.	18.0	-2.4	2.4
1230	15.	20.	16.7	-3.3	3.3
1231	13.	20.	16.3	-3.8	3.8
1232	13.	21.	16.6	-3.4	3.4
1233	14.	20.	16.8	-3.2	3.2
1234	14.	20.	17.2	-3.0	3.0
1235	16.	21.	18.2	-2.4	2.4
1236	18.	21.	19.5	-2.0	2.0
1237	18.	22.	20.3	-2.0	2.0
1238	19.	23.	21.1	-2.0	2.0
1239	20.	25.	22.5	-2.1	2.1
1240	21.	25.	23.1	-2.0	2.0
1241	22.	25.	23.4	-1.8	1.8
1242	22.	26.	24.0	-1.7	1.7
1243	24.	26.	24.9	-1.4	1.4
1244	25.	27.	25.7	-1.1	1.1
1245	25.	26.	25.3	-.7	.7
1246	25.	26.	25.5	-.7	.7
1247	24.	27.	25.5	-1.1	1.1
1248	24.	26.	24.7	-1.1	1.1
1249	22.	25.	23.6	-1.4	1.4
1250	20.	24.	22.4	-2.0	2.0
1251	20.	25.	22.1	-2.5	2.5
1252	20.	25.	22.4	-2.2	2.2
1253	20.	24.	22.1	-2.3	2.3
1254	20.	25.	22.6	-2.2	2.2
1255	21.	24.	22.7	-1.5	1.5
1256	23.	24.	23.1	-.4	.4
1257	24.	23.	23.5	.4	-.4

RUN NO 5A (CONTINUED)

TIME	AVERAGE OPACITY		AVERAGE	OBSERVER DEVIATION	
	PLCHR	SNYDR		PLCHR	SNYDR
1258	24.	23.	23.4	.5	-.5
1259	24.	23.	23.3	.6	-.6
1300	25.	23.	23.6	.3	-.9
1301	24.	24.	24.1	.2	-.3
1302	24.	24.	23.6	-.3	.3
1303	23.	24.	23.6	-.7	.7
1304	23.	24.	23.6	-.7	.7
1305	24.	25.	24.3	-.5	.5
1306	23.	25.	24.0	-1.0	1.0
1307	23.	25.	23.9	-1.1	1.1
1308	24.	26.	24.8	-.7	.7
1309	25.	26.	25.3	-.3	.3
1310	25.	26.	25.6	-.9	.6
1311	-0.	26.	13.1	-13.1	13.1
1312	-0.	23.	11.6	-11.6	11.6
1313	-0.	23.	10.0	-10.0	10.0
1314	-0.	23.	10.1	-10.1	10.0
1315	-0.	23.	10.1	-10.1	10.1
1316	-0.	23.	10.0	-10.0	10.0
1317	-0.	23.	10.0	-10.0	10.0
1318	-0.	23.	10.0	-10.0	10.0
1319	-0.	23.	10.0	-10.0	10.0
1320	-0.	23.	11.2	-11.3	11.3
1321	-0.	25.	12.5	-12.5	12.5
1322	15.	25.	20.0	-5.1	5.0
1323	15.	25.	20.0	-5.0	5.0
1324	17.	25.	20.8	-4.2	4.2
1325	18.	25.	21.7	-3.3	3.3
1326	23.	25.	22.2	-2.4	2.4
1327	21.	24.	22.2	-2.0	2.0
1328	22.	23.	22.5	-.8	.8
1329	23.	23.	22.9	-.2	.2
1330	23.	23.	22.8	-.1	.1
1331	22.	22.	22.0	-.3	.3
1332	21.	22.	20.9	-.9	.9
1333	19.	22.	20.3	-1.6	1.6
1334	17.	22.	19.7	-2.4	2.4
1335	16.	21.	18.9	-2.6	2.6
1336	15.	21.	18.2	-2.8	2.8
1337	15.	21.	17.9	-2.9	2.9
1338	15.	21.	18.1	-3.1	3.1
1339	15.	21.	18.2	-3.2	3.2
1340	15.	22.	18.5	-3.5	3.5
1341	15.	23.	18.9	-3.9	3.9
1342	15.	23.	19.1	-4.1	4.1
1343	16.	23.	19.5	-3.6	3.6

TIME	AVERAGE OPACITY		AVERAGE	OBSERVER DEVIATION	
	PLCHR	SNYDR		PLCHR	SNYDR
1344	17.	23.	19.8	-3.1	3.1
1345	18.	22.	19.9	-2.4	2.4
1346	18.	22.	20.0	-2.1	2.0
1347	19.	22.	20.5	-1.4	1.4
1348	20.	22.	20.8	-.9	.8
1349	20.	23.	21.4	-1.4	1.4
1350	20.	23.	21.7	-1.7	1.7
1351	20.	24.	22.1	-2.1	2.1
1352	20.	24.	22.1	-2.1	2.1
1353	20.	24.	22.2	-2.2	2.2
1354	20.	24.	22.2	-2.2	2.2
1355	-0.	24.	11.9	-11.9	11.9
1356	-0.	23.	11.7	-11.7	11.7
1357	-0.	23.	11.5	-11.5	11.5
1358	-0.	22.	10.9	-10.9	10.9
1359	-0.	21.	10.6	-10.6	10.6
1400	-0.	-0.	-.0	0.0	0.0
1401	-0.	-0.	-.0	0.0	0.0
1402	-0.	-0.	-.0	0.0	0.0
1403	-0.	-0.	-.0	0.0	0.0
1404	-0.	-0.	-.0	0.0	0.0
1405	-0.	-0.	-.0	0.0	0.0
1406	-0.	-0.	-.0	0.0	0.0
1407	-0.	-0.	-.0	0.0	0.0
1408	-0.	-0.	-.0	0.0	0.0
1409	-0.	-0.	-.0	0.0	0.0
1410	-0.	-0.	-.0	0.0	0.0
1411	-0.	-0.	-.0	0.0	0.0
1412	-0.	-0.	-.0	0.0	0.0
1413	-0.	-0.	-.0	0.0	0.0
1414	-0.	-0.	-.0	0.0	0.0
1415	-0.	-0.	-.0	0.0	0.0
1416	-0.	-0.	-.0	0.0	0.0
1417	-0.	-0.	-.0	0.0	0.0
1418	-0.	-0.	-.0	0.0	0.0
1419	-0.	-0.	-.0	0.0	0.0
1420	-0.	-0.	-.0	0.0	0.0
1421	-0.	-0.	-.0	0.0	0.0
1422	-0.	-0.	-.0	0.0	0.0
1423	-0.	-0.	-.0	0.0	0.0
1424	-0.	-0.	-.0	0.0	0.0

METHOD 9 REPORT

PLANT: WESTMORELAND COAL CO
LOCATION: QUINWOOD W VIRGINIA
EPA TEST: RUN NO 5B
DATE: 6/25/75

BATTELLE
COLUMBUS
LABORATORIES

OPACITY AVERAGING PERIOD: 6 MIN.
TIME BASE INTERVAL: 1 MIN.
OBSERVED PATHLENGTH: 7. FT.
REFERENCE PATHLENGTH: 7. FT.

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1430	29.	31.	30.2	-.3	.8
1431	30.	33.	31.8	-1.6	1.6
1432	32.	35.	33.2	-1.3	1.3
1433	33.	36.	34.5	-1.5	1.6
1434	34.	38.	35.8	-2.1	2.1
1435	35.	39.	36.1	-1.4	1.4
1436	36.	35.	35.7	.7	-.7
1437	38.	32.	34.9	3.2	-3.2
1438	39.	32.	35.5	3.3	-3.3
1439	40.	34.	36.7	3.3	-3.3
1440	41.	34.	36.9	3.1	-3.1
1441	40.	34.	37.2	2.8	-2.8
1442	41.	35.	37.5	2.5	-2.5
1443	-0.	37.	18.4	-18.4	18.4
1444	-0.	40.	20.3	-20.3	20.3
1445	-0.	-0.	-.0	0.0	0.0
1446	-0.	-0.	-.0	0.0	0.0
1447	-0.	-0.	-.0	0.0	0.0
1448	-0.	-0.	-.0	0.0	0.0
1449	-0.	-0.	-.0	0.0	0.0
1450	-0.	-0.	-.0	0.0	0.0
1451	-0.	-0.	-.0	0.0	0.0
1452	-0.	-0.	-.0	0.0	0.0
1453	-0.	-0.	-.0	0.0	0.0
1454	-0.	-0.	-.0	0.0	0.0
1455	-0.	-0.	-.0	0.0	0.0
1456	-0.	-0.	-.0	0.0	0.0
1457	-0.	-0.	-.0	0.0	0.0
1458	-0.	-0.	-.0	0.0	0.0
1459	-0.	-0.	-.0	0.0	0.0
1500	-0.	-0.	-.0	0.0	0.0
1501	-0.	-0.	-.0	0.0	0.0
1502	-0.	-0.	-.0	0.0	0.0
1503	-0.	-0.	-.0	0.0	0.0
1504	-0.	-0.	-.0	0.0	0.0
1505	-0.	-0.	-.0	0.0	0.0

OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1506	-0.	-0.	-.0	0.0	0.0
1507	-0.	-0.	-.0	0.0	0.0
1508	-0.	-0.	-.0	0.0	0.0
1509	-0.	-0.	-.0	0.0	0.0
1510	-0.	-0.	-.0	0.0	0.0
1511	-0.	-0.	-.0	0.0	0.0
1512	-0.	-0.	-.0	0.0	0.0
1513	-0.	-0.	-.0	0.0	0.0
1514	-0.	-0.	-.0	0.0	0.0
1515	-0.	-0.	-.0	0.0	0.0
1516	-0.	-0.	-.0	0.0	0.0
1517	-0.	-0.	-.0	0.0	0.0
1518	-0.	-0.	-.0	0.0	0.0
1519	-0.	-0.	-.0	0.0	0.0
1520	-0.	-0.	-.0	0.0	0.0
1521	-0.	-0.	-.0	0.0	0.0
1522	-0.	-0.	-.0	0.0	0.0
1523	-0.	-0.	-.0	0.0	0.0
1524	-0.	-0.	-.0	0.0	0.0
1525	-0.	-0.	-.0	0.0	0.0
1526	-0.	-0.	-.0	0.0	0.0
1527	-0.	-0.	-.0	0.0	0.0
1528	-0.	-0.	-.0	0.0	0.0
1529	-0.	-0.	-.0	0.0	0.0
1530	-0.	-0.	-.0	0.0	0.0
1531	-0.	-0.	-.0	0.0	0.0
1532	-0.	-0.	-.0	0.0	0.0
1533	-0.	-0.	-.0	0.0	0.0
1534	-0.	-0.	-.0	0.0	0.0
1535	-0.	-0.	-.0	0.0	0.0
1536	-0.	-0.	-.0	0.0	0.0
1537	-0.	-0.	-.0	0.0	0.0
1538	-0.	-0.	-.0	0.0	0.0
1539	-0.	-0.	-.0	0.0	0.0
1540	10.	10.	10.0	0.0	0.0
1541	10.	10.	10.0	0.0	0.0
1542	11.	10.	10.4	.4	-.4
1543	11.	11.	10.8	-.2	.2
1544	11.	11.	10.8	-.3	.3
1545	10.	11.	10.8	-.4	.4
1546	10.	12.	11.3	-.3	.8
1547	11.	12.	11.7	-.5	.6
1548	11.	13.	11.6	-.9	.9
1549	11.	12.	11.8	-.7	.7
1550	11.	13.	11.7	-.3	.8
1551	11.	12.	11.5	-.6	.6

RUN NO 5B (CONTINUED) OBSERVER PATH LENGTH — OBSERVED PATH LENGTH

TIME	AVERAGE OPACITY PLCHR	AVERAGE OPACITY SNYDR	OBSERVER AVERAGE	OBSERVER DEVIATION PLCHR	OBSERVER DEVIATION SNYDR
1552	11.	12.	11.5	-.4	.4
1553	11.	12.	11.-	-.5	.6
1554	11.	12.	11.3	-.4	.4
1555	11.	12.	11.4	-.7	.7
1556	11.	13.	11.6	-.3	.9
1557	11.	13.	11.9	-.4	.8
1558	11.	13.	11.7	-.8	.8
1559	11.	13.	11.9	-1.1	1.1
1600	10.	13.	11.9	-1.5	1.5
1601	11.	13.	12.7	-1.0	1.0
1602	11.	14.	12.5	-1.1	1.9
1603	11.	14.	12.5	-1.5	1.5
1604	11.	14.	12.6	-1.6	1.6
1605	11.	14.	12.8	-1.5	1.6
1606	12.	14.	13.0	-1.4	1.4
1607	10.	14.	12.3	-1.9	1.9
1608	10.	14.	11.9	-1.9	1.9
1609	10.	14.	12.0	-2.0	2.0
1610	-0.	14.	6.9	-6.9	6.9
1611	-0.	14.	6.9	-6.9	6.9
1612	-0.	14.	7.0	-7.0	7.0
1613	-0.	14.	6.8	-6.8	6.8
1614	-0.	14.	6.8	-6.8	6.8
1615	10.	14.	11.8	-1.8	1.8
1616	10.	14.	11.9	-1.9	1.9
1617	10.	14.	12.0	-2.0	2.0
1618	11.	14.	12.3	-1.7	1.7
1619	12.	15.	13.-	-1.5	1.5
1620	11.	14.	12.9	-1.5	1.5
1621	11.	14.	12.8	-1.4	1.4
1622	12.	14.	13.0	-1.4	1.4
1623	12.	14.	13.1	-1.3	1.3
1624	11.	14.	12.9	-1.5	1.5
1625	11.	14.	12.6	-1.9	1.8
1626	11.	15.	12.9	-1.9	1.9
1627	11.	15.	13.1	-2.1	2.1
1628	11.	15.	13.1	-2.3	2.3
1629	11.	15.	13.4	-2.0	2.0
1630	12.	15.	13.5	-1.7	1.7
1631	12.	15.	13.4	-1.8	1.8
1632	11.	15.	13.2	-2.0	2.0
1633	12.	15.	13.3	-1.7	1.7
1634	12.	15.	13.4	-1.4	1.4
1635	11.	15.	13.2	-2.0	2.0
1636	11.	16.	13.2	-2.4	2.4
1637	11.	16.	13.4	-2.2	2.2
1638	12.	16.	13.6	-2.0	2.0
1639	12.	16.	13.8	-2.1	2.1
1640	12.	16.	13.8	-2.1	2.1
1641	12.	15.	13.5	-1.9	1.9
1642	12.	15.	13.5	-1.9	1.9
1643	12.	15.	13.2	-1.6	1.6
1644	11.	15.	13.0	-1.8	1.8
1645	11.	15.	12.7	-1.9	1.9
1646	10.	14.	12.4	-2.1	2.0
1647	11.	14.	12.6	-1.8	1.8
1648	11.	14.	12.5	-1.5	1.5
1649	11.	14.	12.3	-1.7	1.7
1650	11.	13.	12.1	-.6	.6
1651	12.	14.	12.9	-.6	.6
1652	13.	15.	14.1	-.9	.9
1653	14.	16.	14.8	-1.3	1.3
1654	14.	17.	15.6	-1.5	1.5
1655	15.	19.	16.8	-1.8	1.8
1656	15.	20.	17.6	-2.6	2.6
1657	15.	20.	17.7	-2.3	2.3
1658	16.	20.	17.7	-1.9	1.9
1659	16.	19.	17.5	-1.7	1.7
1700	16.	19.	17.5	-1.7	1.7
1701	16.	19.	17.7	-1.5	1.5
1702	17.	20.	18.1	-1.5	1.5
1703	17.	20.	18.4	-1.4	1.4
1704	18.	20.	18.5	-1.3	1.0
1705	18.	20.	19.1	-.7	.7
1706	19.	20.	19.5	-.3	.3
1707	21.	20.	20.4	.4	-.4
1708	22.	20.	21.0	.0	-.6
1709	21.	20.	20.8	.4	-.4

APPENDIX C

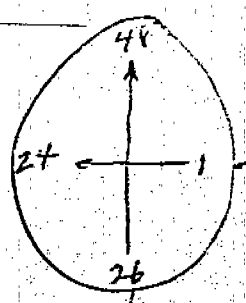
FIELD AND LABORATORY DATA RELATED TO PARTICULATE SAMPLING

Preliminary Data
Sample Run Data
Molecular Weight Calculations
Field Analytical Data
Sample Drying Data
Visable Emission Field Data
Cyclone Field Data

Preliminary Data

Velocity Traverse Data - Inlet

PLANT Northumberland Coal
DATE 6/17/75
LOCATION Venturi inlet
STACK I.D. 72"
BAROMETRIC PRESSURE, in. Hg
STACK GAUGE PRESSURE, in. H_2O 29" H_2O
OPERATORS Tuttle, Turner, Strayer



SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
1	–	–
2	4	185
3	4 7/8	180
4	5 1/2	185
5	5 1/4	185
6	4	185
7	3	185
8	2 1/2	185
9	2 1/4	185
10	2	185
11	2 1/8	185
12	1 7/8	185
13	1 3/4	180
14	2	185
15	2 5/8	185
16	3 1/4	185
17	4	185
18	4 3/4	185
19	4 7/8	185
20	5 1/2	185
21	5 3/4	185
22	5 3/4	185
23		
24	–	–
AVERAGE		

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
25	–	–
26	4 1/2	180
27	4 3/4	197
28	5 1/2	200
29	5	200
30	4 1/4	200
31	3	200
32	2 1/4	200
33	1 3/4	200
34	1 1/2	199
35	1 1/2	200
36	1 7/8	200
37	2 3/8	200
38	2 3/4	200
39	2 3/4	205
40	3	200
41	2 3/8	205
42	2 1/2	205
43	2 3/8	205
44	2 1/2	205
45	2 3/8	205
46	2 1/4	200
47	2	200
48	–	–
AVERAGE		

No point missed during traverse

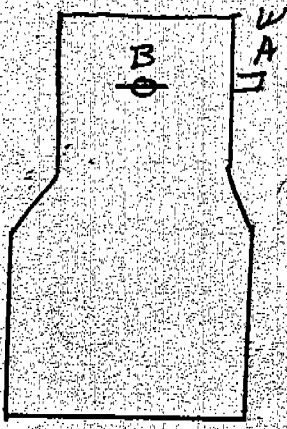
EPA (Dur) 233
4/72

Points 1, 24, 25, 48 NOT Taken; < 1" from stack wall

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Westmoreland Coal Company
DATE 6/17/75
SAMPLING LOCATION Thermal Coal Dryer Outlet.
INSIDE OF FAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE A) 85 3/4"
INSIDE OF NEAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE B) 5"
STACK I.D., (DISTANCE A - DISTANCE B) 80 3/4"
NEAREST UPSTREAM DISTURBANCE 2.97 = 3 dia
NEAREST DOWNSTREAM DISTURBANCE 2.71 = 2.7 dia
CALCULATOR C. E. Riley

42 traverse points changed to 44 points due to FD data



SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF NIPPLE (SUM OF COLUMNS 4 & 5)
1	1.1	80 3/4"	.89 = 1.0	5"	6.0
2	3.5		2.83		7.83
3	6.0		4.85		9.85
4	8.7		7.03		12.03
5	11.6		9.37		14.37
6	14.6		11.8		16.8
7	18.0		14.5		19.5
8	21.8		17.6		22.6
9	26.1		21.1		26.1
10	31.5		25.5		30.5
11	39.3		31.7		36.7
12	60.7		49.0		54.0
13	68.5		55.3		60.3
14	73.9		59.7		64.7
15	78.2		63.2		68.2
16	82.0		66.2		71.2
17	85.4		69.0		74.0
18	88.4		71.4		76.4
19	91.3		73.8		78.8
20	94.0		75.9		80.9 81.
21	96.5		78.0		83.0
22	98.9	80 3/4"	79.9 = 79.7	5"	84.7

Velocity Traverse Data-Outlet

PRELIMINARY VELOCITY TRAVERSE

C-3

Wood Veneer

PLANT Westmoreland Coal Company

DATE 6/17/75

LOCATION Outlet Stack

STACK I.D. 80 3/4"

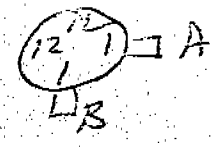
BAROMETRIC PRESSURE, in. Hg 27.46

STACK GAUGE PRESSURE, in. H_2O 0.15

OPERATORS Battelle, EPA

Traversed stack using Westmoreland probe & pitot probe No. 6.

Test before EPA traverse



SCHEMATIC OF TRAVERSE POINT LAYOUT

1545 - 1550

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Port A 1	1.5	110
2	2.5	
3	3.0	
4	3.0	
5	3.0	
6	2.5	
7	1.5	
8	1.5	
9	1.0	
10	1.2	
11	1.5	
12	1.5	112
AVERAGE		

1605 to 1609

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Port B 1	0.8	115
2	0.8	
3	1.1	
4	1.5	
5	1.5	
6	2.0	
7	2.0	
8	2.2	
9	2.5	
10	2.5	
11	2.7	
12	2.5	115
AVERAGE		

EPA 1 Jun 83
4 72

Temperature recorded from [illegible] Battelle pitot mounted thermocouple placed at a single position.

PRELIMINARY VELOCITY TRAVERSE

Wood Veneer

C-4

PLANT Westmoreland Coal Company
DATE 6/17/75
LOCATION Outlet stack
STACK I.D. 80 24"
BAROMETRIC PRESSURE, in. Hg 27.46
STACK GAUGE PRESSURE, in. H_2O 0.15
OPERATORS Battelle + EPA

SCHEMATIC OF TRAVERSE POINT LAYOUT

1555 1603

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Port A 1	1.5	112
2	1.8	115
3	2.2	↑
4	2.5	
5	2.5	
6	2.7	
7	2.5	
8	3.0	
9	3.0	
10	2.9	
11	2.7	
12	1.5	
13	1.7	
14	1.0	
15	1.0	
16	1.2	
17	1.4	
18	1.5	
19	1.5	
20	1.5	
21	1.7	↓
22	1.3	115
	42.4	
AVERAGE	~~1.7~~ 1.9	115

1609 1615

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Port B 1	0.80	115
2	0.70	↑
3	1.0	
4	1.0	
5	1.2	
6	1.5	
7	1.4	
8	1.5	
9	1.7	
10	1.7	
11	2.0	
12	2.0	
13	1.8	
14	1.8	
15	1.8	
16	2.2	
17	2.5	
18	2.2	
19	2.5	
20	2.5	↓
21	2.2	115
22	2.0	112
	38.0	
AVERAGE	1.7	115

1.8 — 115

EPA (Dum 233
4-72

PRELIMINARY VELOCITY TRAVERSE Wood Vanes

C-5

Traversed stack using West pitot & probe No. 6

PLANT Westmoreland Coal
DATE 6/17/75
LOCATION Outlet Stack
STACK I.D. 80 3/4"
BAROMETRIC PRESSURE, in. Hg 27.46
STACK GAUGE PRESSURE, in. H_2O 0.18
OPERATORS

after EPA Traverse

SCHEMATIC OF TRAVERSE POINT LAYOUT

1621 1627

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Port A1	1.7	111
2	2.2	115
3	2.5	↑
4	2.7	
5	3.0	
6	2.7	
7	1.5	
8	1.3	
9	1.2	
10	1.4	↓
11	1.5	115
12	2.0	114
AVERAGE		

1618 1620

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Port B1	0.8	112
2	1.0	115
3	1.2	↑
4	1.4	
5	1.5	
6	2.0	
7	2.2	
8	2.0	
9	2.2	
10	2.5	↓
11	2.5	115
12	2.5	112
AVERAGE		

Pitot liner blown out before reading measurements.

Thermocouple readings from EPA pitot type

EPA (Dur) 283
4 72

PRELIMINARY VELOCITY TRAVERSE

C-6

Metal Veneer

PLANT Westmoreland Coal

DATE 6/18/75

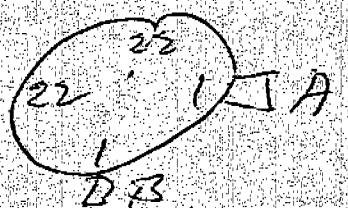
LOCATION Outlet Stack

STACK I.D. 80 3/4"

BAROMETRIC PRESSURE, in. Hg 27.54

STACK GAUGE PRESSURE, in. H_2O 0.12

OPERATORS EPA, Battelle



SCHEMATIC OF TRAVERSE POINT LAYOUT

1150 1200

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
BotA1	1.2	118
2	1.5	118
3	1.7	118
4	1.7	120
5	2.0	118
6	2.0	〃
7	2.0	〃
8	2.0	〃
9	1.9	〃
10	2.0	〃
11	1.8	〃
12	1.8	〃
13	1.5	118
14	1.6	120
15	1.4	130
16	1.4	120
17	1.4	118
18	1.5	〃
19	1.5	〃
20	1.5	〃
21	1.4	〃
22	1.1	118
	35.8	
AVERAGE	1.6	118

1.5

1.5

1200 1210

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
BotB1	0.7*	118
2	0.7*	〃
3	0.7*	〃
4	1.0	〃
5	1.1	118
6	1.2	120
7	1.2	120
8	1.3	120
9	1.5	118
10	1.7	118
11	1.7	122
12	1.7	122
13	1.7	122
14	1.7	122
15	1.7	122
16	1.7	122
17	1.5	122
18	1.7	122
19	2.0	122
20	1.5	118
21	1.5	118
22	1.2	118
	36.7	120
AVERAGE	0.14	119

EPA (Dun 233
4-72

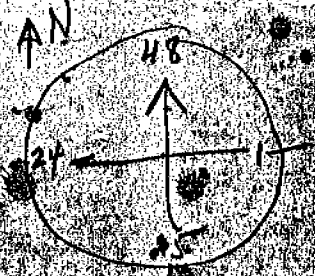
* 5.4 in. of water displayed on pitot gauge — pitot tube.

Sample Run Data

FIELD DATA

Thimble = 102.4000
Filter = 0.3577
0.3776

PLANT Westmoreland Coke
DATE 6.18.75
SAMPLING LOCATION Inlet Venturi
SAMPLE TYPE Pos + Size
RUN NUMBER 1
OPERATOR Dick
AMBIENT TEMPERATURE 90
BAROMETRIC PRESSURE 27
STATIC PRESSURE (P_s) -29" H_2O
FILTER NUMBER



PROBE LENGTH AND TYPE 8' glass
NOZZLE I.D. 0.17
ASSUMED MOISTURE % 4
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$ 1.7"
C FACTOR 1.1
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE ΔP 2.3

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY ___ MINUTES Last 17 pts 2 min

Sample Gas - Inlet

TRAVERSE POINT NUMBER	SAMPLING TIME (min)	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m, ft³)	VELOCITY HEAD (Δp, in. H_2O)	ORIFICE PRESSURE DIFFERENTIAL (ΔH, in. H_2O) DESIRED	ACTUAL	STACK TEMPERATURE (T_s, °F)	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$, °F)	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$, °F)	PUMP VACUUM (in. Hg)	SAMPLE BOX TEMPERATURE °F	IMPINGER TEMPERATURE °F
			188.0									
2.7	Start	1825	192.4	0.5	5.0	4.7	208	1.496	1.182	15	318	0.9
5.5	4	1829	195.1	1.5	3.6	3.6	199	1.496	1.184		186	0.9
8.3	8	1833	199.3	5.5	3.4	3.6	189	1.495	1.284		185	0.9
3.0	12	1834	204.7	4.0	3.1	3.1	193	1.341	1.184		180	0.8
3.05	16	1837	206.7	4.0	3.1	3.1	194	1.495	1.184		185	0.62
4.3	20	1840	208.6	3.5	3.0	3.1	198	1.496	1.184		189	62
4.3	24	1843	212.9	3.0	2.3	2.3	201	1.8	1.1		190	60
3.1	28	1846	214.4	2.5	1.9	1.9	199	1.1	1.1		190	59
1.6	32	1849	215.4	2.0	1.6	1.6	198				192	59
1.85	36	1852	217.3	2.0	1.6	1.6	199	1.115	1.6	3		59
1.4	40	1855	(STOP @ 1900)	1.5	1.2	1.2	203	1.115	1.6		207	59
2.3	1.30	1858	221.0	3.0	2.3	2.3	186	(STOP		Cross over		Tube broken
		1907	222.3					(Process out & cool for about 5 min)				
	Start	1916	1918 - STOP									
3.1	Start	1935	225.3	3.0	2.7	2.3	189	1.9	1.7		196	52
3.2		1938	228.0	4.0	3.1	3.1	185	1.6	1.6		194	52
4.3		1941	232.7	4.0	3.1	3.1	194	1.7	1.7	6	189	58
4.4		1944	238.2	3.0	2.3	2.3	196	1.6	1.8	6	194	62
4.5		1947	236.3	3.0	2.3	2.3	202	1.9	1.8	6	207	61
4.6		1950	239.2	3.0	2.3	2.3	204	2.0	1.8	6	203	60
4.7		1953	242.0	3.0	2.3	2.3	203	2.0	1.8	5	198	60
4.8		1956	244.7	1.5	1.2	1.2	202	2.0	1.8	3	194	60
4.9		1959	246.4	1.0	0.62	0.62	207	2.0	1.8	2	208	58

COMMENTS: Readings taken from both Venturis due to broken cross over tube

EPA (Dur) 235
4-72

C18

[redacted] POINT NUMBER	SAMPLING TIME, min / CLOCK (24-hr CLOCK)	[redacted] GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	[redacted] ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		[redacted] STACK TEMPERATURE, (T_s), °F	[redacted] DRY GAS METER TEMPERATURE		[redacted] PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	[redacted] IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
		246.4									
10	2002	247.3	0.5	0.4	0.4	465	203	185	0.5	375	+9
11	2005	247.3	0.5	0.8	0.8	475	205	195	0.5	375	
12	2008	249.8 (2.5)	0.5	0.4	0.4	510	195	195	0	365	+9
	2011										
	T=36	249.8	1.45	3.5	3.5	472	201	200	1.2	373	
1	2052	254.6 (4.8)	1.45	3.5	3.5	476	208	188	1.2	373	
2	2055	258.7 (4.1)	1.50	2.100	Probe Stuck						
Start	T=3 2058	260.0									
27 Start #3	Stop 2102 2106	262.8 (2.8)	1.45	4.5	4.5	234					
28 4	2102 2106	266.0	1.50	4.0	3.5	478	202	188		402	
29 5	2112 2116	269.0	3.0	3.9	3.5	497	208	188	1.5	402	
30 6	2115 2120	272.0	3.0	3.9	3.3	498	208	188	1.6	405	
31 7	2118	275.0	3.75	2.9	2.9	502	214	197	1.5	402	
32 8	2121	278.5	3.5	2.3	2.3	498	210	193	1.3	401	
33 9	2124	281.6	2.5	1.9	1.9	498	211	197	1.1	402	
34 10	2127	283.3	2.0	1.6	1.6	243					
35 11	2130	285.2	2.0	1.6	1.6	243					
36 12	2133	287.8 (2.6)	1.75	1.4	1.4	522	218	197	1.0	425	
	2136 Stop										
	T=33	287.8									
37 13	2145 Start	288.9 (1.1)	0.5	2.0	2.0	214					
38 14	2147	290.3 (1.4)	2.25	1.8	1.8	544					
39 15	2149	291.8 (1.5)	2.5	2.0	2.0	550	222	197	6.0	416	
40 16	2151	293.5 (1.7)	3.0	2.3	2.3	536	230	197	2.0	417	
41 17	2153	295.4 (1.9)	3.0	2.1	2.1	553	240	197	2.0	417	
42 18	2155	297.69 (2.29)	3.0	2.3	2.3	553	240	197	2.0	417	
43 19	2157	298.8 (1.1)	3.0	2.3	2.3	565	228	200	2.0	416	
44 20	2159	300.6 (1.8)	3.0	2.3	2.3						
45 21	2201	302.4 (1.8)	3.0	2.3	2.3	554	228	200	1.0	417	
46 22	2203	304.3 (1.9)	3.10	2.3	2.3						
47 23	2205	306.2 (1.9)	3.0	2.3	2.3	571	230	200	1.0	417	
48 24	2207	307.6 (1.4)	3.0	2.3	2.3						
	2209										
		1.3									

ΣV_m = 61.2

Total T = 128

EPA (Dec) 2
4-72

#1 Run

Tube broken. No outlet temp. reading. < 30 from previous test.

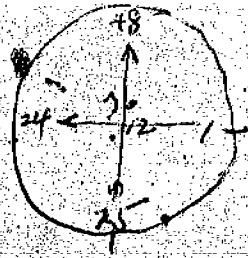
C-9

FIELD DATA

Thimble = 88.25 [illegible]

Filter = 0.3606

PLANT Westmoreland Coal Co
DATE 6/19/75
SAMPLING LOCATION inlet Venturi
SAMPLE TYPE Part Mass
RUN NUMBER 2
OPERATOR [illegible]
AMBIENT TEMPERATURE 80 F
BAROMETRIC PRESSURE 27.032
STATIC PRESSURE, (P_s) 29.[illegible] H_2O
FILTER NUMBER (s)



PROBE LENGTH AND TYPE 8' [illegible]
NOZZLE I.D. 0.17
ASSUMED MOISTURE, % 10 [illegible] #1
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$ 1.72
O FACTOR 1.0
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp 2.7

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F MV	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F MV	OUTLET ($T_{m\,out}$), °F MV	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
		307.8									
1	13 ~~14~~57	309.9	5.0	3.2	3.2	2.8 158					
2	~~15~~59		6.0	4.0	4.0	158					
3	14 ~~15~~01	314.4	5.5	3.8	3.8	3.0 167	1.4 95	1.2 96	10	3.0 167	57
4	~~15~~03		5.5	3.8	3.8	167					
5	~~15~~05	318.6	5.0	3.3	3.3	3.2 176	1.5 99	1.0 77	8	3.2 176	64
6	~~15~~07		4.5	3.1	3.1	176					
7	~~15~~09	320	4.0	2.7	2.7	3.2 176	1.6 104	1.2 80	5.5	3.5 190	[illegible]
8	~~15~~11	323.1	3.0	2.0	2.0	176					
9	~~15~~13	3	3.0	2.0	2.0	3.2 176	1.4 95	1.0 77		3.[illegible] 203	
10	~~15~~15	326.5	2.0	1.4	1.4	176					
11	~~15~~17	327.6	2.0	1.4	1.4	3.5 190	1.5 99	1.0 77	7.0	3.7 198	64
12	~~15~~19	329.1	2.0	1.4	1.4	190					
	Stop ~~15~~21	330.2									
		330.2									
13	1430	331.0	2.0	1.4	1.4	194					
14	1432		2.0	1.4	1.4	3.6 194	1.2 86	1.2 86	1.1	4.2 221	
15	1434	333.1	2.0	1.4	1.4	194					
16	1436	334.4	3.0	2.1	2.1	194					
17	1438	336.2	3.0	2.1	2.1	3.6 194	1.3 91	1.1 82	2.5	4.4 230	64
18	1440	338.2	3.0	2.1	2.1	194					
19	1442	340.5	4.5	3.0	3.0	3.2 176	1.3 91	1.0 77		4.5 234	
20	1444	343.0	5.5	3.8	3.8	176					
21	1446	344.2	6.0	4.0	4.0	3.4 186	1.4 95	1.1 82	10	4.4 230	

COMMENTS:

EPA (Dur) 235
4-72

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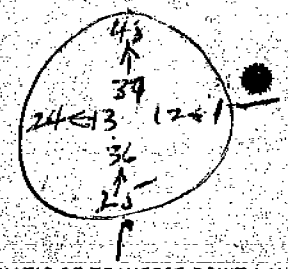
TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE °F
					DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
			344.2									
22		1448		6.8	4.0	4.0	176					
23		1452	348.	6.0	4.0	4.0	176	1.391	1.077	10.5	4.4 230	68
24	(11)	1457	356.0	6.0	4.0	4.0	176			11		67
		1454										
			351.0									
1	Start	1500	352	2.0	1.4	1.4	171					
2		1508	353.7	2.5	1.7	1.7	171					57
3		1512	355.7	2.5	1.7	1.7	171	1.182	0.973	1.0	3.5 189	
4		1517	357.8	3.0	2.0	2.0	171					57
5		1524		2.5	1.7	1.7	163	NOT		0.8	3.8 203	
6		1529	359.9	2.5	1.7	1.7	163					
7		1529	361.7	2.5	1.7	1.7	163					
8		1530	363.5	2.5	1.7	1.7	156	0.973	0.756	3.0	3.8 203	
9	(12)	1532	364.7	2.0	1.4	1.4	156					
10		1534	366.1	2.0	1.4	1.4	156	0.857	0.656	2.5	2.7 197	
11		1536	368.2	2.0	1.4	1.4	169					
12		1538	368.7	2.0	1.4	1.4	169					
		1540										
			368.7									
13	Start	1549	371.0	3.0	2.0	2.0	133					
14		1551	374.0	3.5	2.4	2.4	133	1.182	0.868	5.0	4.2	52
15		1553		4.0	2.7	2.7	133					
16		1555	377.0	4.0	2.7	2.7	140	1.182	0.868	6.0	6.0 209	
17		1557		4.0	2.7	2.7	140					
18	(11)	1559	380.8	4.0	2.7	2.7	149	1.281	0.868	6.0	3.6 194	66
19		1601	383.0	3.5	2.4	2.4	149					
20		1603	385.3	3.0	2.0	2.0	151	1.077	0.868	5.0	3.4 185	
21		1605	386.0	2.5	1.7	1.7	151					68
22		1607	387.4	2.0	1.38	1.38	155	1.281	0.764	1.0	3.4 185	
23		1609	388.0	1.5	1.05	1.05	155					
24		1611	389.6	1.5	1.05	1.05	162	1.182	0.868	1.5	3.4 185	65
	Stop	1613										
			388									

EPA (Oct 236 4 72

C-11

FIELD DATA

PLANT Westmoreland
DATE 6/20/75
SAMPLING LOCATION
SAMPLE TYPE
RUN NUMBER 4
OPERATOR Wilt, Trayser, Hupp
AMBIENT TEMPERATURE 86
BAROMETRIC PRESSURE 27.57
STATIC PRESSURE, (P_s) 29.40
FILTER NUMBER (s)



SCHEMATIC OF TRAVERSE POINT LAYOUT

PROBE LENGTH AND TYPE
NOZZLE I.D. 0.17
ASSUMED MOISTURE, % 10
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$ 1.72
C FACTOR 0.95
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp 2.35

READ AND RECORD ALL DATA EVERY 2 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
		420.9									
37	1503	422.8	2.5	1.95	1.95	2.9 161	0.7	0.6	2	1.9	
38	1505	424.5	2.5	1.95	1.95	3.0 165					
39	1507	426.2	3.0	2.3	2.3	3.0 165	0.75	0.55	3½	2.7	50
40	1509	428.1	3.0	2.3	2.3	2.85 161					
41	1511		3.0	2.3	2.3	2.8 156	0.85	0.5		3.1	52
42	1513	432.0	3.0	2.3	2.3	*3.25 175					
43	1515	433.2	2.5	1.95	1.95	3.25 175	1.3	0.85	3	3.7	
44	1517		2.5	1.95	1.95	3.25 175					
45	1519	436.7	2.5	1.95	1.95	3.25 175	1.35	0.95		4.0	
46	1521		2.5	1.95	1.95	3.2 173					
47	1523	439.7	2.0	1.6	1.6	3.3 173	1.35	0.95	2	3.9	58
48	1525	441.1	2.0	1.6	1.6	3.3 173					
	1527	STOP									
		441.1									
25	1536	443.9	3.5	2.8	2.8	2.8 155			5.0	~~5.0~~	
26	1538	446.2	4.5	3.5	3.5	2.8 155	1.3	1.0		4.0	
[illegible]	1540	448.2	5.5	4.2	4.2	3.0 165			9		
27	1542	450.9	6.0	3.7	3.7	2.9 161	1.4	0.9		3.8	
[illegible]	1544	453.0	4.5	3.5	3.5	2.9 161					60
30	1546	455.6	4.0	3.1	3.1	3.0 165	1.3	0.9	6	3.9	
31	1548	457.4	4.25	3.2	3.2	3.2 174				2	
[illegible]	1550	459.0	2.75	2.2	2.2	3.2 174	1.4	1.0	4	4.0	
[illegible]	1552	460.7	2.25	1.75	1.75	3.45 181					

32

22

COMMENTS: [illegible] pot for 82F reference (ambient)

EPA (Our) 4-72

C-12

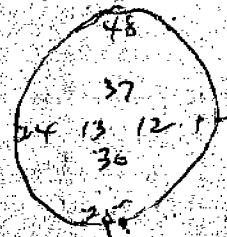
TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
			460.7									
34		1554	462.1	2.0	1.6	1.6	3.5 186			2.0		
35		1556	463.3	1.5	1.2	1.2	3.4 182	1.5	1.1		4.1	
36		1558	464.5	1.5	1.2	1.2	3.3 177					
39		1600										
			464.5									
13		1622	466.1	1.5	1.2	1.2	3.2 172					
14		1624	467.3	1.5	1.2	1.2	3.4 182	1.2	1.1		3.6	
15		1626	469.1	1.5	1.2	1.2	3.1 169					
16		1628	470.3	2.0	1.6	1.6	3.3	1.3	1.0	1.0	3.6	56
17		1630	472.1	2.5	1.9	1.9	3.2					
18		1632	475.6	3.0	2.3	2.3	3.2	1.4	1.0	1.0	3.9	
19		1634	477.9	4.0	3.0	3.0	3.3			3.8		
20		1636	480.6	4.5	3.5	3.5	3.3	1.5	1.0		3.9	60
21		1638	480.6	5.0	3.8	3.8	3.3					
22		1640	482.8	5.5	4.1	4.1	3.3	1.6	1.0		4.0	
23		1642	485.2	6.0	4.5	4.5	3.2					
24		1644	487.2	5.5	4.1	4.1	3.6	1.6	1.1	8.0	4.0	63
		1646	STOP									
			487.2									
1		1655	489.3	4.5	3.3	3.3	2.6 147					
2		1657	492.3	5.5	4.0	4.0	2.7 151	1.2	1.1	5.0	3.9	57
3		1659		6.0	4.5	4.5	2.9 160	1.3	1.1	4.0	4.0	
4		1701	496.9	5.0	3.8	3.8	2.9 160	1.2	1.0	5	3.9	
5		1703	500.0	5.0	3.8	3.8	3.0					
6		1705		3.5	2.8	2.8	3.2 169	1.4	1.1	5	3.9	
7		1707	503.7	4.0	3.0	3.0	3.3 177					
8	Probe stack	1709	505.3	2.5	2.0	2.0	3.1 169					64
9		1711	505.6	2.5	2.0	2.0	3.1 169	1.4	1.1	3	4.0	
10		1713	507.7	2.0	1.6	1.6	3.3 177					
11		1715	508.9	1.5	1.2	1.2	3.5 166	1.2	1.1	1	4.0	63
12		1717	512.3	1.5	1.2	1.2	3.6 191					
1		1719										
						121.65 / 48		516 / 46				
	T=96		V_m=90.4			2.53		1.12				
								82F				

EPA (Dur) 236
4 72

C-13

FIELD DATA

PLANT Westmoreland
DATE 6/23/75
SAMPLING LOCATION Inlet to Venturi
SAMPLE TYPE Part. Size, Mass
RUN NUMBER 5
OPERATOR Webb
AMBIENT TEMPERATURE 70
BAROMETRIC PRESSURE 29.68
STATIC PRESSURE, (P_s) 29"H2O
FILTER NUMBER (s)



SCHEMATIC OF TRAVERSE POINT LAYOUT

PROBE LENGTH AND TYPE
NOZZLE I.D. 0.175
ASSUMED MOISTURE, % 12
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$ 1.72
C FACTOR 0.95
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
					DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
			512.2									
37	0	1608	515.4	2.0	1.7	1.7	210	80	75	2.0	200	
38	3	1611	518.6	2.5	2.1	2.1	210	85	80	2.0	210	52
39	6	1614	521.8	2.5	2.0	2.0	215	100	90	1.5	210	
40	9	1617	524.1	2.5	2.1	2.1	220	100	90	1.5	215	54
41	12	1620	526.7	3.0	2.4	2.4	225	105	95	1.5	220	
42	15	1623	529.3	3.0	2.4	2.4	230	105	95	1.5	220	
43	18	1626	532.4	3.0	2.4	2.4	230	110	95	1.5	230	
44	21	1629	534.5	2.5	2.0	2.0	230	110	95	1.5	240	
45	24	1632	537.5	2.5	2.0	2.0	230	110	95	1.5	250	54
46	27	1635	539.5	2.5	2.0	2.0	230	110	95	1.5	250	
47	30	1638	542.7	2.5	2.0	2.0	230	110	95	1.5		
48	33	1641	545.5	2.5	2.0	2.0	230	110	95	1.5		
	35	1644										
			545.9									
25	0	1656	548.9	3.0	2.0	2.0	230	95	90	1.1	250	54
26	3	1659	552.5	3.5	2.5	2.5	230	100	90	1.1	250	
27	6	1702		3.0	2.1	2.1	230	100	95	1.1	250	
28	9	1705	558.3	3.0	2.1	2.1	230	100	95	1.1	250	57
29	12	1708	561.7	3.5	2.5	2.5	230	100	95	1.1	250	
30	15	1711	564.2	3.0	2.3	2.3	230	100	95	1.1	250	60
31	18	1714	567.0	3.0	2.3	2.3	230	100	95	1.1	250	
32	21	1717	570.3	3.5	2.6	2.6	230	100	95	1.1	250	
33	24	1720	573.7	3.5	2.6	2.6	230	100	95	1.1	250	

COMMENTS: Add P.T. to be taken next run

EPA (Dur) 233
4-72

C-14

[redacted] POINT NUMBER	SAMPLING TIME, min	[redacted] LOC[redacted] (24-hr CLOCK)	[redacted] S ME[redacted] EAD[redacted] (V_m), ft^3	[redacted] ITY HEAD (Δp_s), in. H_2O	[redacted] RIFI[redacted] DIFFERE[redacted] AL (ΔH), in. H_2O DESIRED	ACTUAL	[redacted] TEMPERATURE (T_s), °F	[redacted] RY G[redacted] TER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUM[redacted] VACUUM in Hg	SA[redacted] BOX TEMPERATURE, °F	[redacted] IMP[redacted] TEMPE[redacted] URE
			574.7									
34	21	1723	577.8	2.5	2.1	2.1	212	100	90	8.0	260	
35	30	1726	580.0	2.25	1.9	1.9	215	100	92	8.0	260	
36	33	1729	582.4	2.0	1.8	1.8	220	100	95	8.0	260	62
	36	1732	Leak check					2054/22 = 93.4				
			582.6	1.5	1.25	1.25	200	80	80		170	
13	0	1804	585.0	1.5	1.25	1.25	200	80	80	1.0	170	
14	3	1807	587.0	1.5	1.25	1.25	190	80	80	1.0	180	
15	6	1810	589.3	1.5	1.25	1.25	200	80	80	1.0	200	54
16	9	1813		2.0	1.7	1.7	190	80	80			
17	12	1816	594.1	2.5	2.0	2.0	210	85	85	2.0	225	
18	15	1819	597.0	3.0	2.5	2.5	200	88	82	4.5	225	
19	18	1821	599.8	3.5	2.9	2.9	210	95	85	5.0	232	
20	21	1824	603.3	4.0	3.4	3.4	215	100	85	7.2	235	
21	24	1827	608.0	5.0	4.2	4.2	210	100	85	10.5	238	63
22	27	1830	611.0	5.25	4.4	4.4	205	100	85	11.5	240	
23	32	1833	614.0	5.5	4.7	4.7	210	100	85	12.5	240	64
24	33	1836	617.2	5.5	4.7	4.7	196	100	80	15.0	240	
	36	1839	Leak check					2080/	86.7			
			Changed filter					Changed filter			Thermble leaking	
			617.5	4.5	3.8	3.8						
1	0	1907	621.7	4.5	3.8	3.8	170	90	85	5.5	215	
2	3	1910	625.3	5.0	4.1	4.1	170	90	80	8.0	215	59
3	[redacted]	1913	628.8	5.0	4.1	4.1	175	100	80	8.0	220	
4	[redacted]	1916	631.9	4.0	3.3	3.3	180	100	80	7.5	225	
5	12	1919	635.8	4.0	3.3	3.3	180	105	82	8.0	230	
6	15	1921	638.4	3.5	2.95	2.95	185	110	82	7.5	240	
7	18	1924	641.3	3.0	2.5	2.5	185	110	85	7.2	241	66
8	21	1927	643.9	2.5	2.0	2.0	185	110	82	6.0	240	
9	24	1930	645.9	2.0	1.7	1.7	180	110	85	4.5	240	63
10	27	1933	648.2	2.0	1.7	1.7	180				240	
11	30	1936	650.5	2.0	1.7	1.7	190	110	85	2.0	242	
12	33	1939	652.7	2.0	1.7	1.7	195	110	85	2.0	240	
13	36	1941										
						128.55		2061/22 = 92.7				
	T=144		V_m=140.0			48						

48
144

ΔH=2.68

371/42

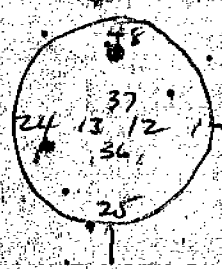
T_s=292.8

EPA (Dur) 236
4 72

C-15

FIELD DATA

PLANT Westmoreland Coal
DATE 6/25/75
SAMPLING LOCATION Inlet to Precip
SAMPLE TYPE Part Size, Mass
RUN NUMBER 6
OPERATOR Clark Hipp, Trayser
AMBIENT TEMPERATURE 85°
BAROMETRIC PRESSURE 29.64
STATIC PRESSURE, (P_s)
FILTER NUMBER (s)



SCHEMATIC OF TRAVERSE POINT LAYOUT

PROBE LENGTH AND TYPE 8' Glass + Pitot
NOZZLE I.D. 0.175
ASSUMED MOISTURE, % 12
SAMPLE BOX NUMBER
METER BOX NUMBER 5
METER $\Delta H_@$ 1.72
C FACTOR 0.95
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp 2.6

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE,
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
		653.0									
31	0 1120	655.4	2.0	1.42	1.42	200	87	78	1	140	
38	3 1123	658.0	3.0	2.1	2.1	195	91	78		145	
35	6 1126	661.0	3.0	2.1	2.1						
40	9 1129	663.9	3.0	2.1	2.1	220	101	92	3.5	190	
41	12 1132	667.8	3.0	2.1	2.1	220	105	95	3.5	210	174
17	15 1135	STOP	2.5	1.73	1.73						
19	18; 10 sec 1135	moving cart									
		670.8			Direct reading Changed	potentiometer reading Right 40 Mv, 11 volt potentiometer					
48	1226	670.5	2.5	1.73	1.73	3.3	177	10 77	92 73	3.5	378		
43	1229	673.1	2.5	1.73	1.73	3.2		10 77	95 73	3.5	4		58
45	1232	676.8	2.5	1.73	1.73	3.2		1.0 77	0.9 73		4		
41	1235	679.9	2.0	1.47	1.47	3.2	173	1.1 82	0.9 73		215		64
42	1238	680.0	2.5	1.73	1.73	3.2		1.0 77	92 73	3.5	4		
40	1241	684.8	2.1	1.47	1.47	3.2		1.0 77	73				
	1244	STOP									
		688.6									
25	0 1245	689.0	4.0	2.8	2.8	2.81		1.1 87	.9 73	8	41		
32	3 1248	692.4	4.0	2.8	2.8	2.8	175	1.1 86	.9 73		3.8		62
29	6 1251	696.6	5.0	3.5	3.5	2.8		1.3 90	.9 73	10	3.8		
28	9 1254	699.4	5.0	3.5	3.5	2.9		1.3 90	.9 73		3.8		63
27	12 1257	649.3	4.7	3.1	3.1	2.9	160	1.3 90	.85 73	8	3.8		
30	15 1300	701.4	3.5	2.4	2.4	3.0	165	73					65

COMMENTS: Dial thermometer on stack gas - 175F
gas 175
flue

EPA (Dun) 235
1.72

Inlet Dial
140
146
149
143
Dial CR 140-150

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
					DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
			701.4									
31	18	1305	704.1	3.5	2.4	2.4	3.0			6		
32	21	1308	706.5	3.0	2.0	2.0	2.1	1.2 90	95 73		3.65	
33	24	1311	709.0	2.5	1.7	1.7	3.0	90	73	4		
34	27	1314	711.7	1.75	1.2	1.2	3.3	90	73		3.6 ~~198~~ 194	
35	30	1317	712.7	1.5	1.05	1.05	3.15 180	1.2 86	1.0 77		3.7	
36	33	1320	714.5	1.5	1.05	1.05	3.2	86	77		3.7 198	65
	36	1323	STOP									
	-		Leak check	Probe end crushed + leak in vacuum hose								
			719.7									
13	0	1554	722.5	1.5	1.1	1.1	3.9 204	90	77	1		
14	7	1557	724.1	1.5	1.1	1.1	3.9	90	77			
15	6	1557		1.5	1.1	1.1	3.6	90	77			
16	9	1600		1.5	1.1	1.1	3.6	1.0 150	1.0 77	4	3.0	53
17	12	1603	730.0	2.0	1.5	1.5	3.9	90	77			
18	15	1606	732.3	2.5	1.9	1.9	4.0	1.1 95	1.0 77	5	3.1	
19	18	1609	735.0	3.5	2.5	2.5	3.8					
20	21	1612	741.5	3.5	2.5	2.5	3.8	1.1 87	0.9 77		3.3	55
21	24	1615		5.0	3.5	3.5	3.85 193	1.1 87	0.9 77	13	3.4	
22	27	1618	744.3	5.0	3.5	3.5	3.7	1.1 87	0.9 77		3.4 178	
23	30	1621	~~746.8~~	5.0	3.5	3.5	3.6	1.1 87	0.9 77		3.35	
24	33	1624	750.8	4.5	3.2	3.2	3.7	1.1 87	0.9 77		3.4 178	
	36	1627	STOP									
		~~1644~~										
			752.6									
1		1634	755.2	5.0	3.5	3.5	3.3 178	1.0 77	0.9 73	7	3.6	56
2		1637	757.9	4.5	3.2	3.2	3.4	1.0 77	0.9 73		3.4 184	
3		1640		4.5	3.2	3.2	3.3	1.0 77	0.8 71	8	3.5	
4		1643	761.1	4.5	3.2	3.2	3.4	1.0 77	0.9 73		3.5	
5		1646	768.4	4.5	3.2	3.2	3.4	1.0 77	0.9 77	9	3.8	
6		1649	770.1	3.5	2.5	2.5	3.4	1.0 77	0.9 73		3.9 194	61
7		1652		3.5	2.5	2.5	3.45 18V	1.1 82	0.9 73	8	3.9 200	64
8		1655	776.3	3.5	2.0	2.00	3.5	1.0 77	0.9 73	5	4.1	
9		1658	778.7	2.5	1.8	1.8	3.3					
10		1701	780.4	2.25	1.65	1.65	3.3	1.0 77	0.9 73	4	4.2	
11		1704	783.8	2.25	1.65	1.65	3.3	1.0 77	0.9 73	4	4.2	
12		1707	~~784.8~~	2.10	1.45	1.45	3.15	1.0 82	0.9 73		4.22	
		1710	787.8									

EPA (Dun) 236
4-72

Actual thermometer was 2 hours ahead (was 19°F) Leak check OK (1.8) Ventori not working

(T=144) Vm = 126.6 ft³ at sample point 701.4 to 787.8 = 86.4 ft³

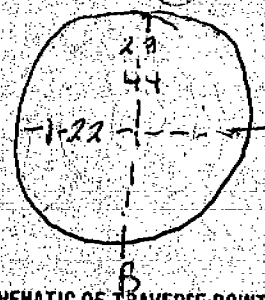
Dial 144 143 154 152

C-17

Sampling Data - Outlet

FIELD DATA

PLANT Westmoreland Coal
DATE 6-18-95
SAMPLING LOCATION outlet
SAMPLE TYPE Particulate
RUN NUMBER 1
OPERATOR Fred, Dave, K Turner
AMBIENT TEMPERATURE 80
BAROMETRIC PRESSURE 27.59
STATIC PRESSURE, (P_s) -1.0
FILTER NUMBER (s)



SCHEMATIC OF TRAVERSE POINT LAYOUT

PROBE LENGTH AND TYPE 8' glass
NOZZLE I.D. 0.196
ASSUMED MOISTURE, % 12
SAMPLE BOX NUMBER 1
METER BOX NUMBER 1
METER $\Delta H_@$ 1.83
C FACTOR 0.98
PROBE HEATER SETTING 250
HEATER BOX SETTING 250
REFERENCE Δp ~~1.62~~ 1.75

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	Probe Temp °F
	6:12	170.662		DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F				
A 1	6:15		2.0	2.1	2.1	112	90	84	6.0	305	58	180
2	6:18		2.0	2.1	2.1	115	90	85	6.0	30.5	60	180
3	6:21		1.8	1.9	1.9	112	88	85	6.0	305	60	156
4	6:24		1.8	1.9	1.9	110	80	80	6.0	305	60	160
5	6:27		1.9	2.0	2.0	115	89	90	6.5	295	80	157
6	6:30		2.0	2.1	2.1	115	90	88	6.5	290	80	155
7	6:33	186.7	2.0	2.1	2.1	110	90	88	7.0	295	80	150
8	6:36		2.0	2.1	2.1	115	90	85	7.0	305	80	155
9	6:39		2.0	2.1	2.1	114	90	90	7.0	320	94	155
10	6:42		2.1	2.2	2.2	115	90	90	7.0	325	80	155
11	6:45		2.1	2.2	2.2	115	90	90	7.0	330	80	155
12	6:48		2.2	2.3	2.3	110	90	85	7.5	325	90	155
13	6:51		2.3	2.4	2.4	110	90	85	8.0	330	84	150
14	6:54	~~212.105~~	2.3	2.4	2.4	110	90	85	8.0	335	75	150
STOP 15	6:57 ~~7:05~~	212.105	2.1	2.2	2.2	105	90	88	8.5	335	82	155
16	7:05 ~~7:08~~	START	2.2	2.3	2.3	110	90	88	8.5	335	75	150
17	7:08 ~~7:11~~		2.1	2.2	2.2	115	85	85	8.5	330	75	205
18	7:11 ~~7:14~~		1.9	2.0	2.0	115	85	85	8.5	320	75	205
19	7:14 ~~7:20~~		1.9	2.0	2.0	115	85	85	8.5	310	82	205
20	7:17 ~~7:23~~		1.9	2.0	2.0	120	85	85	9.0	300	88	205
21	7:20 ~~7:23~~		1.5	1.55	1.55	125	95	90	9.0	280	72	205
22	7:23	230.310	1.6	1.6	1.6	125	95	90	9.0	280	91	205

C-18

COMMENTS:

59,648 ÷ $\sqrt{\Delta P \times (T_s \times 460)}$ = 33,68

115

EPA (Dun) 235

6-18-75

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr. CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	Probe Temp °F
	8:57	230.411										
B 23	8:00		2.1	2.2	2.2	115	75	75	10.0	315	51	185
24	9:03		1.1	1.18	1.18	112	75	75	7.5	310	55	170
25	9:06		1.1	1.18	1.18	111	75	75	7.5	310	55	160
26	9:09		1.0	1.08	1.08	105	75	75	7.5	315	62	150
27	9:12		1.1	1.18	1.18	105	75	75	7.5	300	60	150
28	9:15		1.2	1.28	1.28	105	75	75	8.0	295	65	150
29	9:18		1.2	1.28	1.28	105	75	75	8.0	295	70	155
30	9:21		1.1	1.18	1.18	115	75	75	8.0	290	70	155
31	9:24		1.1	1.18	1.18	115	75	75	8.0	290	70	155
32	9:27		1.2	1.28	1.28	105	75	75	8.0	285	70	155
33	9:30		1.2	1.28	1.28	105	75	75	8.0	270	70	155
34	9:33		1.3	1.4	1.4	110	75	75	9.0	275	70	150
35	9:36		1.6	1.75	1.75	110	75	75	10.0	270	70	150
36	9:39		1.7	1.75	1.75	110	75	75	10.0	270	70	150
37	9:42		1.8	1.85	1.85	115	75	75	10.5	275	70	150
38	9:45		1.8	1.85	1.85	115	75	75	10.5	275	70	155
39	9:48		1.8	1.85	1.85	115	80	75	10.5	270	70	155
40	9:51		2.0	2.1	2.1	115	80	75	11.0	270	70	155
41	9:54		2.0	2.1	1.9	115	80	75	11.0	270	70	160
42	9:57		2.0	2.1	1.9	115	80	75	11.0	270	70	160
43	10:00		2.0	2.1	1.9	110	80	80	11.0	270	70	160
44	10:03	280.311	2.0	2.1	1.9	115	80	80	11.0	270	70	165
		49.90										

$\sqrt{\Delta p_s \times (T_s + 460)} = 29.205$

82.7

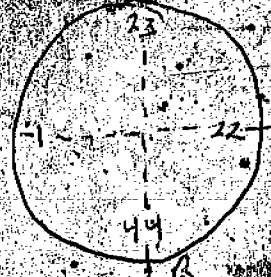
$V_m = 109.548$

C-19

EPA (Dur) 236
4/72

FIELD DATA

PLANT: Kentucky Tobacco Coal
DATE: 6-24-25
SAMPLING LOCATION: Outlet
SAMPLE TYPE: Particulate
RUN NUMBER: 2
OPERATOR: F. Rice, B. Tanner
AMBIENT TEMPERATURE: 90°F
BAROMETRIC PRESSURE: 27.67
STATIC PRESSURE, (P_s): -1.0
FILTER NUMBER (s):



SCHEMATIC OF TRAVERSE POINT LAYOUT

PROBE LENGTH AND TYPE: 8 ft glass
NOZZLE I.D.: 0.182
ASSUMED MOISTURE, %: 12
SAMPLE BOX NUMBER: 4
METER BOX NUMBER: 1
METER ΔH@: 1.85
C FACTOR: 0.99
PROBE HEATER SETTING: 250
HEATER BOX SETTING: 250
REFERENCE Δp: 1.75

44 points
3 min ea
132 min
total time

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	P_s = -1.0
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F				
	3	281.218										
A X		281.310				Changed Filters						
2	1											
2 X		281.375				Changed check valve on leak						
2 X	Start 1pm	281.684										
1 B X	14:48 14:51	282.600	2.0	2.1	2.1	110	80	80	5.0	340	55	140
2 X	14:54		1.9	2.0	2.0	110	80	80	5.0	350	55	135
3 X	14:57	283.7	2.0	2.1	2.1	105	80	80	5.5	370	60	135
4 X	15:00	290.4	1.9	2.0	2.0	105	80	80	5.5	390	60	145
5 X	15:03	293.1	1.9	2.0	2.0	105	85	85	6.0	390	65	145
6 X	15:06	295.8	1.9	2.0	2.0	110	85	80	6.0	345	66	150
7 X	15:09	298.5	1.9	2.0	2.0	108	85	80	6.5	350	66	150
8 X	12	301.2	2.0	2.1	2.1	105	85	80	7.0	345	66	150
9 X	15	304.0	2.1	2.2	2.2	110	85	80	7.5	304	66	155
10 X	18	306.7	2.1	2.2	2.2	110	85	80	8.0	325	67	150
11 X	21	309.5	2.2	2.3	2.3	108	85	80	8.5	350	70	150
12 X	24	312.4	2.3	2.4	2.4	110	85	80	8.5	350	72	150
13 X	27	315.4	2.4	2.48	2.48	110	90	85	8.5	338	72	145
14 X	30	318.5	2.4	2.48	2.48	110	90	85	8.5	330	70	150
15 X	33	321.4	2.4	2.48	2.48	110	92	85	8.5	330	70	150
16 X	36		2.2	2.3	2.3	110	90	86	8.0	335	70	160
17 X	39		2.1	2.2	2.2	110	90	80	8.0	330	75	160
18 X	42	327.1	2.0	2.1	2.1	108	90	85	8.0	330	75	165
19 X	45	335.6	2.0	2.1	2.1	107	90	85	7.5	310	74	165
	48		1.9	1.75	1.75	105	90	85	7.0	328	70	165
	51		1.8	1.8	1.8	110	90	85	6.0	325	76	170
	54	340.0	1.8	1.8	1.8	108	90	86	6.0	325	76	170

COMMENTS: 2.0 2.1 (6.4) 2.2

EPA (Rev) 235

C-20

Run #1

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	Probe Temp °F
	3	16:14	343.310										
B 23		16:17	345.9	2.4	2.48	2.48	105	85	80	6.5	345	85	100
24		16:20		0.68	0.74	0.74	105	85	80	2.0	350	67	100
25		16:23		0.65	0.7	0.7	105	90	85	2.0	360	68	105
26		16:26		0.67	0.68	0.68	105	90	85	2.0	355	68	105
27		16:29	351.2	0.65	0.7	0.7	105	90	85	2.0	350	66	105
28		16:32	352.8	0.75	0.85	0.85	110	90	85	2.5	355	65	100
29		16:35	356.1	0.75	0.8	0.8	105	88	85	2.5	355	66	100
30		16:38	357.6	0.68	0.74	0.74	103	85	80	2.5	350	66	110
31		16:41		0.68	0.79	0.79	103	85	80	2.8	358	65	105
32		16:44	360.7	0.65	0.7	0.7	103	88	82	2.8	365	68	105
33		16:47		0.65	0.7	0.7	102	90	85	2.8	378	65	[illegible]
34		16:50		2.0	2.1	2.1	105	85	80	7.0	363	66	[illegible]
35		16:53	366.4	2.0	2.1	2.1	110	85	80	7.0	370	66	[illegible]
36		16:56		2.0	2.1	2.1	105	90	85	7.0	380	67	[illegible]
37		16:59		1.9	2.0	2.0	108	90	85	6.5	375	67	[illegible]
38		17:02	369.1	1.9	2.0	2.0	107	91	85	6.5	375	70	85
39		17:05		1.7	1.78	1.78	100	90	80	6.0	360	71	85
40		17:08		1.6	1.7	1.7	101	90	85	6.0	385	72	85
41		17:11	380.681	1.7	1.78	1.78	100	90	86	6.0	383	68	80
42		~~17:14~~ 17:30	382.4	1.0	1.07	1.07	105	85	80	4.5	400	65	85
43		~~17:17~~ 17:33		1.1	1.17	1.17	105	85	80	4.5	400	64	85
44		~~17:20~~ 17:36		1.1	1.17	1.17	105	85	80	4.5	400	65	[illegible]

restart at 17:27

41.83 / 44 = 1.186

1.74 / 84 = 82.9

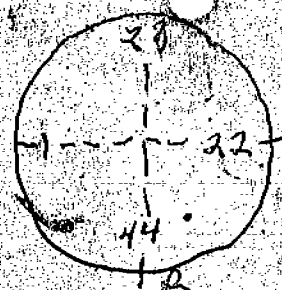
H_2O
66
48
28

T = 132

39.1
61.4
V_m = 100.5

FIELD DATA

PLANT Westmoreland Coal
DATE 6-20-95
SAMPLING LOCATION Outlet
SAMPLE TYPE Particulate
RUN NUMBER 3
OPERATOR Elias K Tanner
AMBIENT TEMPERATURE 65
BAROMETRIC PRESSURE 27.57
STATIC PRESSURE, (P_s) -1.0
FILTER NUMBER (s)



SCHEMATIC OF TRAVERSE POINT LAYOUT

PROBE LENGTH AND TYPE 8' glass
NOZZLE I.D. 0.182
ASSUMED MOISTURE, % 12
SAMPLE BOX NUMBER 1
METER BOX NUMBER 1
METER $\Delta H_@$ 1.853
C FACTOR 0.991
PROBE HEATER SETTING Max.
HEATER BOX SETTING 350
REFERENCE Δp 1.75

READ AND RECORD ALL DATA EVERY 3 MINUTES

C-22

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PUMP TEMP °F
					DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F				
		7:40	386.753										
A 1		43		1.7	1.8	1.8	105	70	70	5.0	350	52	205
2		46	390.9	1.8	1.9	1.9	115	71	70	5.5	352	55	195
3		49	393.2	1.9	2.0	2.0	106	25	70	6.0	340	55	184
4		52	395.7	1.9	2.0	2.0	105	70	70	6.5	325	52	180
5		55	398.1	1.9	2.0	2.0	108	70	65	6.5	325	52	178
6		58	400.5	1.9	2.0	2.0	105	70	65	6.5	330	54	178
7		10:01	402.9	1.9	2.0	2.0	108	70	65	7.0	335	55	170
8	Start	04	404.948	1.9	2.0	2.0	105	75	65	7.0	333	55	170
9	11:20	11:03 OT	407.3	1.9	2.0	2.0	110	73	68	7.5	370	60	220
10		11:06 06	409.6	1.9	2.0	2.0	110	73	70	7.5	365	60	180
11		09 08	412.1	2.0	2.1	2.1	115	78	75	8.0	365	65	175
12		12 11	414.8	2.2	2.3	2.3	110	78	73	9.0	350	58	170
13		15 14	417.5	2.3	2.4	2.4	118	77	73	9.5	340	58	173
14		18 17	420.2	2.3	2.4	2.4	112	76	73	10.0	337	60	178
15		21 20	422.8	2.3	2.4	2.4	110	77	72	10.0	343	60	185
16		24 23	425.4	2.2	2.3	2.3	108	77	73	10.5	341	64	188
17		27 26		2.1	2.2	2.2	110	78	73	10.0	343	62	190
18		30 29		2.0	2.1	2.1	108	78	74	10.0	345	65	195
19		33 32		1.9	2.0	2.0	110	78	73	10.0	345	65	195
20		36 35		1.8	1.9	1.9	108	80	75	10.0	345	65	193
21		39 38		1.5	1.5	1.5	105	85	78	9.5	345	65	195
22		42 41	439.938	1.4	1.48	1.48	108	85	80	9.0	345	66	185

COMMENTS:

53.145

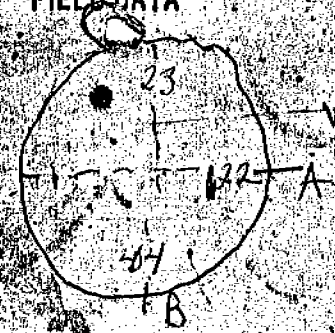
TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m) (ft³)	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE °F
					DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
			439.985									
23		08	442.5	2.2	2.3	2.3	118	70	67	6.5	305	50
24		11	445.1	2.3	2.4	2.4	103	70	65	7.0	307	51
25		14		2.4	2.48	2.48	103	70	[illegible]	7.5	315	50
26		17		2.3	2.4	2.4	107	75	68	7.5	320	53
27		20		2.3	2.4	2.4	108	75	70	8.0	325	53
28		23		2.2	2.3	2.3	110	75	69	8.0	330	55
29		26		2.2	2.3	2.3	110	75	70	8.0	330	55
30		29	461.1	2.2	2.3	2.3	115	75	70	8.5	335	60
31		32	463.7	2.1	2.2	2.2	112	78	73	9.0	340	60
32		35	466.3	2.1	2.12	2.2	115	78	72	9.5	340	60
33		38	468.8	2.0	2.1	2.1	115	80	73	10.0	340	60
34		41		2.1	2.2	2.2	112	80	73	10.5	350	60
35		44		2.0	2.1	2.1	114	80	73	10.0	350	60
36	Start	47	476.552	2.0	2.1	2.1	105	80	75	10.0	330	60
37	15:04	07		1.8	1.9	1.9	110	75	70	9.5	305	60
38		10	481.3	1.6	1.7	1.7	112	75	70	9.5	305	60
39		13		1.5	1.5	1.5	113	75	70	9.5	315	60
40		16		1.4	1.48	1.48	112	75	70	9.5	325	60
41		19		1.2	1.27	1.27	112	78	72	8.5	330	62
42		22	489.8	1.1	1.16	1.16	108	77	75	8.0	330	62
43		25		1.1	1.16	1.16	110	80	76	8.0	328	64
44		28	493.437	0.8	0.86	0.86	110	80	76	7.0	325	65
						4	81.59 =					
			53.542									
			53.185			1.99						
			106.727									

EPA (Dur) 236
4/72

6-23

FIELD DATA

PLANT Westmoreland Coal
DATE 6-23-80
SAMPLING LOCATION Outlet
SAMPLE TYPE Particulate
RUN NUMBER 4
OPERATOR Fl. Rice, K. Turner
AMBIENT TEMPERATURE 80
BAROMETRIC PRESSURE 27.68
STATIC PRESSURE, (P_s) 1.0
FILTER NUMBER (s) 4a & 4b



PROBE LENGTH AND TYPE 8' glass
NOZZLE I.D. 0.156
ASSUMED MOISTURE, % 12
SAMPLE BOX NUMBER 4
METER BOX NUMBER 1
METER $\Delta H_@$ 1.83
C FACTOR 0.91
PROBE HEATER SETTING Max.
HEATER BOX SETTING 250
REFERENCE Δp 1.75

C-24

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	[illegible]
		493.640										
A 1	15:52	496.3	1.6	1.7	1.7	115	80	75	1.5	380	50	[illegible]
2	55	498.6	1.8	1.9	1.9	115	80	80	1.5	360	50	[illegible]
3	58	501.1	1.8	1.9	1.9	118	85	80	1.5	295	52	[illegible]
4	16:01	503.5	1.8	1.9	1.9	115	85	80	1.5	350	52	[illegible]
5	04	505.8	1.8	1.9	1.9	115	85	80	1.5	375	54	[illegible]
6	07	508.3	1.7	1.8	1.8	115	85	80	1.5	335	54	185
7	10	510.6	1.7	1.8	1.8	118	85	80	2.0	335	55	180
8	13	513.0	1.8	1.9	1.9	117	85	80	2.0	325	55	185
9	16		1.9	2.0	2.0	120	85	80	2.0	330	55	175
10	19	518.0	1.9	2.0	2.0	120	85	80	2.5	325	55	180
11	22	520.5	2.0	2.1	2.1	118	85	80	3.0	340	57	180
12	25		2.2	2.28	2.28	120	85	80	3.5	345	56	180
13	28		2.3	2.37	2.37	119	85	80	4.5	350	56	180
14	31		2.3	2.37	2.37	120	85	80	4.5	380	57	180
15	34	531.2	2.3	2.37	2.37	120	85	80	5.0	375	57	190
16	37		2.2	2.28	2.28	115	85	80	5.0	365	57	200
17	40		2.1	2.2	2.2	118	85	80	5.0	368	58	200
18	43		2.1	2.2	2.2	110	85	80	5.0	350	57	200
19	46		2.0	2.1	2.1	110	85	80	5.0	355	57	200
20	49		1.8	1.9	1.9	115	85	80	5.0	360	57	[illegible]
21	52		1.6	1.7	1.7	115	85	80	5.0	365	60	210
22	55	548.976	1.5	1.58	1.58	112	85	80	5.0	365	60	210
	16:58											

COMMENTS:

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGE TEMPERATURE, °F	Probe Temp °F
			5 ~~4~~49.442										
B 23	18:11		551.6	2.1	2.2	2.2	115	85	80	2.0	400	[illegible]	205
24	14			2.1	2.2	2.2	115	85	80	2.0	390	[illegible]	200
25	17			2.3	2.37	2.37	115	85	80	2.5	390	50	[illegible]
26	20		559.4	2.2	2.28	2.28	115	85	80	3.0	380	50	170
27	23		562.1	2.3	2.37	2.37	118	85	80	3.5	380	57	170
28	26		564.7	2.3	2.37	2.37	115	85	80	3.5	390	58	175
29	29			2.3	2.37	2.37	115	85	80	4.0	390	58	170
30	32		570.0	2.2	2.28	2.28	115	85	80	4.0	390	58	[illegible]
31	35			2.2	2.28	2.28	115	85	80	4.0	390	58	175
32	38		575.2	2.1	2.2	2.2	115	85	80	4.0	390	60	175
33	41			2.1	2.2	2.2	117	85	80	4.5	385	60	180
34	44			2.1	2.2	2.2	120	88	80	4.5	385	60	175
35	47			2.1	2.2	2.2	118	88	80	5.0	380	60	180
36	50			2.0	2.1	2.1	115	85	80	5.0	380	62	190
37	53			1.9	2.0	2.0	115	85	80	5.0	380	62	195
38	56			1.6	1.7	1.7	120	88	82	5.0	385	64	205
39	59			1.5	1.58	1.58	120	88	82	4.5	385	64	[illegible]
40	19:02			1.3	1.4	1.4	120	80	85	4.5	385	68	[illegible]
41	05			1.2	1.28	1.28	118	88	82	4.5	385	68	[illegible]
42	08			1.2	1.28	1.28	115	88	82	4.5	385	68	[illegible]
43	11			0.98	1.06	[illegible]	115	88	82	4.0	385	68	220
44	14		603.314	0.95	1.03	1.03	115	88	82	4.0	385	70	220
	19:17												

T = 132 V = 109.21

87.3 / 44 = ~~2.0~~ 1.98

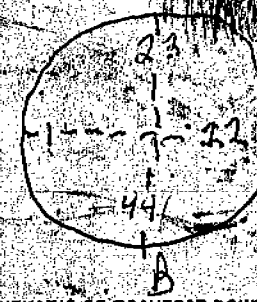
T_m = 82.5

C-25

EPA (Dur) 236
4/72

FIELD DATA

PLANT Westmoreland Coal
DATE 6-25-75
SAMPLING LOCATION Outlet
SAMPLE TYPE Particulate
RUN NUMBER 5
OPERATOR F.L. Rice K. Turner
AMBIENT TEMPERATURE 80
BAROMETRIC PRESSURE ~~27.67~~ 27.61
STATIC PRESSURE, (P_s) 1.0 H_2O
FILTER NUMBER (s)



PROBE LENGTH AND TYPE 8' glass
NOZZLE I.D. 0.186
ASSUMED MOISTURE, % 12
SAMPLE BOX NUMBER 1
METER BOX NUMBER 1
METER $\Delta H_@$ 1.33
C FACTOR 0.91
PROBE HEATER SETTING Max.
HEATER BOX SETTING 350
REFERENCE Δp 1.75

1276
1225
51
15
66

4/4 points
22/port
3 min/point
132 min
total run

C-26

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	[illegible]
		604.580										
A. 1	11:17		1.6	1.7	1.70	120	85	80	7.0	330	50	185
2	20	608.9	1.8	1.9	1.9	120	85	80	7.5	330	50	185
3	(15) 23	611.2	1.7	1.79	1.79	115	85	80	7.5	330	52	170
4	End 26	613.6	1.7	1.79	1.79	112	85	80	8.0	330	54	167
5	11:32 ← 29	616.0	1.8	1.9	1.9	108	85	80	8.0	330	60	165
6	Start 12:25 ~~32~~	618.4	1.7	1.79	1.79	110	85	80	8.0	335	54	185
7	28 ~~35~~	620.8	1.7	1.79	1.79	110	85	82	8.0	340	52	180
8	31	623.2	1.8	1.9	1.9	110	88	85	8.5	335	54	160
9	34		1.8	1.9	1.9	110	85	85	9.0	335	58	155
10	37	628.1	1.9	2.0	2.0	110	85	85	9.5	340	60	145
11	40		2.0	2.1	2.1	110	85	82	10.0	340	66	145
12	43		2.1	2.2	2.2	112	85	82	10.5	330	65	160
13	46		2.2	2.28	2.28	112	85	82	11.0	335	65	160
14	49		2.2	2.28	2.28	112	88	84	11.0	340	65	165
15	52		2.2	2.28	2.28	110	87	82	11.0	335	66	175
16	55		2.2	2.28	2.28	110	88	82	11.0	340	65	175
17	58		2.1	2.2	2.2	112	88	82	11.0	335	65	180
18	13:01		2.0	2.1	2.1	110	88	82	11.0	335	65	185
19	04		1.9	2.0	2.0	113	88	82	11.0	335	67	190
20	07		1.8	1.9	1.9	110	90	85	11.0	330	67	185
21	10		1.6	1.67	1.67	110	90	83	11.0	335	68	185
22	13	658.535	1.6	1.67	1.67	111	90	85	11.0	330	68	185
	13:16											

COMMENTS:

53.96 ft³

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	Probe Temp °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F				
B-23	15:51	658.635	1.8	1.9	1.9	115	80	78	7.5	285	58	190
24	54	660.7	1.9	2.0	2.0	120	80	79	8.0	270	58	180
25	57	663.2	1.7	2.0	2.0	120	80	78	8.0	270	59	175
26	16:00	668.3	2.2	2.1	2.1	117	80	78	8.5	265	65	175
27	03	670.7	2.10	2.1	2.1	115	80	78	9.0	260	65	175
28	06		1.4	2.0	2.0	120	80	78	9.5	255	65	175
29	09	675.8	2.0	2.1	2.1	120	80	78	9.5	255	60	170
30	12	678.3	2.0	2.1	2.1	115	84	81	9.5	250	58	170
31	15	680.8	2.0	2.1	2.0	115	83	82	9.5	240	58	165
32	18	683.4	2.0	2.1	2.1	115	82	79	9.5	238	70	163
33	21		2.0	2.1	2.1	115	82	79	9.5	235	65	155
34	24		1.9	2.0	2.0	117	86	80	9.5	230	66	153
35	27		1.9	2.0	2.0	117	84	78	9.5	235	62	153
36	30		1.8	1.9	1.9	115	85	78	9.5	235	65	170
37	33		1.5	1.58	1.58	115	85	77	9.0	235	65	178
38	36		1.5	1.58	1.58	117	87	80	9.0	230	68	180
39	39		1.3	1.39	1.39	113	87	80	8.0	225	68	185
40	42		1.3	1.38	1.38	112	85	80	8.0	225	68	188
41	45		1.2	1.25	1.25	115	86	80	7.5	225	68	190
42	48		1.1	1.15	1.15	117	85	80	7.5	220	68	190
43	51		0.99	1.05	1.05	117	85	80	7.0	210	68	185
44	54	708.643	1.05	1.1	1.1	120	85	80	7.0	222	68	175
	1659						85	80	7.0	225	70	185

$\Delta H_{avg} = 1.11$ $\quad 81.4$

$\Delta p_{avg} = 1.78$ $\quad 44$

$C_p = 0.84$ $\quad 1.87$

$\sqrt{\Delta p}$

$T_s = 132$

$V_m = 10$ $\quad 50.000\ ft^3 - 53.96\ ft^3 = 3.96\ ft^3$

$\frac{(T_s)(460)}{(P_s)(M_d)}$

$\sqrt{\Delta p_{avg}}$

$T_m = 99.5$

$7893 = 83$

80

C-27

EPA (Dur) 236
4/72

Molecular Weight Calculations

Gas Analysis Data - Outlet

C-29

DRY MOLECULAR WEIGHT DETERMINATION

PLANT Westmoreland Coal Co

DATE 6/18/75

SAMPLING TIME (24-hr CLOCK) 18:12 to 19:45

SAMPLING LOCATION Out stack.

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) Int Bag

ANALYTICAL METHOD Orsat

AMBIENT TEMPERATURE ca. 70°F

OPERATOR D. McAlevy

COMMENTS:

GAS \ RUN	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	1.7%	—	1.7%	—	1.7%	—	1.7%	44/100	0.748
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	20.8	19.1%	20.8	19.1%	20.8	19.1%	19.1	32/100	6.11
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)		<1%		<1%		<1%	<1	28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		79.3		79.3		79.3	79.3	28/100	22.20
								TOTAL	29.1

EPA (Dur) 230
4/72

DRY MOLECULAR WEIGHT DETERMINATION

PLANT Westmoreland Quinwood

DATE 6/19/75

SAMPLING TIME (24-hr CLOCK) 15:40 to 16:14

SAMPLING LOCATION

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) Bag. Integrated

ANALYTICAL METHOD Orsat

AMBIENT TEMPERATURE

OPERATOR J.S. McNulty

COMMENTS:

RUN / GAS	1 ACTUAL READING	1 NET	2 ACTUAL READING	2 NET	3 ACTUAL READING	3 NET	AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
CO_2		0.9		0.9		1.0	0.93	44/100	0.41
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)		20.0		19.5		19.8	19.77	32/100	6.32
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)		0.05		0.0		0.0	0.02	28/100	0.06
N_2 (NET IS 100 MINUS ACTUAL CO READING)							26.72 / 79.28	28/100	22.20
								TOTAL	28.99

EPA (Dur) 230
4/72

DRY MOLECULAR WEIGHT DETERMINATION

PLANT Kentucky Coal Supreme / Smokeless Div.
DATE 6/20/75
SAMPLING TIME (24-hr CLOCK) 12:05 – 12:35
SAMPLING LOCATION Prep Plant Stack
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS)
ANALYTICAL METHOD Orsat (see also Fyrite)
AMBIENT TEMPERATURE
OPERATOR McNeely

COMMENTS:

GAS \ RUN	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2		1.0%		0.9%		1.1%	1.0	44/100	0.44
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)		20.0%		19.9%		20.0%	20.0	32/100	6.4
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)		Nil		Nil		Nil	Nil	28/100	0.0
N_2 (NET IS 100 MINUS ACTUAL CO READING)							79.0	28/100	22.0
								TOTAL	28.8

EPA (Dur) 230
4/72

DRY MOLECULAR WEIGHT DETERMINATION

PLANT Imperial / Saddleless Division, Westmoreland Coal Co. COMMENTS:
DATE 6/23/75 Concident with Run # QNC-4
SAMPLING TIME (24-hr CLOCK) 1610 – 1713
SAMPLING LOCATION
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) Integrate from 2 outlet ports
ANALYTICAL METHOD
AMBIENT TEMPERATURE
OPERATOR Rice / McNulty

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2		0.7		0.8		0.9	0.8	44/100	0.35
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)		20.1		20.2		19.8	20.0	32/100	6.40
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)		Nil		Nil		Nil	Nil	28/100	0.00
N_2 (NET IS 100 MINUS ACTUAL CO READING)							79.2	28/100	22.18
								TOTAL	28.93

EPA (Dur) 230
4/72

C-32

DRY MOLECULAR WEIGHT DETERMINATION

PLANT Westmoreland Imperial Smokeless Div.
DATE 6/25/75
SAMPLING TIME (24-hr CLOCK) 11:30, 12:40, 13:34
SAMPLING LOCATION Outlet Stack
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS)
ANALYTICAL METHOD Orsat
AMBIENT TEMPERATURE
OPERATOR McNulty

COMMENTS:

RUN / GAS	1 11:30		2 12:40		3 13:34		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2		1.0		0.7		1.0	0.9	44/100	0.40
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)		19.4		19.9		19.7	19.7	32/100	6.30
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)		Nil		Nil		Nil	Nil	28/100	0.00
N_2 (NET IS 100 MINUS ACTUAL CO READING)							79.4	28/100	22.23
								TOTAL	28.93

EPA (Dur) 230
4/72

C-33

Field Analytical Data

Analytical Data - Inlet

ANALYTICAL DATA

PLANT WEST MORELAND COAL CO.

DATE JUNE 18, 1975 - WEDNESDAY

SAMPLING LOCATION DUNWOODY, W. Va

SAMPLE TYPE PARTICLE Determination

RUN NUMBER THIMBLE -1

SAMPLE BOX NUMBER FIVE GLASS SET #5

CLEAN-UP MAN BILL

COMMENTS:

Took flow at the plenum at the beginning for probe stratification to see if it met specific velocities, (changes in density full day) the set was not used.

FRONT HALF

7/3/75 FILTER LOADED INDICATING THAT THIMBLED LEAKED.

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

LABORATORY RESULTS

CONTAINER _____ _____ mg

CONTAINER _____ _____ mg

FILTER NUMBER 0.4452 _____

tare 0.3776 g _____

net 67.6 _____

THIMBLE WC-1

tare 102.4000 g

120.4387 Ashed

17.9

18.6.7 Flowby

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

ETHER-CHLOROFORM EXTRACTION _____ mg

CONTAINER _____ _____ mg

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

Rinse volumes _____ ml _____ ml _____ ml _____ ml _____ ml _____

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	322 ml	113 ml	8 ml	_____ ml	_____ ml	_____
INITIAL VOLUME	100 ml	100	0	_____	_____	_____
NET VOLUME	222 ml	13 ml	8 ml	_____ ml	_____ ml	_____ ml

SILICA GEL			
FINAL WEIGHT	503.2 g	_____ g	_____ g
INITIAL WEIGHT	475.1 g	_____ g	_____ g
NET WEIGHT	28.1 g	_____ g	_____ g

TOTAL MOISTURE 271.3 _____

EPA (Dur) 231
6/72

222
13
8

ANALYTICAL DATA

PLANT WESTMORELAND COAL CO.

DATE JUNE 19, 1975 - THURSDAY

SAMPLING LOCATION QUINWOOD, W. Va.

SAMPLE TYPE PARTICLE SIZE DISTRIBUTION

RUN NUMBER THIMBLE - 2 (INLET.)

SAMPLE BOX NUMBER FIVE - GLASS SET 5

CLEAN-UP MAN BAYOS

COMMENTS:

Sticky RAC fine below limit for Re and wet test, glassware allowed on same.

FRONT HALF

very light gray particle

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — CONTAINER _____ _____ mg

TH-2

FILTER NUMBER 0.3620 g _____

tare 0.3606 g _____

net 1.4 mg

CONTAINER _____ _____ mg

THIMBLE W.C 2. 88.2500 grams

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER _____ _____ mg

ETHER-CHLOROFORM EXTRACTION _____ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER — CONTAINER _____ _____ mg

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

	1	2	3	4	5	6
Rinse volumes	ml	ml	ml	ml	ml	ml

MOISTURE (1st IMPINGER, IN ADVERTENTLY INLET CONNECTED ON OUTLET)

	1	2	3	4	5	6
IMPINGERS						
FINAL VOLUME	110 ml	190 ml	5 ml	ml	ml	
INITIAL VOLUME	100 ml	100	6			
NET VOLUME	10 ml	90 ml	5 ml	ml	ml	ml
SILICA GEL (about 75% spent)						
FINAL WEIGHT	496.9 g	g	g			
INITIAL WEIGHT	475.0 g	g	g			
NET WEIGHT	21.9 g	g	g			

TOTAL MOISTURE 112.9 _____

ANALYTICAL DATA

plant line clean-up
for sample train
& front half

PLANT WEST VIRGINIA COAL CO.

DATE June 19, 1975

SAMPLING LOCATION QUINWOOD, W. Va.

SAMPLE TYPE PARTICULATE SITE

RUN NUMBER THIMBLE-3

SAMPLE BOX NUMBER BWE3 + Pump

CLEAN-UP MAN Baylor

COMMENTS:
6/20/75 Since an unabsorbed fraction was noted, and observed at the outlet of the run, (Traverse started at the wind set of probe original measurements), the run was stopped. The run would not have contained a representative sample of particulate sample.

FRONT HALF

FILTER IS CLEAN, However the two RAC FILTER HOLDER, with EPA GLASS FIBER FILTER FRIT, CUT WHEN IT WAS TAKEN APART

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

FILTER NUMBER 0.3762 ← Save EPA #

tare 0.3750 g

net 1.2

net THIMBLE WC-3 → 86.1785
tare 82.7890
3.3895 g

LABORATORY RESULTS

CONTAINER _____ _____ mg

CONTAINER _____ _____ mg

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

ETHER-CHLOROFORM EXTRACTION _____ mg

CONTAINER _____ _____ mg

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

Rinse volumes _____ ml _____ ml _____ ml _____ ml _____ ml _____

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	_____ ml	_____ ml	_____ ml	0 ml	0 ml	_____
INITIAL VOLUME	100 ml	100	0	_____	_____	_____
NET VOLUME	_____ ml	_____ ml	_____ ml	_____ ml	_____ ml	_____ ml

SILICA GEL			
FINAL WEIGHT	_____ g	_____ g	_____ g
INITIAL WEIGHT	475 g	_____ g	_____ g
NET WEIGHT	_____ g	_____ g	_____ g

TOTAL MOISTURE _____ _____

ANALYTICAL DATA

PLANT WESTMORELAND COAL CO.

DATE JUNE 20, 1975 (FRIDAY)

SAMPLING LOCATION QUINWOOD, W. Va

SAMPLE TYPE TRIABLE, BACKED-UP BY STD EPA METHOD 5 TRAIN

RUN NUMBER TA-4

SAMPLE BOX NUMBER 5, glass set #3

CLEAN-UP MAN Boyton

COMMENTS: ~~Weighed~~ Final weight of silica gel obtained on June 20. The rest of the train was sealed and set aside until 6/23/75, at which time clean up of glassware and recovery of sample occurred.

FRONT HALF

FILTER IS CLEAN, NO SOOT

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

FILTER NUMBER 0.3840

tare 0.3818 g

net 2.2

WC-4 TRIABLE = 75.6395 g
95.3000
15.4

LABORATORY RESULTS

CONTAINER _____ _____ mg

CONTAINER _____ _____ mg

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

ETHER-CHLOROFORM EXTRACTION _____ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

Rinse volumes _____ ml _____ ml _____ ml _____ ml _____ ml _____

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	233 ml	118 ml	4 ml	ml	ml	
INITIAL VOLUME	100 ml	100	0	∝	∝	∝
NET VOLUME	133 ml	18 ml	ml	ml	ml	ml

weighed June 20, 1975

133
18
4
17.6
172.6

SILICA GEL			
FINAL WEIGHT	492.6 g	g	g
INITIAL WEIGHT	475.0 g	g	g
NET WEIGHT	17.6 g	g	g

TOTAL MOISTURE 172.6 _____ g

EPA (Dur) 231
4/72

ANALYTICAL DATA

PLANT WESTMORELAND COAL CO.

DATE JUN 23 1975 MONDAY

SAMPLING LOCATION QUINNIMONT, W. Va

SAMPLE TYPE PARTICLES

RUN NUMBER TH-5 FIVE (THIMBLE) POINT

SAMPLE BOX NUMBER 5, glass set #3

CLEAN-UP MAN Boyd

COMMENTS:

back up filter black with soot, since back pressure was higher than can be pulled by the vacuum pump, it was necessary to replace the filter.

9:55 while cleaning up probe, noticed a hairline crack in the base of the front filter (ceramic) thimble holder

FRONT HALF

Fractional #2 TH-5a installed about 6:45 PM HAS SOOT

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

710 ml

FILTER NUMBER	1.1485	0.3861
tare	0.3705 g	0.3753
net	0.7780	0.0108
	ERROR	115.42
Thimble - WES -	90.7577 gm	
	24.67	

CONTAINER _____ _____ mg

CONTAINER _____ _____ mg

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

ETHER-CHLOROFORM EXTRACTION _____ mg

CONTAINER _____ _____ mg

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

Rinse volumes _____ ml _____ ml _____ ml _____ ml _____ ml _____

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	338 ml	136 ml	8 ml	X ml	X ml	X
INITIAL VOLUME	100 ml	100	0			
NET VOLUME	238 ml	36 ml	8 ml	ml	ml	ml

98% Spent

SILICA GEL			
FINAL WEIGHT	508.5 g	g	g
INITIAL WEIGHT	475.0 g	g	g
NET WEIGHT	33.5 g	g	g

TOTAL MOISTURE 345.5

EPA (Dur) 231
4/72

ANALYTICAL DATA

PLANT WEST MORELAND COAL Co

DATE JUN 24 1975 – JUN 25 1975

SAMPLING LOCATION QUINWOOD W. Va

SAMPLE TYPE PARTICLE SIZE DISTRIBUTION

RUN NUMBER TH-6 (Six) THIMBLE

SAMPLE BOX NUMBER 5, glass rack set #3

CLEAN-UP MAN Baxter

COMMENTS:
Run was scheduled for June 24, 1975; however due to plant operational problems, this run was rescheduled for June 25, 1975
33:14 – Replaced 4th impinger, stem pipe broke during port change; replaced with (top cracked) spare stainless steel tube

FRONT HALF

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

FILTER NUMBER	0.3924	
tare	0.3754 g	0.3542 g
net	0.0170	

90.9770 Post Cleaning Wt
Probe + Cyclone = 2.
We-6 THIMBLE 71.1974 86.9437 g
19.7463
170
19.8133

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

Rinse volumes ml ml ml ml ml

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	314 ml	92 ml	5 ml	ml	ml	
INITIAL VOLUME	100 ml	100	0	X	X	X
NET VOLUME	214 ml	92 ml	5 ml	ml	ml	ml

Has silica gel. ≈ 1-2 grams.

250 64 314

214 92 6 24.2 335.2

≈ 98% spent.

SILICA GEL			
FINAL WEIGHT	499.2 g	g	g
INITIAL WEIGHT	475 g	g	g
NET WEIGHT	24.2 g	g	g

TOTAL MOISTURE 335.2

LABORATORY RESULTS

CONTAINER		mg
CONTAINER		mg
FRONT HALF SUBTOTAL		mg
CONTAINER		mg
ETHER-CHLOROFORM EXTRACTION		mg
CONTAINER		mg
BACK HALF SUBTOTAL		mg
TOTAL WEIGHT		mg

Analytical Data-Outlet

C-41

ANALYTICAL DATA

PLANT WEST MORELAND COAL Co -

DATE JUNE 18, 1975 - WEDNESDAY

SAMPLING LOCATION RUNNYMEDE, West Va.

SAMPLE TYPE PARTICULATE - EPA METHOD 5

RUN NUMBER GWC-1

SAMPLE BOX NUMBER one,

CLEAN-UP MAN Bayles

calculated 0.330"
actual 0.270"

COMMENTS:

2-liter counter for each of filter holder - but not broken -

FRONT HALF

LABORATORY RESULTS

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

CONTAINER _____ _____ mg

	GWC-1	GWC-1
FILTER NUMBER	0.4425	
tare	0.3591 g	
net	83.6 mg	

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

ETHER-CHLOROFORM EXTRACTION _____ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

ACETONE SOURCE BURDICK & JACKSON
DISTILLED IN GLASS; LOT # 7150

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

Rinse volumes	ml	ml	ml	ml	ml	

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	201 ml	193 ml	40 ml	ml	X ml	ml
INITIAL VOLUME	100 ml	100	0			
NET VOLUME	101 ml	93 ml	40 ml	ml	ml	ml

almost spent in 90%

SILICA GEL	519.2
FINAL WEIGHT	519.2 g
INITIAL WEIGHT	475.0 g
NET WEIGHT	44.2 g

TOTAL MOISTURE 285.2 grams

EPA (Dur) 231
4/72

ANALYTICAL DATA

PLANT WESTMORELAND COAL COMPANY

DATE JUNE 19, 1975

SAMPLING LOCATION QUINNIMONT, WEST VIRGINIA

SAMPLE TYPE PARTICULATE, EPA METHOD 5

RUN NUMBER QNC-2

SAMPLE BOX NUMBER 2, Glassware # 2

CLEAN-UP MAN Bowles

COMMENTS: Later probe aborted during run, comp. ratio, was calculated on probe catch separated in the probe catch, volume in filter & catch flask was estimated at 10 ml.

Filter on TEC rec'd with cyclone contents & bottom probe catch was combined & dried in desiccator for 24 hrs. Final weight was estimated as the weight of tare + total contents of cyclone & probe catch

FRONT HALF

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER — FILTER CARRIED AT POST CYCLONE

	QNC-2 (b)	QNC-2 — 1st PART OF RUN
FILTER NUMBER	0.4106	0.4155
tare	0.3693 g	0.3623
net	41.3 mg	53.2

94.5 mg

LABORATORY RESULTS

CONTAINER _____ _____ mg

CONTAINER _____ _____ mg

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

ETHER-CHLOROFORM EXTRACTION _____ mg

CONTAINER _____ _____ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

154 ml − 146 = 8

carbon black inside on impinger & stem pipe

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

Rinse volumes	ml	ml	ml	ml	ml	ml

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	266 ml	146 ml	8 ml	ml	ml	
INITIAL VOLUME	100 ml	100	0			
NET VOLUME	166 ml	46 ml	8 ml	ml	ml	ml

SILICA GEL				
FINAL WEIGHT	503.0 g	g	g	
INITIAL WEIGHT	475.0 g	g	g	
NET WEIGHT	28.0 g	g	g	

TOTAL MOISTURE 248.0

166 + 46 + 8 = 28 / 248

EPA (Dur) 231
4/72

91.184 ft³ STD

ANALYTICAL DATA

PLANT WESTMORELAND, COAL CO

DATE JUNE 20, 1975

SAMPLING LOCATION QUINWOOD, W. Va

SAMPLE TYPE PARTICULATE – METHOD 5

RUN NUMBER QNC-3

SAMPLE BOX NUMBER one - glass set #1

CLEAN-UP MAN Baxter

COMMENTS:
Probe #2 was on the run with the replaced probe #1, meaning the small open pitot tube -

Upon cleanup, when acetone was being squirted into probe, should the acetone was not going to the flask, further observation revealed that the probe tip was broken. Removed probe from station, noted a chip at the tip. Since "O" ring seals nozzle not to glass. Also observed that the nozzle was sticking tightly to the nut, which required extra torque, but we felt the probe was capable

QNC-3 b

FRONT HALF

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

FILTER NUMBER	0.4420	0.4313
tare	0.3735 g	0.3591
net	68.5 mg	72.2 mg

140.70 mg

LABORATORY RESULTS

CONTAINER _____ _____ mg

CONTAINER _____ _____ mg

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ ETHER-CHLOROFORM EXTRACTION _____ mg

CONTAINER _____ _____ mg

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

Rinse volumes _____ ml _____ ml _____ ml _____ ml _____ ml _____

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	295 ml	136 ml	8 ml	X ml	X ml	X
INITIAL VOLUME	100 ml	100 ml	0 ml	ml	ml	ml
NET VOLUME	ml	ml	ml	ml	ml	ml

about 85% spent.

SILICA GEL			
FINAL WEIGHT	503.4 g	g	g
INITIAL WEIGHT	475.0 g	g	g
NET WEIGHT	28.4 g	g	g

TOTAL MOISTURE 267.4

1067 ft³

ANALYTICAL DATA

NT WEST MORELAND COAL CO.

DATE JUN 23 1975

SAMPLING LOCATION QUINWOOD, W. Va.

SAMPLE TYPE PARTICULATE EPA METHOD 5

RUN NUMBER QNC-4

SAMPLE BOX NUMBER 2, glass set #2

CLEAN-UP MAN Banks

COMMENTS:

note since this set of glassware was blanked by the lady folks of the morning, when the 2nd clean probe was taken to the stack in anticipation that 2 runs could be made. However, one run was completed, and the morning set of glassware was returned to the vendor.

4/23 - Now probe to replace one chipped on Run QNC-3 - Had clean probe ready but test delay for background check. Plant operational problems, one steam line, pulverizer

1500 A - Probe at ball park - Ended test when strained on face of clean out

LABORATORY RESULTS

CONTAINER reading for front

Brought home from stack at 6:30 P

QNC-4 QNC-4a

FRONT HALF

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

	QNC-4	QNC-4a
FILTER NUMBER	0.4305	0.4193
tare	0.3760g	0.3649
net	54.5 mg	54.4 mg

108.9 mg

CONTAINER _____ _____ mg

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

ETHER-CHLOROFORM EXTRACTION _____ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

Rinse volumes _____ ml _____ ml _____ ml _____ ml _____ ml _____

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	343 ml	146 ml	12 ml	0 ml	0 ml	0 ml
INITIAL VOLUME	100 ml	100	0			
NET VOLUME	243 ml	46 ml	12 ml	ml	ml	ml

~ 80% Spent

SILICA GEL			
FINAL WEIGHT	502.6 g	g	g
INITIAL WEIGHT	475.0 g	g	g
NET WEIGHT	27.6 g	g	g

TOTAL MOISTURE 318.6 g

EPA (Dur) 231
4/72

ANALYTICAL DATA

PLANT West Maryland Coal Co.

DATE : JUN 24 1975 change to June 25 1975

SAMPLING LOCATION Quinwood W. Va

SAMPLE TYPE Particulate, EPA Method 5

RUN NUMBER QNC-5

SAMPLE BOX NUMBER one, box set #1

CLEAN-UP MAN Boyles

COMMENTS:

Plant operational problems, conveyor down for 2nd part, power broke in sample box. Was told 3 hr. run, stated plant would be non operational, stack sampling was postponed till tomorrow

6/25/75 - attempt to sample stack, plant problems appear to have been rectified -

FRONT HALF

ACETONE WASH OF NOZZLE, PROBE, CYCLONE (BYPASS), FLASK, FRONT HALF OF FILTER HOLDER

	QNC-5 filter got wet, scrubbed	QNC-5 & 1 1st part.	QNC-5(c)	LABORATORY RESULTS
FILTER NUMBER		0.4323	0.4045 g	mg
tare	0.3675 g	0.3758	0.3648 g	mg
net		56.5 mg	39.7 mg	

FRONT HALF SUBTOTAL _____ mg

BACK HALF

IMPINGER CONTENTS AND WATER WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

ETHER-CHLOROFORM EXTRACTION _____ mg

ACETONE WASH OF IMPINGERS, CONNECTORS, AND BACK HALF OF FILTER HOLDER

CONTAINER _____ _____ mg

BACK HALF SUBTOTAL _____ mg

TOTAL WEIGHT _____ mg

Rinse volumes _____ ml _____ ml _____ ml _____ ml _____ ml _____

MOISTURE

IMPINGERS	1	2	3	4	5	6
FINAL VOLUME	264 ml	158 ml	16 ml	2 ml	2 ml	2
INITIAL VOLUME	100 ml	100	t			
NET VOLUME	164 ml	58 ml	16 ml	ml	ml	ml

SILICA GEL ← about 90% spent

FINAL WEIGHT	506.2 g	g	g
INITIAL WEIGHT	475.0 g	g	g
NET WEIGHT	31.2 g	g	g

TOTAL MOISTURE 269.2 g

EPA (Dur) 231
4/72

Sample Drying Data

Work Performed by: [illegible] Project No. 2812-2714 Date of Work: June 14, 1975

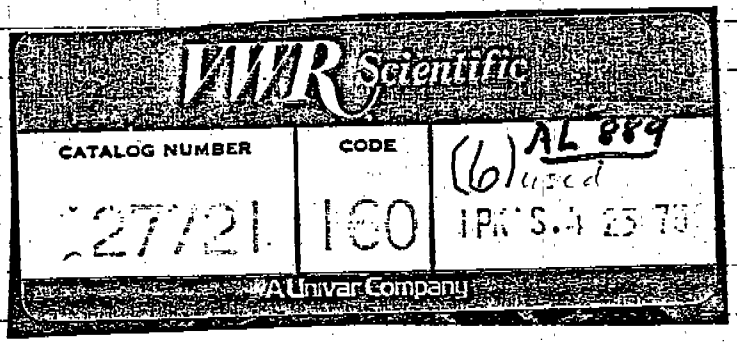
Title or Purpose: WESTMORELAND LAB RESULTS Continued from:

VWR cat # 27721

NORTON EXTRACTION THIMBLES AL 889 - code 160

Sample I.D	Final wt gm	Tare grams	Differ
WC 1		102.4000	
WC 2		88.2500	
WC 3		92.7890	
WC 4		75.0395	
WC 5		90.7577	
WC 6		71.1974	
WC 7		86.9437	
WC 8		87.7725	

catalog # VWR 27721 - code 160 norton AL 889



Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Baytor Project No. G 2872-2114 Date of Work: June 16, 1975

Title or Purpose: Continued from:

2d shipment

SAMPLE I.D.	Final wt. grams	Tare grams	Difference
WC 9		81.1489	
WC 10		83.2939	
WC 11		75.6314	
WC 12		91.3194	
WC 13		91.4694	
2d shipment picked up at Receiving by Jack Tabor, ~~[illegible]~~ oven dried			
AL-485 WC 14		81.4188	
WC 15		76.6560	
WC 16		92.9287	
WC 17		97.9510	
WC 18		88.9600	
WC 19		83.9500	
WC 20		86.6082	
WC 21		88.5314	

Entered by: Date: Continued to: p 36

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: R. Brown. Project No. D 2872-77 Date of Work:

Title or Purpose: Weights of Thimbles, Evaporation Continued from: p. 35

	Tare
WC. 22	84.8668
23	79.1908
24	78.6221
25	94.2849
26	94.9976
27	65.6762
28	77.9074
29	87.4730

B Ray Knudsen

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

C-50

Work Performed by: Project No. 9287-2714 Date of Work: June 18-, 1975

Title or Purpose: FIELD ~~DATA~~ INFORMATION Continued from:

The following pages will refer to observation, facts and notes obtained at the.

WESTMORELAND COAL COMPANY -
DIVISION OF PEERLESS SMOKELESS COAL COMPANY
QUINWOOD, WEST VIRGINIA.

BATTELLE PERSONEL

1. PAUL WEBB
2. DAVE TRAYSER
3. JOE MCNULTY
4. DON HUPP.
5. FRED RICE
6. KARL TURNER
7. BILL BAYLOS
8. MASON PILCHER
9. RON SNYDER
10. JACK TABOR
11. JIM GIESKIE

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Jack Tabor / Project No. D 2872-2714 Date of Work: June 18, 1975

Title or Purpose: FEED Samples Obtained for Siene Analysis - Continued from:

OBJECTIVE: To obtain a representative sample of the coal feed material being processed throughout the sampling run.

Procedure. Collection

Use of a collector is sweep beneath the flowing stream, according to the time schedule below - The feed is the collected into a 30 gallon wash tub, to obtain the representative sample, the.

Slot collector use ASTM (method D-197-30 reapproved 1971)

SIEVE PROCEDURE

Ref. ASTM - D-410-38 (Reapproved 1969) method was followed - strip mine / deep mine has fine

COAL BEING PROCESSED: Sewell #3 + 7

ratio (80 : 20) -

Sample collecting schedule for sweeping:

610 PM	612 PM		7:25	730	
625 PM	630	Sewell #7	740	745	Sewell #3
640	645		755	800	
650	700		810	815	
710	715	coal feed out.	840	845	
			910	915	← collect 30 min
			940	945	
			10:00	1003	end of sampling period.

note - ASTM method D 346-35 reapproved 1969 used for sample selection

SEWELL - coal ~~being~~ was processed during this run.

note all samples collected are split 3 ways. 1. Battelle - 4 qts 2. EPA - 4 qt 3. WESTMORELAND

Entered by: Wm C Boyton Date: June 19, 1975 Continued to: p. 39

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

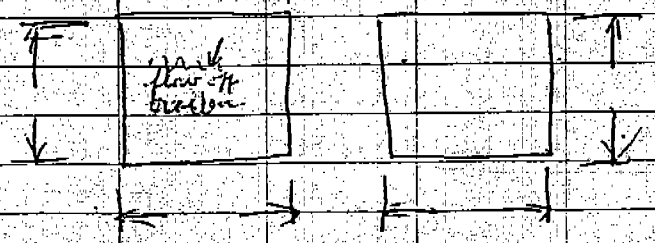
Work Performed by: Jack Tabor / C-52 Project No. H2872-2714 Date of Work: June 19, 1975
TO DAVID

Title or Purpose: FEED SAMPLES FOR SIEVE ANALYSIS Continued from: p 38

OBJECTIVE: Same as yesterday.

E W

Procedure - Same



COAL BEING PROCESSED Sewell #7

Sample

(LAST) - After the coal sample was collected, and upon reviewing the data of the particular collection train, a decision was made to discard the remains over the week-end, the entire 30 gallon collection was dumped back into the plants operation - thus eventually lost.

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

40

C-53

Work Performed by: Jack Taber Project No. 72872-2714 Date of Work: Friday 6/20/75

Title or Purpose: Collection of Representative Coal Sample being processed through plant. Continued from:

Coal processed in Sewell #7 plant. collected during Runs TH-3, TH-4 & QNC-3

Time collected

~~925~~
940
955
1100
1115
1130
1215
1230
1245
300
315

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

C-54

Work Performed by: Jack Tabor / Gene Riley Project No. G 2872 - 2714 Date of Work: June 23, 1975 monday

Title or Purpose: Continued from:

Note: Plant processing Pocahontas #3 this coal is being process, but is a blend of

blend ratio unknown

coal Processed { Pocahontas #6 / Sewell STRIP COAL } for Sieve analysis -

12:35P collected about the first before the conveyor broke down -

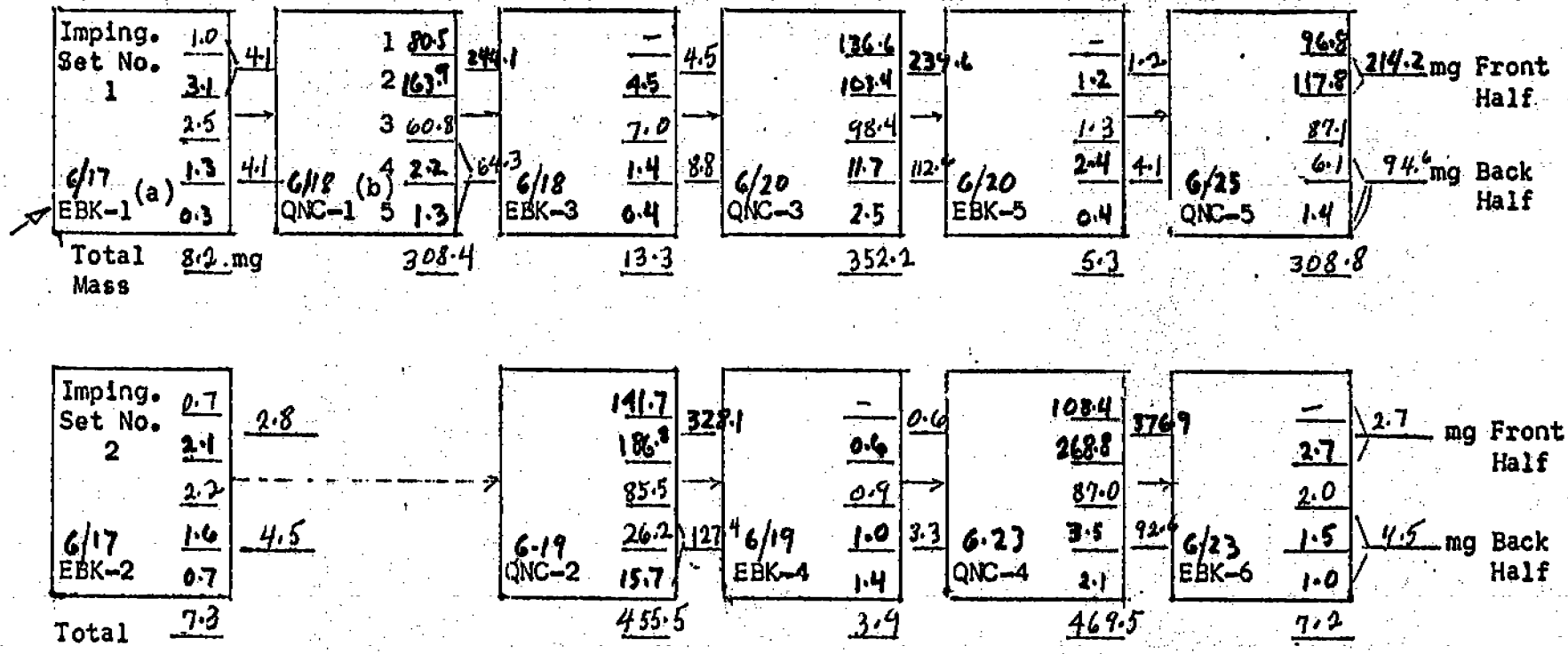
Time collected

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:



(a) EBK-__, indicates a clean-up set of samples (Background)
(b) QNC-__, indicates sample run
(c) Since one probe was used on all 5 runs, this sample set does not include a probe & nozzle wash.

note: A sample set includes, (1) Fiber glass filter, (2) Acetone rinse of nozzle, glass probe, & front half of filter holder, (3) Water and water rinse of impingers, back half of filter holder & connectors, (4) Chloroform & Ether extraction from the water and water rinse of the impingers, (5) Final acetone rinse of the impinger jars and connectors.

Date: Date: Date:

C-56

Work Performed by: Project No. 5) 2872- Date of Work:

Title or Purpose: Run # QNC-1 Continued from:

	EPA No. S-75-001	Final Wt. grams		Tare grams		Weight Change mg	Remarks
(1) Fiber Glass filter Filter No. QNC-1	-411	0.4396		0.3591		80.5	one filter
(2) Acetone rinse of nozzle, probe, & front half of filter holder QNC-1 Evap. dish No. 2 Total vol. 350 ml.	-412	40 39.0306 ✓		39.8667		163.9	
(3) Water & water rinse from imping. conn. & back half of filter holder QNC-1 Evap. dish No. 3 Total vol. 780 ml	-413	49.6186 7/11		49.5578 7/3		60.8	residue in water catch after evaporation, is very hygroscopic, and acidic.
(4) Chloroform & ether extract. of (3) above. (extracted first). QNC-1 Evap. dish No. 4 Total vol. ml	-414	49.0064 ✓		49.0042 7/3		2.2	
(5) Final acetone rinse of imping. jars and connec. QNC-1 Evap. dish No. 5 Total vol. 315 ml	-415	46.7864 ✓ 48		46.7851		1.3	

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Baytos Project No. D2872 - 2718 Date of Work:

Title or Purpose: Run QNC-2 Continued from:

Run 6/19/75

	EPA No. S-75-001	Final Wt. grams		Tare grams		Weight Change mg	Remarks
(1) Fiber Glass filter Filter No. QNC-2 / QNC-2b	-416	0.4148 ~~0.362~~ / 0.4585		0.3623 / 0.3693		52.5 / 89.2	141.7
(2) Acetone rinse of nozzle, probe, & front half of filter holder Evap. dish No. QNC-2/2 Total vol. 178 ml.	-417	41.8144 ✓		41.6276		186.8	has brown color extracted
(3) Water & water rinse from imping. conn. & back half of filter holder Evap. dish No. QNC-2/3 Total vol. 605 ml	-418	48.4781 ✓		48.3926		85.5	is darker
(4) Chloroform & ether extract. of (3) above. (extracted first) Evap. dish No. QNC-2/4 Total vol. ____ ml	-419	47.4198 ✓		47.3936		26.2	has (amber) oil residual
(5) Final acetone rinse of imping. jars and connec. Evap. dish No. QNC-2/5 Total vol. 320 ml	-420	47.2597 ✓		47.2440		15.7	has coal particles included

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Boynton Project No. 92812-27 Date of Work: June 28 -

Title or Purpose: QNC-3 Run QNC-3 Continued from:

Run 6/20/75

	EPA No. S-75-001	Final Wt. grams		Tare grams		Weight Change mg	Remarks
1) Fiber Glass filter Filter No. QNC-3 QNC3B	431	0.4412	6/20	0.3735		65.7	> 136.6
		0.4300		0.3591		70.9	
2) Acetone rinse of nozzle, probe, & front half of filter holder Evap. dish No. QNC3/2 Total vol. 194 ml.	432	44.5383 ✓	55	44.4349		103.4	
3) Water & water rinse from imping. conn. & back half of filter holder Evap. dish No. QNC3/2 Total vol. 840 ml	433	47.8684 ✓	20	47.7636		98.4	has only residue — which is hydrocarbons and acidics
4) Chloroform & ether extract. of (3) above. (extracted first) Evap. dish No. ___ Total vol. ___ ml	444	54.3903 ✓	3	54.3786		11.7	has amber color only residue
5) Final acetone rinse of imping. jars and connec Evap. dish No. QNC3/5 Total vol. 373 ml	445	45.6246 ✓	3	45.6221		2.5	has coal particles

Entered by: W Boynton Date: 7.2.75 Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Baytos Project No. Date of Work:

Title or Purpose: QNC- Run # QNC-4 Continued from:

Run JUNE 23, 1975

	EPA No. S-75-001	Final Wt. grams	Tare grams	Weight Change mg	Remarks
1) Fiber Glass filter Filter No. QNC-4	-441	0.4303 ~~0.4303~~	0.3760	54.3	108.4
QNC-4a	-441(a)	0.4190	0.3649	54.1	
2) Acetone rinse of nozzle, probe, & front half of filter holder Evap. dish No. QNC4/2 Total vol. 160 ml.	-442	36.4338	36.1650	268.8	
3) Water & water rinse from imping. conn. & back half of filter holder Evap. dish No. ___ Total vol. 815 ml	-443	.8074 7/12 46.7943	46.7074 47	87.0	residue in hydroscopic, acidic, use final weighing for solid determination 2d weight has abs moisture
4) Chloroform & ether extract. of (3) above. (extracted first) Evap. dish No. QNC-4/4 Total vol. ___ ml	-444	51.8768	51. 52. 51.8733 7/3	3.5	
5) Final acetone rinse of imping. jars and connec. Evap. dish No. ___ Total vol. 325 ml	-445	47.8672	47.8651	2.1	

Entered by: Baytos Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Pe

Title or I

Date of Work:

Continued from:

7.375

Tare
QNC 2/0

8820

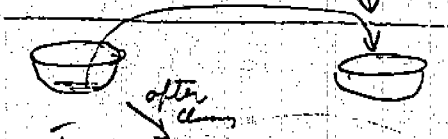
36.6279

254.1

Recheck
probe + nozzle
wash on
Run QNC-4

after scraper out from original

36.8820



= 254.1 gm

after cleaning

Tare
QNC-4/2

36.1763
1650
113

265.4

emarks

108.4

sidue is very
droscopic, and
ikes, use first
eighing for solids
eterminations
d weighing has absorbed
moisture

Entered by:

Date:

Continu

Work Performed by: Baylor Project No. Date of Work: 6-3) 7/4

Title or Purpose: QNC Run # QNC-5 Continued from:

Run. June 18, 1975 - Wednesday

	EPA No. S-75-001	Final Wt. grams		Tare grams		Weight Change mg	Remarks
1) Fiber Glass filter Filter No. QNC-5 b / QNC-5 a	-451	0.4328		0.3758		57.0	2 filters
		0.4046 ✓		0.3648		39.8	96.8
2) Acetone rinse of nozzle, probe, & front half of filter holder QNC-5 Evap. dish No. 2 Total vol. 188 ml.	-452	38.4794 ✓	(glass slicer removed before weighing)	38.3616		117.8	
3) Water & water rinse from imping. conn. & back half of filter holder QNC-5 Evap. dish No. 3 Total vol. 805 ml	-453	51.2592 ✓		51.1657		87.5	has only residue which is hygroscopic and acidic, use first weighing for weight change
4) Chloroform & ether extract of (3) above. (extracted first) QNC-5 Evap. dish No. 4 Total vol. ml	454	51.8846 ✓		51.8785 7/3		6.1	has only residue
5) Final acetone rinse of imping. jars and connec. QNC-5 Evap. dish No. 5 Total vol. 325 ml	-455	47.0740 ✓		47.0726		1.4	

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Bayton Project No. Date of Work:

Title or Purpose: Water, Solvent, and FILTER BLANKS Continued from:

	EPA No. S-75-001	Final Wt. grams		Tare grams		Weight Change mg	Remarks
1) Fiber Glass filter Filter No. BL	-493						3 blanks
2) Acetone rinse of nozzle, probe, & front half of filter holder Evap. dish No. GNC-B 2 Total vol. 200 ml.	-494	41.9904 6/30		41.9900 6/28		0.4	Burdick & Jackson distilled in glass acetone Lot # 7150
3) Water & water rinse from imping. conn. & back half of filter holder Evap. dish No. GNC-B 3 Total vol. 200 ml	-495	47.1578 ✓		47.1562 7/3		1.6	Baker Chemical - Lot # 43151 ETHER - LOT # 42825
4) Chloroform & ether extract of (3) above. (extracted first) Evap. dish No. GNC-B 4 Total vol. 150 ml	-496	45.2818 ✓ 7/7/75		45.2792 7/7		1.9	
5) Final acetone rinse of imping. jars and connec. Evap. dish No. ____ Total vol. ____ ml							

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Project No. Date of Work:

Title or Purpose: Blank - dishes which have not been added with anything. Continued from:

	EPA No. S-75-001	Final Wt. grams		Tare grams		Weight Change mg	Remarks
1) Fiber Glass filter Filter No.____							
2) Acetone rinse of nozzle, probe, & front half of filter holder Evap. dish No. GNC-B2/0 Total vol. 0 ml.		36.6280		36.6270		- 0.2	
3) Water & water rinse from imping. conn. & back half of filter holder Evap. dish No.____ Total vol. ____ml							
4) Chloroform & ether extract. of (3) above. (extracted first) Evap. dish No.____ Total vol.____ml							
5) Final acetone rinse of imping. jars and connec. Evap. dish No.____ Total vol.____ml							

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Bayto Project No. 92872-2718 Date of Work:

Title or Purpose: EBK - EBK-1 6/17/75 Continued from:

	EPA No. S-75-001	Final Wt. grams		Tare grams		Weight Change mg	Remarks
1) Fiber Glass filter Filter No.___	-401	0.3834		0.3824		1.0	
2) Acetone rinse of nozzle, probe, & front half of filter holder EBK-1/2 Evap. dish No.___ Total vol. 112 ml.	-402	47.2169 ✓ reduced 7-7-75		47.2138		3.1	
3) Water & water rinse from imping. conn. & back half of filter holder EBK-1/3 Evap. dish No.___ Total vol. 590 ml	-403	47.7828 ✓		47.7815		2.5	
4) Chloroform & ether extract of (3) above. (extracted first) EBK-1/4 Evap. dish No.___ Total vol.___ ml	-404	45.8036 ✓		45.8011		1.3	
5) Final acetone rinse of imping. jars and connec. EBK-1/5 Evap. dish No.___ Total vol. ~~112~~ 325 ml	-405	48.0908 ✓		48.0905		0.3	evaporation residue was in bottom of jar

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Zenyon Project No. 12822-2718 Date of Work:

Title or Purpose: EBK-2 EBK-2 6/17/75 Continued from:

	EPA No. S-75-001	Final Wt. grams	Tare grams	Weight Change mg	Remarks
1) Fiber Glass filter Filter No.____	-406	0.3719	0.3712	0.7	
2) Acetone rinse of nozzle, probe, & front half of filter holder EBK-2/2 Evap. dish No.____ Total vol. 84 ml.	-407	38.5322 7/7/75	38.5294	2.1	
3) Water & water rinse from imping. conn. & back half of filter holder EBK-2/3 Evap. dish No.____ Total vol. 580 ml	-408	46.4204	46.4188	2.2	
4) Chloroform & ether extract of (3) above. (extracted first) Evap. dish No. EBK-2/4 Total vol.____ ml	-409	47.1795	47.1773	1.6	
5) Final acetone rinse of imping. jars and connec. Evap. dish No. EBK-2/5 Total vol. 84 ml 320	-410	51.4284	51.4277	0.7	

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Baytor Project No. 9/2872-2718 Date of Work:

Title or Purpose: EBK-3 EBK-3 6/18/75 Continued from:

	EPA No. S-75-001	Final Wt. grams		Tare grams		Weight Change mg	Remarks
1) Fiber Glass filter Filter No.____	421	—		—		—	extra filter no available based of EBK 1+2 [illegible]
2) Acetone rinse of nozzle, probe, & front half of filter holder EBK 3/2 Evap. dish No.____ Total vol. 130 ml.	422	46.4100 .4091 ✓ 7/7/75		46.4046		4.5	has coal particles
3) Water & water rinse from imping. conn. & back half of filter holder EBK 3/3 Evap. dish No.____ Total vol. 560 ml	423	47.6862 ✓		47.6848		7.0	
4) Chloroform & ether extract. of (3) above. (extracted first) EBK 3/4 Evap. dish No.____ Total vol.____ ml	424	52.9870 ✓		52.9800		1.4	
5) Final acetone rinse of imping. jars and connec. EBK 3/5 Evap. dish No.____ Total vol. ~~130~~ 325 ml	425	48.6661 ✓		48.6657		0.4	

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

C-67

Work Performed by: Project No. Date of Work:

Title or Purpose: EBK-4 EBK-4 6/19/75 Continued from:

	EPA No. S-75-001 Final Wt. grams		Tare grams		Weight Change mg	Remarks
1) Fiber Glass filter Filter No.____	—		—		—	extra filter not available, not gain assumed to be 0
2) Acetone rinse of nozzle, probe, & front half of filter holder EBK 4/2 Evap. dish No.____ Total vol. 35 ml.	-427	46.2927 OV 7/7/75		46.2921	0.6	does not have particulate
3) Water & water rinse from imping. conn. & back half of filter holder EBK 4/3 Evap. dish No.____ Total vol. 540 ml	-428	46.3531 ✓		46.3521	0.9	
4) Chloroform & ether extract. of (3) above. (extracted first) Evap. dish No. EBK-4/4 Total vol.____ ml	-429	48.3390 ✓		48.3381	1.0	
5) Final acetone rinse of imping. jars and connec EBK 4/5 Evap. dish No.____ Total vol. 305 ml	-430	42.3256 ✓		42.3242	1.4	has black particulate in dish

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Baytos Project No. 12872-2718 Date of Work:

Title or Purpose: EBK-5 EBK-5 6/20/75 Continued from:

	EPA No. S-75-001	Final Wt. grams		Tare grams		Weight Change mg	Remarks
1) Fiber Glass filter Filter No.____	436	—		—		—	extra filter not available Blank assumed to be 0.7 mg
2) Acetone rinse of nozzle, probe, & front half of filter holder Evap. dish No. EBK5/2 Total vol. 63 ml.	-437	45.7058 2 ✓7/7/75		45.7040 ~~38.2197~~		1.2	has carbon particles
3) Water & water rinse from imping. conn. & back half of filter holder Evap. dish No. EBK-5/3 Total vol. 510 ml	-438	42.0987 ✓		42.0963		1.3	
4) Chloroform & ether extract. of (3) above. (extracted first) Evap. dish No. EBK5/4 Total vol.____ ml	-439	47.6579 ✓		47.6566		2.4	
5) Final acetone rinse of imping. jars and connec. Evap. dish No. EBK-5/5 Total vol. 295 ml	440	47.0189 ✓		47.0185		0.4	

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: | Project No. | Date of Work:

Title or Purpose: EBK-6 EBK-6 6/23/75 | Continued from:

	EPA No. S-75-001 Final Wt. grams		Tare grams	Weight Change mg	Remarks
1) Fiber Glass filter Filter No.____	-446	—	—	—	extra filter not available -
2) Acetone rinse of nozzle, probe, & front half of filter holder EBK-6/2 -447 Evap. dish No.____ Total vol. 62 ml.	39.5174 08 7/7/75		39.5081	2.7	trace coal particles in dish -
3) Water & water rinse from imping. conn. & back half of filter holder EBK-6/3 -448 Evap. dish No.____ Total vol. 552 ml	48.4605		48.4590	2.0	
4) Chloroform & ether extract of (3) above. (extracted first) EBK-6/4 -449 Evap. dish No.____ Total vol.____ ml	47.6573		47.6553	1.5	
5) Final acetone rinse of imping. jars and connec. EBK-6/5 -450 Evap. dish No.____ Total vol. 320 ml	48.8036		48.8026	1.0	

Entered by: | Date: | Continued to:

Performances of this work observed by: | Disclosed to and understood by me:

Date: | Date:

Date: | Date:

Work Performed by: Baytos Project No. 92782-2718 Date of Work: July 5, 1975

Title or Purpose: Determination of Total Solids in Return Water from Venturi Scrubber to Clarifier - (See Pre-Survey Report, 6/6/75, E. Salinity Procedure - Filter 50.0 ml of water through glass fiber filter (47 mm), dry to constant weight -

Continued from:

Sample Date	EPA No 9-75001-	Dish #	Final Wt.	Tare	weight CHANGE	1000 ml / 50 ml = 20
			- DISSOLVED	SOLIDS -		x20 mg/l
June 19, 1975	-565		50.0562	50.0051	51.1 mg/50 ml	1022.0
not filtered TOTAL SOLIDS	-565a		48.2990	44.4170	3.8820 g/50 ml	7.76%
				TS % =		
JUNE 20, 1975	-566		48.1781	48.1157	62.4 mg/50 ml	1248.0
not filtered TOTAL SOLIDS	566a		54.6225	50.1800	4.4425 g/50 ml = x	8.88
June. 23, 1975	-581		49.7584	49.7102	48.2 mg/50 ml	964.0
not filtered TOTAL SOLIDS	581a		50.8469	46.6091	4.23 g/50 ml =	8.4
JUNE 25, 1975	-582		45.1005	45.0572	43.3 mg/50 ml =	866.0
not filtered TOTAL SOLIDS	582a		50.0554	46.4970	3.558 g/50 ml =	7.12%
Blank.	—		47.3746	47.3742	0.4	

Entered by: W. Baytos Date: 7.5.-7.75 Continued to: p 63

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Project No. 92872-218 Date of Work: July 5, 1975

Continued from: p. 62

Title or Purpose:

FILTERS FOR SUSPENDED SOLIDS.

FILTER #	FINAL WT.	TARE	WT. diff.		TOTAL Susp. Solids
565	3.9404	0.1203	3.8201 g		7.64 %
566	4.4618	0.1186	4.3432 g	x 2	8.69 %
581	3.9904	0.1188	3.8716 g	x 2	7.74 %
582	3.5900	0.1191	3.4709 g	x 2	6.94 %
Blank	0.1185	0.1181	0.4		

Entered by: W Boynton Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

FRONT HALF DATA

C-72

G 2872-9024
Westmoreland CoalCo.
Quinwood, West Virginia
June 30, 1975

MASS COLLECTED ON THE OUTLET SIDE OF THE VENTURI SCRUBBER

Run Number	Date	Acetone wash of probe mg	Corrected (a) for acetone blank mg	Filter Catch mg	Total Mass, mg. front half
QNC-1	6/18/75	163.9	350 ml x 2 mg/ml = 0.3 mg 163.6	80.5	26.5 244.1
QNC-2	6/19/75	186.8	178 ml x 2 mg/ml = 0.35 mg 186.4	52.5 / 89.2 — 141.7	248.1 (b) 328.1
QNC-3	6/20/75	103.4	194 ml x 2 mg/ml = 0.38 mg 103.0	65.7 / 70.9 — 136.6	267.4 239.6
QNC-4	6/23/75	268.8	160 ml x 2 mg/ml = 0.320 mg 268.5	51.3 / 54.1 — 108.4	318.6 376.9
QNC-5	6/25/75	117.8	188 ml x 2 mg/ml = 0.38 117.4	57.0 / 39.8 — 96.8	269.2 214.20

(a) ACETONE CORRECTON : 2 mg/ml

(b) FILTER BROKE DURING 2nd TRAVERSE OF STACK.

Work Performed by: Boyton Project No. 9 2872-2715 Date of Work: July 13, 1975

Title or Purpose: Front Half. - Acetone Probe Wash. Continued from:
— THIMBLE RINSE - INLET TO VENTURI SCRUBBER.
These are the gravimetric data obtained on the "front half." of the thimble. (MORE FILTER WEIGHTS IN FIELD DATA SHEETS BOOK.)

RUN # SAMPLE I.D. DIST No	EPA # S75-001	FINAL WT. grams.	TARE	DIFF mg.	REMARKS
TH-1	-551	48.6941	48.6567	37.4	
TH-2	558	46.3590	46.3445	14.5	
TH-3					
TH-4	-570	44.1265	44.1206	5.9	
TH-5	-576	47.0393	46.3228	716.5	
TH-6	-586	46.5904	46.5175	272.9	
TH. Blank-	—	36.9188	36.9196	- 0.8	

Entered by: Boyton Date: 7-13-7-15/75 Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Work Performed by: Boyton Project No. 2872-2718 Date of Work: Jun 13, 1975

Title or Purpose: Acetone Wash from Cyclone Continued from:

These acetone washes were collected from the cyclone particle catch, ~~which~~ by Mac Light - EPA) and requested to dry by PCC.

Run #	DSA # 5a	EPA No. 5-15001	Final Wt.	Tare ~~Tare~~	Diff. mg.	Remarks
5C	468	468	36.3908	36.3823	8.5	
7C	474	-474	38.8641	38.8568	7.3	
	-478	-478	37.5464	37.5452	1.2	
9C F wash	482	-482	37.5144	37.5084	6.0	
	483	-483	38.4946	38.4870	7.6	
9C DI cyc wash	484	-484	42.5900	42.5452	4.8	
10C Blank wash	10c -488	-488	35.1577	35.1542	3.5	
10C wash		-489	42.3122	42.3060	6.2	
10C Filter wash		-490	38.5644	38.5604	4.0	
Acetone Blank		-491	35.5250 4	35.5252	0.2 /100 cc	
Acetone CC. Run 10C repeat		-492	48.3244 22	48.3218	0.4 /100 cc	

Entered by: Date: Continued to:

Performances of this work observed by: Disclosed to and understood by me:

Date: Date:

Date: Date:

Visible Emission

Heavy Equipment Exit Revised

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RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal Co.
LOCATION Quinwood, W. Va.
TEST NUMBER 1
DATE June 12, 1975
TYPE FACILITY Coal Cleaning
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION 50 Minutes
OBSERVER Mason Fisher
OBSERVER CERTIFICATION DATE May 27, 1975
OBSERVER AFFILIATION Battelle Columbus
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT 75'

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME — INITIAL ___:___ a.m. 6:09 p.m. — FINAL ___:___ a.m. 6:57 p.m.

OBSERVER LOCATION
- Distance to Discharge 400 feet
- Direction from Discharge North-west
- Height of Observation Point 50 feet (above base of stack)

BACKGROUND DESCRIPTION Sky (20% clouds)

WEATHER CONDITIONS
- Wind Direction From North
- Wind Speed 0-5 MPH
- Ambient Temperature 75° F

SKY CONDITIONS (clear, overcast, % clouds, etc.) 20% clouds (clear)

PLUME DESCRIPTION
- Color Black with steam plume near stack
- Distance Visible 150 - 300 feet

MINUTES OF NONCOMPLIANCE —

C-77

OBSERVATION RECORD

COMPANY Westmoreland Coal

LOCATION Dunwood W. Va.

TEST NUMBER 1

DATE June 18, 1975

OBSERVER Mason Pitcher

TYPE FACILITY Coal Cleaning

POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
0	0	15	15	15	15	Always		6:09 PM
0	1	15	15	15	15			6:10
0	2	15	15	15	15			6:11
0	3	15	15	20	15			6:12
0	4	15	15	15	15			6:13
0	5	15	15	20	20			6:14
0	6	15	20	20	20			6:15
0	7	20	20	15	15			6:16
0	8	15	15	15	15			6:17
0	9	15	15	15	10			6:18
0	10	15	15	10	10			6:19
	11	15	15	15	10			6:20
	12	15	15	15	15			6:21
	13	20	25	20	15			6:22
	14	15	15	15	15			6:23
	15	15	15	15	15			6:24
	16	15	10	10	10			6:25
	17	10	10	10	15			6:26 Wind plume
	18	15	15	10	10			6:27
	19	10	15	15	10			6:28
	20	15	10	10	15			6:29
	21	15	10	15	20			6:30
	22	15	15	15	15			6:31
	23	15	15	15	20			6:32
	24	15	15	15	15			6:33
	25	15	10	10	15			6:34
	26	15	20	20	15			6:35
	27	15	15	15	15			6:36
	28	15	10	10	10			6:37
	29	10	10	15	15			6:38

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal

LOCATION Quinwood W. Va.

TEST NUMBER 1

DATE June 18, 1975

OBSERVER Mason Pitcher

TYPE FACILITY Coal Cleaning

POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
0	30	15	15	15	15	Always		6:39
0	31	10	10	10	10			6:40
0	32	10	10	10	10			6:41 Reduced steam plume
	33	10	10	10	10			6:42
	34	10	10	5	5			6:43
	35	5	5	10	10			6:44
	36	10	10	10	10			6:45
	37	10	10	10	10			6:46
	38	10	10	10	10			6:47
	39	5	10	10	10			6:48
	40	15	10	10	10			6:49
	41	15	15	10	10			6:50
	42	5	5	5	5			6:51
	43	5	5	5	5			6:52
	44	5	5	5	5			6:53
	45	5	5	5	5			6:54
	46	10	10	10	10			6:55
	47	10	10	10	5			6:56
	48	5	5	5	5			6:57
	49	5	5	5	5			6:58
	50	5	5	5	5			6:59 Sun-down
	51							7:00
	52							
	53							
	54							
	55							
	56							
	57							
	58							
	59							

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Reader #1

RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal Co.
LOCATION Quinwood, W. Va.
TEST NUMBER 2
DATE June 19, 1975
TYPE FACILITY Coal Cleaning
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION
OBSERVER Mason Pilcher
OBSERVER CERTIFICATION DATE May 27 1975
OBSERVER AFFILIATION Battelle Columbus
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT 76'

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME INITIAL ___:___ a.m. 3:10 p.m. FINAL ___:___ a.m. 6:50 p.m.

OBSERVER LOCATION
- Distance to Discharge 400 feet
- Direction from Discharge North-west
- Height of Observation Point 50 feet above base of stack

BACKGROUND DESCRIPTION Sky (50% clouds)

WEATHER CONDITIONS
- Wind Direction from South-west
- Wind Speed 5-10 MPH
- Ambient Temperature 80°F

SKY CONDITIONS (clear, overcast, % clouds, etc.) 50% clouds

PLUME DESCRIPTION
- Color Black with ~~water-vapor plume~~ steam plume near stack
- Distance Visible 100 - 300 feet

MINUTES OF NONCOMPLIANCE —

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 2
DATE June 19, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
0	0	20	15	20	15	Always		3:10 pm
0	1	20	15	10	15			3:11
0	2	15	15	20	15			3:12
0	3	15	20	15	15			3:13
0	4	15	20	15	15			3:14
0	5	20	20	20	15			3:15
0	6	15	15	10	10			3:16
0	7	10	10	10	10			3:17
0	8	10	15	15	15			3:18
0	9	10	10	10	15			3:19
0	10	15	15	15	15			3:20
0	11	15	15	15	15			3:21
0	12	20	20	15	15			3:22
0	13	15	10	15	15			3:23
0	14	10	10	10	10			3:24
0	15	10	15	15	15			3:25
0	16	10	15	15	10			3:26
0	17	10	15	15	15			3:27
0	18	15	15	15	15			3:28
0	19	15	20	20	20			3:29 Small steam plume
0	20	20	20	20	25			3:30 " " "
0	21	25	30	25	20			3:31 " " "
0	22	15	20	20	20			3:32
0	23	20	15	15	15			3:33 Renewed steam plume
0	24	15	15	15	15			3:34
0	25	15	15	15	15			3:35
0	26	15	20	25	20			3:36
0	27	20	20	20	20			3:37
0	28	15	15	15	10			3:38
0	29	10	10	10	10			3:39

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Nuttall, W. Va.
TEST NUMBER 2
DATE June 19, 1975

OBSERVER Mason Fisher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
0	30	10	10	10	10	Always		3:40
0	31	15	15	10	10			3:41
0	32	10	10	10	10			3:42
0	33	15	10	15	15			3:43
0	34	10	15	15	20			3:44
0	35	20	15	15	15			3:45
0	36	20	20	20	20			3:46 Light water vapor
0	37	20	20	20	20			3:47
0	38	20	20	20	20			3:48
0	39	20	15	15	20			3:49
0	40	20	20	15	20			3:50
0	41	20	15	15	15			3:51
0	42	20	20	20	20			3:52
0	43	30	20	20	20			3:53
0	44	20	20	20	25			3:54
0	45	25	25	25	25			3:55
0	46	20	20	20	20			3:56
0	47	20	20	30	30			3:57
0	48	35	30	25	25			3:58
0	49	30	30	30	30			3:59
0	50	30	20	25	25			4:00
0	51	20	20	20	15			4:01
0	52	15	10	15	15			4:02
0	53	15	20	15	20			4:03 No water vapor
0	54	25	20	15	15			4:04 " " "
0	55	15	20	20	20			4:05 Slight " "
0	56	15	20	20	25			4:06
0	57	30	35	40	40			4:07
0	58	30	25	20	15			4:08 Some " "
0	59	15	10	10	15			4:09

OBSERVATION RECORD

COMPANY Westmoreland Coal

LOCATION Osmond, W. Va.

TEST NUMBER 2

DATE June 19, 1975

OBSERVER Mason Pilcher

TYPE FACILITY Coal Cleaning

POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1	0	15	20	20	20	N.A.		4:10
1	1	20	25	30	25			4:11
1	2	25	25	25	25			4:12
1	3	25	30	25	20			4:13
1	4	15	15	20	20			4:14
1	5	20	15	10	10			4:15
1	6	10	10	10	15			4:16
1	7	10	10	10	15			4:17
1	8	20	20	15	15			4:18
1	9	20	25	25	20			4:19
1	10	15	15	10	10			4:20
1	11	15	15	15	15			4:21
1	12	20	15	10	10			4:22
1	13	10	15	15	15			4:23
1	14	15	15	15	15			4:24
1	15	15	15	15	15			4:25
1	16	20	20	25	30			4:26
1	17	25	30	25	20			4:27
1	18	15	15	10	10			4:28
1	19	10	10	15	20			4:29 Light water vapor
1	20	20	20	15	15			4:30
1	21	15	20	25	25			4:31
1	22	25	25	30	30			4:32
1	23	30	30	30	30			4:33
1	24	35	30	25	30			4:34
1	25	30	30	25	30			4:35
1	26	25	30	30	25			4:36
1	27	25	25	30	35			4:37
1	28	30	35	35	30			4:38
1	29	30	30	30	35			4:39

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Dunmont, W. Va.
TEST NUMBER 2
DATE June 19 1975

OBSERVER Mason Dilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1	30	35	35	30	25			4:40 +1
1	31	30	30	30	35			4:41
1	32	—	—	—	—			Missed two minutes
1	33	—	—	—				
1	34	10	10	10	10			4:44
1	35	10	10	10	5			4:45
1	36	10	15	15	15			4:46
1	37	15	15	20	20			4:47
1	38	20	20	20	15			4:48
1	39	10	15	15	20			4:49
1	40	20	25	25	20			4:50
1	41	15	20	20	15			4:51
1	42	15	10	10	10			4:52
1	43	15	15	15	15			4:53
1	44	10	10	10	10			4:54
1	45	15	15	10	10			4:55
1	46	10	15	15	15			4:56
1	47	15	15	15	15			4:57
1	48	15	15	15	10			4:58
1	49	10	15	15	15			4:59
1	50	20	20	20	20			5:00
1	51	20	20	25	25			5:01
1	52	25	30	30	30			5:02
1	53	30	25	25	30			5:03
1	54	30	30	30	30			5:04
1	55	30	30	35	30			5:05
1	56	30	25	30	30			5:06
1	57	30	30	30	30			5:07
1	58	30	30	35	35			5:08

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 2
DATE June 19 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
2	0	35	35	25	35			5:10 +1
2	1	30	30	30	30			5:11
2	2	30	30	30	30			5:12
2	3	30	30	30	30			5:13
2	4	30	25	25	25			5:14
2	5	30	30	30	35			5:15
2	6	35	30	30	25			5:16
2	7	20	20	20	20			5:17
2	8	20	25	20	25			5:18
2	9	25	20	20	25			5:19
2	10	20	30	20	25			5:20
2	11	30	30	30	30			5:21
2	12	25	25	25	30			5:22
2	13	30	30	30	25			5:23
2	14	25	25	20	15			5:24
2	15	15	15	20	20			5:25
2	16	15	15	20	15			5:26
2	17	20	20	20	20			5:27
2	18	20	20	25	20			5:28
2	19	20	20	20	15			5:29
2	20	15	20	20	20			5:30
2	21	20	20	20	20			5:31
2	22	25	25	20	25			5:32
2	23	20	20	20	20			5:33
2	24	20	20	15	15			5:34
2	25	15	15	15	10			5:35
2	26	10	15	10	10			5:36
2	27	10	10	10	10			5:37
2	28	10	10	10	10			5:38
2	29	10	10	15	15			5:39

C-85

OBSERVATION RECORD
(Cont.)

COMPANY Weirton Steel Co.
LOCATION Dunwood W. Va.
TEST NUMBER 2
DATE June 19, 1975

OBSERVER Mason Blake
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
2	30	15	15	15	15			5:01
2	31	15	15	15	15			5:01
2	32	15	15	10	10			5:02
2	33	10	10	10	10			5:03
2	34	10	10	15	20			5:04
2	35	20	20	15	15			5:05
2	36	15	15	15	15			5:06
2	37	15	15	15	15			5:07
2	38	15	15	15	20			5:08
2	39	20	20	20	20			5:09
2	40	15	15	15	20			5:10
2	41	20	20	20	20			5:11
2	42	20	20	20	20			5:12
2	43	20	20	20	20			5:13
2	44	20	20	20	20			5:14
2	45	20	20	20	20			5:15
2	46	20	20	20	20			5:16
2	47	20	20	20	20			5:17
2	48	15	15	10	15			5:18
2	49	15	15	15	15			5:19
2	50	10	10	10	10			6:00 Stopped Reading
2	51							
2	52							
2	53							
2	54							
2	55							
2	56							
2	57							
2	58							

C-86

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Diamond, W. Va.
TEST NUMBER 2
DATE June 19, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
3	0	15	15	15	15			6:43
3	1	10	20	20	10			6:44
3	2	5	10	25	30			6:45
3	3	20	20	20	20			6:46
3	4	20	20	20	20			6:47
3	5	20	20	25	20			6:48
3	6	20	20	20	25			6:49
3	7	20	20	25	30			6:50
3	8	30	20	15				6:51.5 Lapsed Reading
3	9							
3	10							
3	11							
3	12							
3	13							
3	14							
3	15							
3	16							
3	17							
3	18							
3	19							
3	20							
3	21							
3	22							
3	23							
3	24							
3	25							
3	26							
3	27							
3	28							
3	29							

Reader #1

C-87

RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY [illegible]
LOCATION [illegible]
TEST NUMBER 3
DATE June 20, 1975
TYPE FACILITY Coal Cleaning
CONTROL DEVICE [illegible]

HOURS OF OBSERVATION 3 [illegible]
OBSERVER [illegible]
OBSERVER CERTIFICATION DATE [illegible] 1975
OBSERVER AFFILIATION [illegible]
POINT OF EMISSIONS [illegible]
HEIGHT OF DISCHARGE POINT 76'

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME INITIAL 9 : 40 a.m. FINAL ___ : ___ a.m.
___ : ___ p.m. 4 : 27 p.m.

OBSERVER LOCATION
Distance to Discharge 3A — 09.40 to 1300 hrs (3 hrs + 20 min)
3B — 1504 to 1628 hrs (1 hr + 24 min)
Direction from Discharge South East of [illegible]
Height of Observation Point 40 feet above [illegible]
BACKGROUND DESCRIPTION Sky (100% [illegible])
WEATHER CONDITIONS
Wind Direction from N-E
Wind Speed 0-5 MPH
Ambient Temperature [illegible]
SKY CONDITIONS (clear, overcast, % clouds, etc.) Overcast
PLUME DESCRIPTION
Color Black
Distance Visible 300 feet
MINUTES OF NONCOMPLIANCE —

C-89

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 3
DATE June 20 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	30					Almost		
	31					Always		
	32							
	33							
	34							
	35							
	36							
	37							
	38							
	39							
9	40	15	15	15	15			Start @ 9:40 AM
9	41	20	20	20	20			Steam Plume = 150'
9	42	20	20	25	25			Smoke Plume = 200'
9	43	25	25	25	25			
9	44	25	25	25	25			
9	45	20	20	20	25			
9	46	25	25	25	25			
9	47	20	20	20	25			
9	48	30	30	25	25			
9	49	25	25	30	30			
9	50	30	30	30	30			
9	51	30	30	25	25			Steam Plume = 100'
9	52	20	20	25	30			Smoke Plume = 200'
9	53	30	30	30	35			
9	54	25	30	30	30			
9	55	30	25	25	25			
9	56	25	25	30	30			
9	57	30	30	30	30			
9	58	25	25	30	30			

C-90

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood W Va.
TEST NUMBER 3
DATE June 29 1973

OBSERVER Mason Fisher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
10	0	25	25	25	20	Almost		Steam Plume = 75'
10	1	20	20	20	20	Always		Smoke Plume = 150'
10	2	20	15	10	10			Shut Down
10	3	10	10	10	10			
10	4	10	10	10	15			
10	5	15	15	15	15			Wind increasing
10	6	15	20	20	20			
10	7	20	25	20	20			
10	8	20	20	20	20			
10	9	15	15	20	20			
10	10	20	15	15	15			
10	11	15	15	20	20			
10	12	25	20	20	20			
10	13	15	15	15	10			Steam Plume = 100'
10	14	10	10	10	10			Smoke Plume = 250'
10	15	10	10	10	10			
10	16	10	10	15	15			
10	17	20	20	20	20			
10	18	20	20	25	30			
10	19	25	20	20	20			
10	20	25	25	20	20			
10	21	20	20	20	25			
10	22	25	25	20	25			
10	23	25	20	20	20			
10	24	20	20	20	20			
10	25	20	20	20	25			
10	26	25	20	20	20			
10	27	20	15	15	20			
10	28	20	25	25	20			
10	29	25	25	30	30			

C-91

OBSERVATION RECORD
(Cont.)

COMPANY Weirton Steel Coal
LOCATION Summit, W. Va.
TEST NUMBER 3
DATE June 20 1975

OBSERVER Mark Pitcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
10	30	35	30	30	35	Always		
10	31	25	25	20	20			
10	32	20	20	20	20			
10	33	20	20	20	25			Steam Plume = 0
10	34	20	20	20	20			Smoke Plume = 25
10	35	20	20	20	20			
10	36	20	20	20	20			
10	37	20	20	20	20			
10	38	25	25	20	20			
10	39	20	20	25	25			
10	40							Discussion with Henry Bingham (EPA)
10	41							
10	42							
10	43							
10	44							
10	45							
10	46							
10	47							
10	48							
10	49							
10	50							
10	51							
10	52							
10	53							
10	54							
10	55							
10	56	35	40	40	40			
10	57	40	40	35	40			
10	58	40	35	35	40			

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Dunmore W. Va
TEST NUMBER 3
DATE June 20 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
11	0	45	40	45	45	Attached		
11	1	45	40	45	40			Steam Plume = 100'
11	2	40	40	40	40			Smoke Plume = 250'
11	3	40	35	35	35			Probe inserted (inlet)
11	4	35	30	30	30			" withdrawn
11	5	30	30	30	30			
11	6	30	30	35	35			
11	7	25	25	30	30			
11	8	35	35	30	35			
11	9	35	35	35	35			Probe inserted again (11:10)
11	10	35	30	30	35			
11	11	35	35	35	35			
11	12	35	30	30	35			
11	13	30	30	35	35			
11	14	30	25	30	35			
11	15	35	35	35	35			
11	16	35	30	30	35			
11	17	35	40	35	35			
11	18	35	40	40	35			
11	19	30	30	35	35			
11	20	35	40	40	40			
11	21	35	35	35	35			
11	22	40	40	40	40			
11	23	40	35	35	30			
11	24	30	30	30	35			
11	25	35	35	35	35			
11	26	35	40	40	35			
11	27	35	35	35	30			
11	28	30	35	30	30			
11	29	30	30	35	30			

C-93

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Dunwood W. Va
TEST NUMBER 3
DATE Sept 20, 1975

OBSERVER Mason Pitcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
11	30	30	30	25	25	Al		
"	31	25	25	25	25			
"	32	25	25	25	25			
"	33	25	25	25	25			
"	34	25	35	35	35			
"	35	35	30	30	30			
"	36	30	30	25	20			
"	37	25	25	25	25			
"	38	25	30	30	30			
"	39	30	35	35	35			
"	40	35	30	35	35			
"	41	35	30	30	30			
"	42	30	30	30	30			
"	43	30	30	30	30			
"	44	30	30	30	35			
"	45	35	30	30	35			
"	46	25	35	30	30			
"	47	30	30	30	30			
"	48	35	30	30	30			
"	49	30	30	30	30			
"	50	30	30	30	30			Steam Plume = 150'
"	51	30	30	30	30			Smoke Plume = 200'
"	52	30	30	30	30			
"	53	25	30	30	30			
"	54	30	30	30	30			
11	55	30	30	25	30			
"	56	30	30	30	30			
"	57	30	30	30	30			
"	58	25	25	25	30			

OBSERVATION RECORD

COMPANY Westmoreland Coal

LOCATION Quinwood, W. Va.

TEST NUMBER 3

DATE June 20, 1975

OBSERVER Mason Pilcher

TYPE FACILITY Coal Cleaning

POINT OF EMISSIONS Venturi Scrubber

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
12	0	20	25	30	30	Attached		Steam Plume = 150'
12	1	30	30	30	25			Smoke Plume = 250'
12	2	25	20	20	15			
12	3	15	20	20	20			Inserted Probe (inlet)
12	4	20	20	20	20			
12	5	20	20	20	20			
12	6	20	20	25	25			
12	7	25	25	25	25			
12	8	25	20	20	25			
12	9	25	20	20	20			
12	10	20	15	15	15			
12	11	20	20	20	20			
12	12	20	20	20	20			
12	13	20	20	25	25			
12	14	25	20	20	20			
12	15	20	20	20	25			Probe removed (Inlet)
12	16	25	30	30	30			
12	17	30	30	25	25			
12	18	25	25	30	30			
12	19	30	30	30	30			
12	20	30	30	30	30			
12	21	35	35	35	35			
12	22	40	40	35	35			
12	23	30	30	30	30			
12	24	30	35	35	35			
12	25	35	35	40	40			
12	26	35	35	35	35			
12	27	35	35	35	35			
12	28	35	30	30	30			
12	29	30	30	30	30			

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Dunwood W. Va.
TEST NUMBER 3
DATE June 20 1975

OBSERVER Mason Fisher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Venturi Scrubber

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
12	30	35	40	40	40			
12	31	40	40	35	40			
12	32	40	40	35	35			
12	33	40	40	40	40			
12	34	40	40	40	40			
12	35	40	40	35	35			
12	36	40	35	30	30			
12	37	30	30	35	35			
12	38	35	35	35	35			Steam Plume = 100'
12	39	35	35	40	40			Smoke Plume = 200'
12	40	40	40	40	40			
12	41	40	35	35	35			
12	42	40	40	40	35			
12	43	35	35	35	35			
12	44	35	30	30	30			
12	45	30	30	30	35			
12	46	25	20	20	20			
12	47	20	20	20	15			
12	48	15	15	15	15			
12	49	15	15	10	10			
12	50	10	10	15	15			
12	51	10	10	10	10			
12	52	10	10	10	10			
12	53	10	10	10	5			
12	54	5	5	5	5			
12	55	10	10	10	10			Steam Plume 75'
12	56	5	5	5	5			Smoke Plume 150'
12	57	5	5	5	5			
12	58	5	5	5	5			

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood W. Va.
TEST NUMBER 3
DATE June 30 '975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Venturi Scrubber

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
13	0	5	10	15	10			Steam Plume = 170'
13	1							Smoke Plume = 130'
13	2							
13	3							
13	4							
13	5							
13	6							
13	7							
13	8							
13	9							
13	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							

C-97

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 3
DATE June 20, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

50% clouds. Wind from North 5-10 MPH

Note → Moved to west side of stack

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached.	COMMENTS
3	0					✓		Test started at 3:0 PM
3	1							1500
3	2							
3	3							
3	4	15	15	15	15			~~1505~~ 1504 hours
3	5	15	15	15	15			
3	6	15	15	15	15			
3	7	15	15	15	15			
3	8	—	—	—	—			Could not read (too windy)
3	9	15	15	15	15			
3	10	15	15	15	15			Steam Plume = 40'
3	11	15	15	15	15			Smoke Plume = 80'
3	12	15	15	15	15			
3	13	15	15	15	15			
3	14	15	15	15	15			
3	15	15	15	15	15			
3	16	15	15	15	15			
3	17	15	15	15	15			
3	18	10	10	10	10			
3	19	10	10	15	15			
3	20	15	15	15	15			
3	21	15	15	15	15			
3	22	15	15	15	15			
3	23	15	15	15	15			
3	24	15	15	15	15			
3	25	15	15	15	15			
3	26	15	15	15	15			
3	27	15	15	15	15			
3	28	15	15	15	15			
3	29							

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va
TEST NUMBER 3
DATE June 20, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
3	30	15	15	15	15	✓		
3	31	10	10	10	10			
3	32	15	15	10	10			
3	33	10	10	10	10			
3	34	10	10	5	5			
3	35	10	10	10	10			
3	36	10	10	10	10			
3	37	10	10	10	15			
3	38	15	15	15	15			
3	39	10	15	15	10			
3	40	15	10	10	10			
3	41	10	10	10	10			
3	42	10	10	10	10			
3	43	10	10	15	15			
3	44	10	15	15	15			Steam Plume = 30'
3	45	10	10	10	10			Smoke Plume = 60'
3	46	10	10	10	10			
3	47	10	10	10	10			
3	48	10	15	15	15			
3	49	15	15	15	15			
3	50	10	10	10	10			
3	51	10	10	10	10			
3	52	10	10	10	10			
3	53	10	10	10	10			
3	54	15	15	10	10			
3	55	10	10	10	10			
3	56	10	10	10	10			
3	57	10	10	10	10			
3	58	10	10	15	15			
3	59	10	10	10	10			

C-99

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Dunwood, W. Va.
TEST NUMBER 3
DATE June 25, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	0	10	15	15	15			
4	1	15	15	15	15			
4	2	15	15	15	15			
4	3	15	15	15	15			
4	4	15	15	10	10			
4	5	10	10	15	15			
4	6	15	15	15	15			
4	7	15	15	10	10			Steam Plume = 30'
4	8	10	10	10	10			Smoke Plume = 60'
4	9	15	15	15	15			
4	10	10	10	10	10			
4	11	10	10	10	10			
4	12	15	15	15	15			
4	13	10	10	10	10			
4	14	10	10	10	10			
4	15	10	10	10	10			
4	16	10	10	10	10			
4	17	15	15	15	20			
4	18	15	15	15	15			
4	19	15	15	15	15			
4	20	15	15	10	10			
4	21	10	10	10	10			
4	22	10	10	10	10			
4	23	10	10	10	10			
4	24	10	10	10	10			
4	25	10	15	15	15			
4	26	15	15	15	15			
4	27	15	15	10	10			
4	28	10	10	10	10			Stopped Reading 16:28
4	29							

C-100

RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 4
DATE June 23, 1975
TYPE FACILITY Coal Cleaning
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION 4
OBSERVER Mason Pilcher
OBSERVER CERTIFICATION DATE May 27, 1975
OBSERVER AFFILIATION Battelle
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT 76'

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME — INITIAL ___:___ a.m. — FINAL ___:___ a.m.
3:30 p.m. (15 30) → 7:30 p.m. (19 30)

OBSERVER LOCATION
Distance to Discharge 450 feet
Direction from Discharge North-west
Height of Observation Point 50 feet
BACKGROUND DESCRIPTION Sky
WEATHER CONDITIONS
Wind Direction None (from N/W per Snyder)
Wind Speed None (0-5 MPH per Snyder)
Ambient Temperature 80°F
SKY CONDITIONS (clear, overcast, % clouds, etc.) 100% clouds - Sprinkling rain
PLUME DESCRIPTION
Color Black
Distance Visible 400 feet
MINUTES OF NONCOMPLIANCE —

C-101

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 2
DATE June 23, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
3	30	35	35	40	35	✓		Started reading
3	31	35	35	40	35			
3	32	35	35	35	35			
3	33	40	40	35	35			
3	34	35	35	40	40			
3	35	35	35	35	35			
3	36	30	30	35	35			
3	37	35	35	40	40			
3	38	40	40	35	35			
3	39	35	35	40	40			
3	40	35	35	35	35			
3	41	40	40	35	35			
3	42	35	35	35	35			Steam Plume = 150'
3	43	30	30	35	35			Black Plume = 200'
3	44	40	40	35	35			
3	45	40	40	35	35			
3	46	30	25	25	30			
3	47	30	30	30	30			
3	48	25	30	30	30			
3	49	25	25	25	25			
3	50	20	20	15	15			
3	51	15	15	15	15			
3	52	15	15	20	20			
3	53	15	15	20	20			
3	54	20	20	15	15			
3	55	15	15	15	15			
3	56	10	10	15	15			
3	57	15	15	15	10			
3	58	10	10	10	10			

OBSERVATION RECORD

COMPANY Westmoreland Gal
LOCATION Quinwood, W. Va.
TEST NUMBER 4
DATE June 23, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Gal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	0	15	15	15	15	✓		Steam Plume = 100'
4	1	15	15	15	15	✓		Smoke Plume = 200'
4	2	15	15	10	10			
4	3	10	10	10	10			
4	4	10	10	10	10			
4	5	10	10	10	10			
4	6	10	10	10	10			
4	7	10	10	10	10			
4	8	10	10	10	10			
4	9	10	10	10	10			
4	10	10	10	10	15			
4	11	10	10	10	10			
4	12	10	10	10	10			
4	13	10	10	10	10			Steam Plume = 150'
4	14	10	10	10	10			Smoke Plume = 350'
4	15	10	10	10	10			
4	16	10	10	10	10			
4	17	10	10	10	10			
4	18	15	15	10	10			
4	19	15	15	15	15			
4	20	15	15	15	15			
4	21	15	15	15	10			
4	22	10	10	15	15			
4	23	15	15	10	10			
4	24	10	10	10	10			
4	25	10	10	10	10			
4	26	15	15	10	10			
4	27	10	10	10	10			
4	28	10	10	10	10			
4	29	10	10	10	10			

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Dunkard, W. Va
TEST NUMBER 4
DATE June 23, 1975

OBSERVER Alan Fisher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

4

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	30	10	10	10	10	✓		
4	31	10	10	10	10	✓		
4	32	10	10	10	10			
4	33	10	10	10	10			
4	34	10	10	10	10			
4	35	10	10	10	10			
4	36	15	15	15	15			
4	37	15	15	15	15			
4	38	10	10	10	10			
4	39	10	10	10	10			
4	40	10	10	10	10			Steam Plume = 150'
4	41	10	10	10	10			Smoke Plume = 250'
4	42	10	10	10	10			
4	43	15	15	15	15			
4	44	10	10	10	10			
4	45	15	15	10	10			
4	46	15	15	10	10			
4	47	10	10	10	10			
4	48	10	10	10	10			
4	49	10	10	10	10			
4	50	10	10	10	10			
4	51	10	10	10	10			
4	52	5	5	5	5			
4	53	5	5	10	10			Steam Plume = 200'
4	54	10	10	10	10			Smoke Plume = 350'
4	55	10	10	10	10			
4	56	10	10	15	15			
4	57	10	10	10	10			
4	58	10	10	10	10			

C-104

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Rivesville, W Va
TEST NUMBER 4
DATE June 23, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached.	COMMENTS
5	0	10	10	10	10	✓		
5	1	10	10	10	10	✓		Steam Plume = 150'
5	2	10	10	10	10			Smoke Plume = 30'
5	3	10	10	10	10			
5	4	15	15	15	15			
5	5	10	10	10	10			
5	6	10	10	10	10			
5	7	10	10	10	10			Begin 4 min
5	8	5	5	5	5			(Sun came out)
5	9	5	5	5	5			
5	10	10	10	10	10			
5	11	10	10	10	10			Very high plume -
5	12	10	10	10	10			going straight up.
5	13	10	10	10	10			Possibly no wind
5	14	10	10	10	10			
5	15	10	10	10	10			
5	16	10	10	10	10			
5	17	10	10	5	5			
5	18	5	5	5	5			
5	19	5	5	5	5			
5	20	5	5	5	5			
5	21	10	10	10	10			
5	22	10	10	10	10			
5	23	10	10	10	10			
5	24	10	10	10	10			
5	25	10	10	10	10			
5	26	10	10	10	10			
5	27	10	10	10	10			
5	28	10	10	10	10			
5	29	10	10	10	10			

C-105
OBSERVATION RECORD
(Cont.)

COMPANY Weirton Steel Co. OBSERVER Mason Dixon Lines
LOCATION Diamond, W. Va. TYPE FACILITY Coal Cleaning
TEST NUMBER 4 POINT OF EMISSIONS Thermal Dryer
DATE June 23, 1975

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
5	30	10	10	10	10			Plume going straight up -
5	31	5	5	5	5			essentially no wind
5	32	5	5	5	5			
5	33	5	5	5	5			Cleaning sky (50% cloudy)
5	34	5	5	5	5			
5	35	5	5	5	5			Steam Plume = 200'
5	36	5	5	5	5			Smoke Plume = 350'
5	37	5	5	5	5			
5	38	5	5	5	5			
5	39	5	5	5	5			
5	40	5	5	5	5			
5	41	10	10	10	10			
5	42	5	5	5	5			
5	43	5	5	5	5			
5	44	10	10	10	10			
5	45	10	10	10	10			
5	46	10	10	10	10			
5	47	10	10	10	10			
5	48	10	10	10	10			
5	49	10	10	10	10			
5	50	10	10	10	10			
5	51	10	10	10	10			
5	52	10	10	10	10			
5	53	10	10	10	10			
5	54	10	10	10	10			
5	55	10	10	10	10			
5	56	10	10	10	10			
5	57	10	10	10	10			
5	58	15	15	15	15			
5	59	15	15	15	15			

C-106

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood W. Va.
TEST NUMBER 4
DATE June 23, 1975

OBSERVER Mason Fisher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
6	0	15	15	15	15			
6	1	15	15	15	15			
6	2	15	15	15	15			
6	3	15	15	15	15			
6	4	10	10	15	15			
6	5	10	10	10	10			25% clouds
6	6	10	10	10	10			
6	7	10	10	10	10			
6	8	10	10	10	10			
6	9	10	10	10	10			
6	10	10	10	10	10			
6	11	10	10	10	10			
6	12	10	10	10	10			Steam Plume = 15'
6	13	10	10	10	10			Smoke Plume = 30'
6	14	10	10	10	10			
6	15	10	10	10	10			
6	16	10	10	10	10			
6	17	10	10	10	10			
6	18	10	10	10	10			
6	19	10	10	10	10			
6	20	10	10	10	10			
6	21	10	10	10	10			
6	22	10	10	10	10			
6	23	10	10	10	10			
6	24	10	10	10	10			
6	25	10	10	10	10			10% clouds
6	26	10	10	10	10			
6	27	10	10	10	10			
6	28	10	10	10	10			
6	29	10	10	10	10			

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Dunwood, W. Va
TEST NUMBER 4
DATE June 22 1975

OBSERVER Mason P.E. Inc
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
6	30	10	10	10	10	✓		
6	31	10	10	10	10	✓		
6	32	10	10	10	10			
6	33	10	10	10	10			
6	34	10	10	10	10			
6	35	10	10	10	10			10% clouds
6	36	10	10	10	10			
6	37	10	10	10	10			Steam Plume = 150'
6	38	10	10	10	10			Smoke Plume = 30'
6	39	10	10	10	10			
6	40	10	10	10	10			
6	41	10	10	10	10			
6	42	10	10	10	10			
6	43	10	10	10	10			
6	44	10	15	15	15			
6	45	15	15	15	15			
6	46	15	15	15	15			
6	47	15	15	15	15			
6	48	15	15	15	15			
6	49	15	15	15	15			
6	50	15	15	15	15			
6	51	15	15	15	15			
6	52	15	15	15	15			
6	53	15	15	15	15			
6	54	15	15	15	15			Steam Plume = 100'
6	55	15	15	15	15			Smoke Plume = 30'
6	56	15	15	15	15			
6	57	15	15	15	15			
6	58	15	15	15	15			
6	59	15	15	15	15			

C-108
OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 2
DATE June 23 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
7	0	15	15	15	15	✓		
7	1	15	15	15	15	✓		Steam Plume = 150'
7	2	15	15	15	15			Smoke Plume = 300'
7	3	15	15	15	15			
7	4	15	15	15	15			
7	5	15	15	15	15			
7	6	15	15	15	15			
7	7	15	15	15	15			
7	8	15	15	15	15			
7	9	15	15	15	15			
7	10	15	15	15	15			Plume obscured by
7	11	15	15	15	15			(Sun about to set)
7	12	15	15	15	15			
7	13	10	10	10	10			
7	14	10	10	10	10			
7	15	10	10	10	10			
7	16	10	10	10	10			
7	17	10	10	10	10			
7	18	10	10	10	10			
7	19	10	10	10	10			
7	20	10	10	10	10			
7	21	10	10	10	10			
7	22	10	10	10	10			Steam Plume = 150'
7	23	10	10	10	10			Smoke Plume = 250'
7	24	10	10	10	10			
7	25	10	10	10	10			
7	26	15	15	15	15			
7	27	15	15	15	15			
7	28	15	15	15	15			
7	29	15	15	15	15			Sunset - Stopped Reading

RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal
LOCATION Quinwood W. Va.
TEST NUMBER 5
DATE June 25 1975
TYPE FACILITY Coal Cleaning
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION 7
OBSERVER Mason Pilcher
OBSERVER CERTIFICATION DATE May 27, 1975
OBSERVER AFFILIATION Battelle
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT 76 feet

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME INITIAL 10:04 a.m. FINAL ___:___ a.m.
___:___ p.m. 5:15 p.m.

5 A 1004 → 1400
5 B 1430 → 1715

OBSERVER LOCATION
Distance to Discharge 100' (400' after moving at 1:10)
Direction from Discharge South East (moved to NW at 1:10)
Height of Observation Point 50 above base of stack

BACKGROUND DESCRIPTION Sky (slightly hazey)

WEATHER CONDITIONS
Wind Direction Very little wind most of test
Wind Speed None (most of the time)
Ambient Temperature 80°F

SKY CONDITIONS (clear, overcast, % clouds, etc.) Slightly overcast

PLUME DESCRIPTION
Color Black
Distance Visible About 400 feet

MINUTES OF NONCOMPLIANCE —

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OBSERVATION RECORD

COMPANY Westmoreland Coal

LOCATION Quinwood, W. Va

TEST NUMBER 5

DATE June 25, 1975

OBSERVER [illegible]

TYPE FACILITY Coal Cleaning

POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
10	0					No steam plume		
10	1							
10	2							
10	3							
10	4	20	20	15	15			Started reading
10	5	15	15	15	15			
10	6	15	15	15	15			
10	7	15	15	15	15			
10	8	15	15	15	15			
10	9	15	15	15	15			
10	10	15	15	15	15			
10	11	15	15	15	15			No steam plume
10	12	15	15	15	15			
10	13	15	15	15	15			
10	14	15	15	15	15			
10	15	15	15	15	15			
10	16	20	20	20	20			
10	17	20	20	20	20			
10	18	20	20	20	20			
10	19	25	25	25	25			
10	20	25	25	25	25			
10	21	25	25	25	25			
10	22	25						Stopped Reading
10	23							
10	24							
10	25							
10	26							
10	27							
10	28							
10	29							

C-111
OBSERVATION RECORD

COMPANY Weirton Steel Co.
LOCATION Weirton, W. Va.
TEST NUMBER 5
DATE June 25, 1975

OBSERVER [illegible]
TYPE FACILITY Coal Charging
POINT OF EMISSIONS Thermal Tower

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
11	0	15	15	15	15	✓		Started process
11	1	15	15	15	15	✓		Steam plume = 50'
11	2	10	10	10	10			Smoke plume = 200'
11	3	10	10	10	10			
11	4	15	15	15	15			Inlet sample inserted
11	5	10	10	10	10			" " removed
11	6	15	15	15	15			
11	7	15	15	15	15			
11	8	10	10	10	10			
11	9	10	10	10	10			
11	10	10	10	10	10			
11	11	10	10	10	10			
11	12	10	10	10	10			
11	13	10	10	10	10			
11	14	10	10	10	10			
11	15	15	15	10	10			
11	16	10	10	10	10			
11	17	10	10	10	10			
11	18	15	15	15	15			Steam Plume = 100'
11	19	10	10	10	10			Smoke Plume = 250'
11	20	10	10	10	10			
11	21	15	15	15	15			Blo. Stk. (clearing)
11	22	15	15	15	15			
11	23	15	15	15	15			
11	24	15	15	15	15			
11	25	15	15	15	15			
11	26	15	15	15	15			
11	27	15	15	15	15			
11	28	15	15	15	15			
11	29	15	15	15	15			

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Dawmont W. Va.
TEST NUMBER 5
DATE June 25 1975

OBSERVER Mason Fisher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
11	30	20	20	20	20	✓		
11	31	15	15	15	15	✓		
11	32	15	15	15	15			Reduced water vapor
11	33	15	15	15	15			
11	34	15	15	15	15			
11	35	20	20	20	20			
11	36	15	15	15	15			
11	37	20	20	20	20			
11	38	20	20	20	20			
11	39	20	20	20	20			
11	40	20	20	20	20			
11	41	25	25	25	25			
11	42	25	25	25	25			
11	43	20	20	20	20			
11	44	20	20	20	20			Steam plume = 50'
11	45	20	20	20	20			Smoke plume = 20'
11	46	20	20	20	20			
11	47	20	20	20	20			
11	48	15	15	15	15			Wind = 10 MPH
11	49	20	20	20	20			10% cloud
11	50	20	20	20	20			
11	51	20	20	20	20			
11	52	15	15	15	15			
11	53	20	20	20	20			
11	54	15	15	15	15			
11	55	15	15	15	15			
11	56	15	15	15	15			
11	57	20	20	20	20			No steam plume
11	58	5	5	30	30			
11	59	25	25	20	20			

C-113
OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Dunmore, W Va.
TEST NUMBER 5
DATE Jan. 25, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached.	COMMENTS
12	0	25	25	25	25	✓		Slight Lazy Sky
12	1	25	25	25	25	✓		
12	2	20	20	15	15			
12	3	20	20	15	15			
12	4	15	15	15	15			Stopped running Sewell No. 7
12	5	15	15	15	15			
12	6	20	20	20	20			
12	7	20	15	15	15			
12	8	20	20	25	25			
12	9	20	20	15	15			
12	10	20	20	20	20			
12	11	20	20	20	20			
12	12	20	20	20	20			
12	13	20	20	20	20			
12	14	15	15	15	15			Steam Plume = 150'
12	15	15	15	15	15			Smoke Plume = 250'
12	16	15	15	15	15			
12	17	15	15	15	15			
12	18	20	20	20	20			
12	19	20	20	20	20			
12	20	15	15	15	15			
12	21	20	20	20	20			
12	22	15	15	15	15			Smoke dissipated
12	23	15	15	15	15			
12	24	15	15	15	15			
12	25	20	20	20	20			
12	26	25	25	20	20			
12	27	20	20	20	20			
12	28	20	20	20	20			
12	29	25	25	25	25			

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Quinwood W Va.
TEST NUMBER 5
DATE Jun. 25, 1975

OBSERVER Mason Richey
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
12	30	25	20	20	15	✓		
12	31	15	15	10	10	✓		
12	32	10	10	15	15			
12	33	10	10	15	15			
12	34	15	10	10	10			
12	35	10	10	15	10			Light Steam Plume
12	36	15	15	15	15			
12	37	15	15	20	15			
12	38	15	15	15	15			
12	39	15	15	15	20			
12	40	20	20	25	20			
12	41	20	30	20	25			
12	42	20	20	20	20			
12	43	20	20	20	25			Stm Plume - 10'
12	44	25	25	20	20			Smoke Plume - 200'
12	45	20	20	20	20			
12	46	25	25	25	25			
12	47	25	25	25	25			
12	48	25	35	30	30			
12	49	30	30	25	25			
12	50	25	25	20	20	✓START		
12	51	20	20	20	25	✓		
12	52	25	25	20	20	✓ MISSING		
12	53	20	20	20	20	✓		
12	54	20	20	20	20	✓		
12	55	20	15	15	15	✓		
12	56	15	15	20	20	✓		
12	57	25	25	25	25	✓		
12	58	20	20	20	20	✓		
12	59	20	25	25	25	✓		

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OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 5
DATE June 25 1975

OBSERVER Mason Dicker
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1	0	25	25	25	25	✓		
1	1	25	25	25	25	✓		
1	2	25	25	25	25			Steam plume = 10'
1	3	25	25	25	25			Smoke plume = 20'
1	4	20	20	20	20			
1	5	25	25	30	30			10% clouds
1	6	25	25	25	20			
1	7	20	15	20	20			
1	8	25	25	20	20			
1	9	25	25	25	25			
1	10	25	25	25	25			
1	11							Moved from south east
1	12							to northwest of stack
1	13							
1	14							
1	15							
1	16							
1	17							
1	18							
1	19							
1	20							
1	21							
1	22							
1	23							
1	24							
1	25							
1	26							
1	27	15	15	15	15			
1	28	15	15	15	15			
1	29	20	20	20	20			

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Quinwood W. Va.
TEST NUMBER 5
DATE June 25, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1	30	20	25	25	25	✓		
1	31	25	25	25	25	✓		
1	32	25	25	20	20			
1	33	20	25	25	25			Steam plume = 150'
1	34	25	20	20	20			Smoke plume = 253'
1	35	20	20	20	20			
1	36	15	15	20	20			
1	37	15	15	15	15			
1	38	15	15	15	15			
1	39	15	15	15	15			
1	40	15	15	15	15			
1	41	15	15	15	15			
1	42	15	15	15	15			
1	43	15	15	15	15			
1	44	15	15	15	15			
1	45	15	15	15	15			
1	46	15	15	15	15			
1	47	15	15	15	15			
1	48	20	20	20	20			
1	49	20	20	20	20			
1	50	20	20	20	20			
1	51	20	20	20	20			
1	52	20	20	20	20			
1	53	20	20	20	20			
1	54	20	20	20	20			
1	55	20	20	20	20			
1	56	20	20	20	20			
1	57	20	20	20	20			
1	58	20	20	20	20			
1	59	20	20	20	20			Stopped reading 1 hour

C-117
OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Quinwood W. Va.
TEST NUMBER 5
DATE June 25, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
2	30	25	25	25	25			Started reading again
2	31	25	25	25	25			(after 30-minute break)
2	32	30	30	30	30			
2	33	35	35	30	30			Steam plume = 150'
2	34	30	35	35	35			Smoke plume = 300'
2	35	30	30	30	30			
2	36	30	30	30	30			
2	37	35	35	35	35			
2	38	35	35	35	35			
2	39	35	40	40	40			
2	40	40	40	40	40			
2	41	40	40	40	40			
2	42	40	40	40	40			Stopped reading for
	43							1 hour and 2 minutes
	44							
3	45	10	10	10	10			Started reading again
3	46	10	10	10	10			
3	47	15	15	10	10			Steam plume = 150'
3	48	10	10	10	10			Smoke plume = 300'
3	49	10	10	10	10			(Almost no wind)
3	50	10	10	10	10			
3	51	10	10	10	10			
3	52	15	15	15	10			
3	53	10	10	10	10			
3	54	15	10	10	10			
3	55	10	10	10	10			
3	56	10	10	10	10			
3	57	10	15	10	10			
3	58	10	10	10	10			
3	59	10	15	15	10			

C-118

OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 5
DATE June 25, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	0	10	10	10	10			
4	1	10	10	10	10			Steam plume = 150'
4	2	10	15	15	10			Smoke plume = 300'
4	3	10	10	10	10			(Essentially no wind)
4	4	10	10	10	10			
4	5	10	10	10	10			
4	6	15	15	15	15			
4	7	10	10	10	15			
4	8	10	10	10	10			
4	9	10	10	10	10			
4	10	10	10	10	10			
4	11	10	10	10	10			
4	12	10	10	10	10			
4	13	10	10	10	10			
4	14	15	10	10	10			
4	15	10	10	10	10			
4	16	10	10	10	10			Steam plume = 150'
4	17	10	10	10	10			Smoke plume = 200'
4	18	10	10	10	10			
4	19	10	10	10	10			
4	20	10	10	10	10			
4	21	10	10	10	10			
4	22	10	10	10	10			
4	23	10	15	15	10			
4	24	15	15	15	15			
4	25	10	15	10	10			
4	26	10	10	10	10			Steam plume = 150'
4	27	10	15	10	10			Smoke plume = 300'
4	28	15	10	10	10			
4	29	10	10	10	10			

C-119
OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 5
DATE June 25, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	30	10	15	10	10			
4	31	10	15	15	10			
4	32	10	10	10	10			
4	33	10	10	10	10			
4	34	15	15	15	15			
4	35	15	15	10	10			
4	36	10	10	10	10			
4	37	10	10	10	10			
4	38	15	15	10	10			
4	39	10	10	15	15			Steam plume = 75'
4	40	10	10	10	10			Smoke plume = 300'
4	41	10	10	10	10			
4	42	10	10	15	15			Hazy
4	43	15	15	10	10			
4	44	10	10	15	15			
4	45	15	15	10	10			
4	46	10	10	10	10			
4	47	10	10	10	10			
4	48	10	10	15	15			
4	49	10	10	10	10			
4	50	10	10	10	10			
4	51	10	10	10	10			
4	52	10	10	15	15			
4	53	15	10	10	10			
4	54	10	10	10	10			
4	55	15	15	15	15			Steam disappeared
4	56	15	15	15	15			
4	57	15	15	15	15			
4	58	15	15	15	15			
4	59	15	15	15	15			

C-120
OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood, W. Va.
TEST NUMBER 5
DATE June 25, 1975

OBSERVER Mason Pilcher
TYPE FACILITY Coal Cleaning
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached.	COMMENTS
5	0	15	15	15	15			Practically no steam
5	1	15	15	15	15			
5	2	20	20	15	15			Steam plume - missing
5	3	15	15	20	20			Smoke plume = 200'
5	4	15	15	15	15			
5	5	15	15	15	15			
5	6	20	20	15	15			
5	7	15	15	20	20			
5	8	20	20	20	20			Smoke goes straight
5	9	20	20	20	20			up for about 300'
5	10	20	20	20	20			
5	11	20	20	20	20			
5	12	25	25	30	30			
5	13	25	25	20	20			
5	14	20	20	15	15			
5	15	20	20					Finished reading at 5:15
	16							1715 hours
	17							
	18					Note:	Apparently	cards were sent to the
	19						computer	covering only the time
	20						from	1120 to 1609 hours.
	21							(plus 5 minutes)
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							

I

C-121

RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va
TEST NUMBER 1
DATE 6/19/75
TYPE FACILITY Coal Cleaning Plant
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION 51 min
OBSERVER Ron Souder
OBSERVER CERTIFICATION DATE April 75
OBSERVER AFFILIATION Battelle Columbus Labs.
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT 76 ft

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME	INITIAL ___:___ a.m.	FINAL ___:___ a.m.
	6:09 p.m.	6:59 p.m.

OBSERVER LOCATION
- Distance to Discharge 400 ft
- Direction from Discharge N. West of Stack
- Height of Observation Point 50 ft

BACKGROUND DESCRIPTION Sky

WEATHER CONDITIONS
- Wind Direction North North-West
- Wind Speed 0-5 mph
- Ambient Temperature 75°F

SKY CONDITIONS (clear, overcast, % clouds, etc.) 20% scattered clouds

PLUME DESCRIPTION
- Color Black-Brown; Smoke - water - no plume present
- Distance Visible 100-300 ft

MINUTES OF NONCOMPLIANCE —

C-122

OBSERVATION RECORD

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 1
DATE 6/18/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	0							wind Direction varied throughout
	1							the run - water Plume height
	2							varied also.
	3							
	4							
	5							
	6							
	7							
	8							
6	9	20	20	20	20	✓		6:09 pm - water plume height 50 ft
	10	20	25	20	20	✓		
	11	20	20	20	20	✓		
	12	20	20	25	25	✓		
	13	20	15	20	20	✓		
	14	20	20	15	20	✓		
	15	25	20	20	20	✓		water plume - 120 ft - black plume
	16	15	20	20	20	✓		extends up 250 ft
	17	15	15	15	15	✓		
	18	15	15	15	15	✓		
	19	15	15	15	10	✓		
	20	15	20	20	20	✓		water plume 75 ft
	21	25	25	25	-	✓		water plume 50 ft
	22	-	25	30	30	✓		wind shifted - out of west
	23	20	20	20	25	✓		
	24	25	20	15	15	✓		no wind - water plume - 150 ft
	25	10	10	15	10	✓		5 mph wind - S/west
	26	10	15	10	15	200 ft		
	27	15	15	15	10	175 ft		
	28	15	10	15	10	150 ft		
	29	10	20	20	15	100 ft		

C-123

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va
TEST NUMBER 1
DATE 6/18/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Co.
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1	30	15	15	20	25	100 ft		18:30 hours
	31	15	15	15	15	150 ft		
	32	15	15	15	15	150 ft		
	33	15	10	10	10	175 ft		
	34	10	15	20	15	150 ft		North wind - 5 m.p.h
	35	25	20	15	15	100 ft		
	36	20	20	20	20	150 ft		
	37	20	15	15	15	100 ft		
	38	15	15	15	15	150 ft		
	39	20	15	15	20	150 ft		
	40	15	15	10	15	150 ft		
	41	15	15	15	15	75 ft		
	42	15	15	10	10	50 ft		
	43	15	10	5	5	50 ft		
	44	10	10	15	10	50 ft		
	45	10	10	15	10	50 ft		Water plume very thin
	46	15	15	15	15	50 ft		"
	47	15	15	15	15	50 ft		"
	48	15	15	15	15	10 ft		
	49	20	20	15	15	100 ft		Water plume gone for 5 sec.
	50	15	15	15	10	100 ft		very erratic
	51	10	10	10	10	100 ft		
	52	5	10	5	5	50 ft		
	53	5	10	5	5	50 ft		very thin water plume
	54	5	5	5	10	75 ft		"
	55	10	15	10	10	50 ft		18:55 hours
	56	10	15	10	15	75 ft		
	57	15	15	15	10	50 ft		
	58	10	10	15	10	75 ft		
	59	10	10	15	10	100 ft		

II

C-124

RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 2
DATE 6/19/75
TYPE FACILITY Coal Cleaning Plant
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION 3 hrs
OBSERVER Paul Snyder
OBSERVER CERTIFICATION DATE April '75
OBSERVER AFFILIATION Battelle Columbus Lab
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT 76 ft

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME	INITIAL	FINAL
	3 :10 p.m.	6 :50 p.m.

OBSERVER LOCATION
- Distance to Discharge 400 ft
- Direction from Discharge N.West of stack
- Height of Observation Point 50 ft

BACKGROUND DESCRIPTION Sky

WEATHER CONDITIONS
- Wind Direction S/W.
- Wind Speed 5-10 mph
- Ambient Temperature 80 °F

SKY CONDITIONS (clear, overcast, % clouds, etc.) 50 % Clouds

PLUME DESCRIPTION
- Color Black-Brown Water Vapor plume present
- Distance Visible 1-300 ft

MINUTES OF NONCOMPLIANCE

C-125

OBSERVATION RECORD

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va.
TEST NUMBER 2
DATE 6/19/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
3	10	20	15	15	15	75 lt		3:10 PM
	11	25	15	20	15	50 lt		
	12	20	20	20	20	50 Lt		Wind speed 5-10 mph - shifting
	13	25	25	20	20	50 lt		directions continually - from
	14	20	20	15	15	75 Lt		west - north and east
	15	20	15	15	10	75 lt		
	16	10	15	10	10	75 lt		
	17	10	15	[illegible]	10	100 lt		
	18	10	-	-	15	50 Lt		- plume interference can't
	19	20	15	10	15	75 lt		not obtain a reading
	20	15	15	15	20	75 Lt		
	21	15	20	20	15	75 Lt		
	22	25	25	20	25	75 Lt		
	23	20	15	15	15	75 lt		
	24	15	10	15	15	75 lt		
	25	15	20	20	20	50 Lt		
	26	20	20	20	15	50 Lt		
	27	15	20	20	20	50 Lt		
	28	15	20	20	15	75 Lt		
	29	20	20	30	20			← very little water vapor plume
	30	30	35	35	30			← present in exhaust
	31	35	35	35	30			← NO water vapor plume
	32	30	30	30	35			— ↓
	33	30	30	30	25	30 lt		
	34	20	20	20	20	30 lt		
	35	20	15	20	15	50 lt		
	36	15	20	20	20	50 lt		
	37	20	20	30	35			← very little water vapor
	38	20	30	30	15	50 lt		present in exhaust
	39	20	20	15	15	75 lt		

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co. OBSERVER Ron Snyder

LOCATION Quinwood W. Va TYPE FACILITY Coal Cleaning Plant

TEST NUMBER 1 POINT OF EMISSIONS Thermal Dryer

DATE 6/19/25

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
3	40	15	15	10	20	75 lt		
	41	15	20	20	20	75 lt		
	42	20	20	20	20	75 lt		
	43	20	15	20	20	50 lt		
	44	20	15	20	20	50 lt		
	45	25	30	35	35	✓		- water vapor present
	46	35	35	35	35	✓		in small quantity
	47	32	32	35	35	✓		
	48	35	35	35	30	25 lt		water vapor plume (very
	49	30	25	25	25	25 lt		little vapor present)
	50	25	20	20	20	50 lt		
	51	25	25	20	25	50 lt		
	52	25	20	20	25	50 lt		
	53	25	25	25	25	50 lt		
	54	25	25	25	25	50 lt		
	55	25	25	25	30			NO vapor present
	56	30	30	30	30			
	57	35	40	45	45			
	58	45	45	40	40			
	59	40	40	40	45			
4	00	40	35	35	35			
	01	35	35	30	30	50 lt		small amounts of water
	02	20	15	20	15	75 lt		vapor present
	03	25	25	25	35			NO vapor present
	04	35	35	35	35			
	05	35	35	35	35			
	06	35	40	35	40			- Small amounts of water vapor
	07	40	45	45	45			- present in plume
	08	40	*40	35	30			*Water vapor plume 50 lt
	09	30	30	30	**	50 lt		** NO VAPOR

C-127

OBSERVATION RECORD

COMPANY Westmoreland Coal Co.
LOCATION Burnwood W. Va
TEST NUMBER 2
DATE 6/19/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	10	35	35	35	30			NO Vapor
	11	30	30	35	35			↓
	12	35	35	30	30			
	13	35	35	35	35			small amounts of vapor in exhaust plume
	14	30	30	30	30	25 Lt		
	15	30	30	25	20	50 Lt		water vapor plume present
	16	20	20	20	20	50 Lt		
	17	25	25	25	25	50 Lt		very little vapor present
	18	25	25	25	25	50 Lt		↓
	19	30	25	25	25	50 Lt		
	20	25	25	20	20	75 Lt		normal plume
	21	20	20	20	20	75 Lt		
	22	25	20	20	20	50 Lt		
	23	25	25	25	25	50 Lt		
	24	25	25	25	25	50 Lt		
	25	25	20	25	25	50 Lt		
	26	25	25	25	25	50 Lt		
	27	20	20	20	20	75 Lt		
	28	20	20	15	15	75 Lt		
	29	15	X 25	20	X 25			X No water vapor
	30	20	25	25	25			water vapor very
	31	25	25	X 25	25			evident
	32	30	30	30	30			NO Vapor
	33	30	30	30	30			
	34	30	30	35	30			
	35	30	30	25	25			
	36	30	30	25	30			
	37	25	30	30	35			
	38	30	30	30	25			
	39	30	35	30	30			

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co. OBSERVER Jim Snyder
LOCATION Quinnwood W Va TYPE FACILITY Coal Cleaning Plant
TEST NUMBER 2 POINT OF EMISSIONS Thermal Dryer
DATE 6/19/75

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	40	30	30	30	20			
	41	30	30	*30	20			* water vapor present (in small amounts)
	42	30	30	25	30	25 Lt		
	43	25	25	25	20	50 Lt		
	44	20	20	10	10	75 Lt		
	45	10	15	10	10	75 Lt		
	46	15	15	15	15	75 Lt		
	47	15	15	15	15	50 Lt		
	48	15	15	15	15	50 Lt		
	49	10	15	10	—	75 Lt		wind interference
	50	20	15	—	15	50 Lt		
	51	15	15	15	15	75 Lt		
	52	15	10	10	10	75 Lt		
	53	15	15	15	10	75 Lt		
	54	10	10	15	15	75 Lt		
	55	15	15	15	15	75 Lt		
	56	15	15	15	20	75 Lt		
	57	15	15	20	20	50 Lt		
	58	15	15	15	15	50 Lt		
	59	10	10	15	15	75 Lt		
5	00	*20	20	25	30			* Very little vapor, no vapor
	01	35	30	30	30			no vapor
	02	30	35	25	35			
	03	35	35	30	35			Small amounts of vapor present
	04	35	30	35	35			
	05	30	30	35	30			none
5	06	25	25	25	30			
	07	30	30	30	30			
	08	35	35	30	35			
	09	40	40	35	35			

C-129

OBSERVATION RECORD

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va
TEST NUMBER
DATE

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
5	10	35	30	30	30			No vapor
	11	25	30	30	30			
	12	30	30	30	30			
	13	30	30	30	30			
	14	35	30	35	35			
	15	35	35	35	30			
	16	30	30	*30	35			*Water Vapor present (25 ft)
	17	20	20	20	15			
	18	20	25	25	25			
	19	25	20	15	25			very little
	20	20	25	30	30	30 ft		
	21	30	30	25	30	25 ft		
	22	30	25	–	30	25 ft		wind [illegible]
	23	30	–	–	25	25 ft		
	24	25	25	20	25	25 ft		
	25	25	25	25	20	25 ft		
	26	30	20	20	25	50 ft		
	27	25	25	25	25	50 ft		
	28	25	25	25	25	50 ft		
	29	25	25	30	30	50 ft		
	30	30	25	25	25	50 ft		
	31	30	30	–	–	50 ft		
	32	30	25	25	25	50 ft		
	33	25	25	20	25	50 ft		
	34	30	20	25	20	50 ft		
	35	20	20	20	25	50 ft		
	36	20	20	20	15	50 ft		
	37	20	10	15	15	75 ft		
	38	10	15	15	15	75 ft		
	39	15	10	15	15	75 ft		

C-130

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co. OBSERVER P. Snyder

LOCATION Quinwood W. Va. TYPE FACILITY Coal Cleaning Plant

TEST NUMBER 2 POINT OF EMISSIONS Thermal Dryer

DATE

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
5	40	15	20	20	20	75 Lt		
	41	15	15	10	15	100 Lt		
	42	15	15	15	10	100 Lt		
	43	10	10	10	10	100 Lt		
	44	10	10	15	–	50 Lt		- wind interference
	45	–	15	15	15	100 Lt		
	46	10	15	15	10	75 Lt		* water plume at 50 Lt high
	47	20	20	20	15	50 Lt		
	48	15	–	20	20	50 Lt		
	49	15	–	–	20	50 Lt		
	50	20	15	20	20	50 Lt		
	51	20	25	25	25	50 Lt		
	52	25	25	20	25	50 Lt		
	53	20	20	20	15	75 Lt		
	54	15	25	20	–	75 Lt		
	55	20	20	25	20	50 Lt		
	56	20	25	25	20	50 Lt		
	57	20	20	20	20	50 Lt		
	58	25	20	15	15	50 Lt		* No water plume
	59	20	20	15	15	75 Lt		
6	00	10	15	10	10	75 Lt		
	01							
	02							
	03							
	04						1811	
	05							
	06						1809	
	07							
	08							
	09							

C-131
OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 2
DATE 6/19/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	30							
	31							
	32							
	33							
	34							
	35							
	36							
	37							
	38							
	39							
	40							
	41							
	42							
6	43	20	20	20	10	50 ft		
	44	15	20	15	*5	50 ft		*almost no water vapor
	45	*5	*5	30	30	25 ft		
	46	20	20	20	20	50 ft		
	47	20	20	15	20	50 ft		
	48	20	25	20	20	50 ft		
	49	–	20	20	25	75 ft		
	50	25	25	25	30			NO vapor
	51	25	25	55				
	52							
	53							
	54							
	55							
	56							
	57							
	58							
	59							

III

C-132

RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va.
TEST NUMBER 3
DATE 6/20/75
TYPE FACILITY Coal Cleaning Plant
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION 3 hrs. 21 min
OBSERVER Ron Snider
OBSERVER CERTIFICATION DATE April '75
OBSERVER AFFILIATION Battelle Columbus Lab
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT 76 ft

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME

INITIAL 9:39 a.m.
__:__ p.m.

FINAL __:__ a.m.
12:59 p.m.

OBSERVER LOCATION
Distance to Discharge 150 ft
Direction from Discharge S.E. of Stack
Height of Observation Point 40 ft
BACKGROUND DESCRIPTION Sky (clouds)
WEATHER CONDITIONS
Wind Direction North east
Wind Speed 0-5 mph -
Ambient Temperature 70 °F
SKY CONDITIONS (clear, overcast, % clouds, etc.) 100 % overcast
PLUME DESCRIPTION
Color Black-Brown
Distance Visible 1-300 ft
MINUTES OF NONCOMPLIANCE

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co
LOCATION Quinwood W.Va
TEST NUMBER 3
DATE 6/20/75

OBSERVER Ron Snider
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	30							
	31							
	32							
	33							
	34							
	35							
	36							
	37							
	38							
9	39 AM	20	25	20	25	250 ft		250 ft plume
	40	25	20	20	15	250 ft		
	41	20	20	20	25	200 ft		
	42	15	15	20	20	175 ft		250 ft plume
	43	20	15	20	25	200 FT		
	44	25	20	20	20	200 ft		
	45	20	20	25	25	175 ft		250 ft plume
	46	20	20	20	20	175 ft		
	47	20	20	20	20	150 ft		250 ft plume
	48	25	20	25	25	200 ft		
	49	25	20	25	20	200 ft		250 ft plume
	50	25	25	20	20	225 ft		
	51	20	20	20	20	200 ft		
	52	20	20	20	20	250 ft		300 ft plume
	53	20	20	20	20	150 ft		
	54	25	20	15	25	150 ft		
	55	20	25	20	25	200 ft		
	56	25	20	20	20	200 ft		
	57	20	25	25	20	250 ft		300 ft plume
	58	25	20	25	20	150 ft		
	59	20	20	25	20	175 ft		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 3
DATE 6/20/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning plant
POINT OF EMISSIONS thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	0	15	15	15	20	150 ft		300 ft visible
10	1	20	15	15	20	150 ft		(Down)
	2	20	20	15	20	175 ft		
	3	15	15	15	5	150 ft		
	4	10	15	20	15	175 ft		
	5	15	20	15	15	175 ft		
	6	5	10	10	15	150 ft		300 ft plume
	7	15	15	20	15	150 ft		
	8	20	15	15	15	150 ft		
	9	15	15	20	15	175 ft		
	10	15	20	15	15	150 ft		
	11	20	20	15	10	250 ft		300 ft plume
	12	15	10	10	10	250 ft		
	13	15	20	15	10	200 ft		
	14	10	10	15	15	200 ft		
	15	15	15	15	20	200 ft		
	16	20	15	15	15	200 ft		
	17	10	20	20	15	200 ft		300 ft plume
	18	20	20	20	15	175 ft		
	19	15	15	15	15	150 ft		- wind interference
	20	15	15	-	-	150 ft		
	21	15	15	15	15	150 ft		
	22	15	20	15	20	200 ft		
	23	20	20	20	20	150 ft		
	24	20	20	15	15	125 ft		300 ft plume
10	25	15	15	20	20	175 ft		
	26	15	15	20	15	125 ft		
	27	15	25	25	20	100 ft		
	28	30	30	20	25	100 ft		
	29	25	20	15	20	175 ft		

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co
LOCATION Quinwood W Va
TEST NUMBER 3
DATE 6/20/75

OBSERVER Ron Smiles
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
10	30	20	-	20	15	175 ft		
	31	15	20	20	20	150 ft		
	32	20	15	15	20	175 ft		
	33	20	20	-	20	175 ft		
	34	20	20	-	-	150 ft		
	35	15	20	15	20	150 ft		
	36	15	20	20	20	250 ft		
	37	-	15	15	15	200 ft		300 ft plume
	38	20	15	20	15	200 ft		
	39	15	20	15	-	250 ft		
	40	15	15	20	15	200 ft		↓ Note by P. Webb Pilcher Not reading
	41	20	-	-	-	250 ft		
	42	20	10	15	20	200 ft		300 ft plume
	43	20	20	20	20	175 ft		
	44	15	15	15	15	150 ft		
10	45	15	20	20	15	200 ft		
	46	25	25	20	25	175 ft		
	47	-	25	25	-	150 ft		
	48	20	20	-	-	150 ft		
	49	20	20	20	20	150 ft		
	50	20	15	15	15	175 ft		
	51	20	15	15	15	100 ft		300 ft plume
	52	15	20	-	-	225 ft		
	53	15	-	20	25	200 ft		
	54	20	-	20	-	200 ft		
	55	-	-	20	20	200 ft		
	56	25	20	25	25	200 ft		
	57	20	25	25	25	200 ft		
	58	20	20	15	20	250 ft		
	59	25	25	25	20	200 ft		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co
LOCATION Quinnwood W. Va
TEST NUMBER 3
DATE 6/20/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
11	0	20	20	20	20	200 ft		start up
	1	20	20	20	15	200 ft		
	2	15	20	15	15	200 ft		
	3	20	20	20	15	200 ft		
	4	20	20	20	20	200 ft		300 ft plume
	5	25	25	20	20	200 ft		
	6	15	20	20	15	200 ft		
	7	15	15	20	20	250 ft		
	8	20	15	20	20	250 ft		
	9	25	25	15	15	200 ft		
	10	20	20	20	20	200 ft		
	11	20	25	25	25	200 ft		
	12	30	25	25	25	200 ft		
	13	25	25	20	25	200 ft		350 ft plume
	14	20	20	15	20	200 ft		
	15	15	20	15	—	200 ft		
	16	20	25	15	20	225 ft		
	17	20	20	20	30	200 ft		
	18	25	20	25	25	200 ft		300 ft plume
	19	20	20	25	20	225 ft		
	20	25	15	15	20	225 ft		
	21	25	25	15	20	175 ft		
	22	20	25	15	20	200 ft		
	23	15	25	20	20	200 ft		
	24	20	25	20	20	200 ft		
	25	20	25	30	25	200 ft		
	26	25	25	25	25	200 ft		300 ft plume
	27	20	15	15	20	200 ft		
	28	15	15	20	20	200 ft		
	29	15	20	20	15	200 ft		

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 3
DATE 6/20/75

OBSERVER Jon. Snider
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	30	20	20	25	30	250 ft		
	31	35	30	25	20	200 ft		
	32	30	30	25	25	300 ft		
	33	35	35	25	20	200 ft		
	34	25	25	25	20	200 ft		
	35	15	15	15	25	150 ft		250 ft plume
	36	—	20	20	25	200 ft		
	37	25	25	25	25	200 ft		
	38	25	25	—	—	200 ft		
	39	—	25	20	20	200 ft		300 ft plume
	40	15	20	25	15	200 ft		
	41	20	20	25	25	200 ft		
	42	25	30	25	25	200 ft		
	43	20	25	25	20	250 ft		
	44	—	—	—	20	200 ft		
	45	—	25	25	—	250 ft		
	46	25	25	25	25	200 ft		
	47	25	25	25	25	200 ft		
	48	25	25	—	25	200 ft		
	49	30	25	25	25	150 ft		
	50	25	30	25	25	150 ft		250 ft plume
	51	25	25	25	25	200 ft		
	52	25	25	25	20	200 ft		300 ft plume
	53	25	30	25	25	200 ft		
	54	25	25	20	20	200 ft		250 ft
	55	25	20	25	20	200 ft		
	56	25	25	20	20	200 ft		300 ft plume
	57	25	25	30	30	175 ft		
	58	25	25	—	20	150 ft		
	59	25	30	25	25	150 ft		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co
OBSERVER R. Snider
LOCATION Quinwood W. Va.
TYPE FACILITY Coal Cleaning Plant
TEST NUMBER 3
POINT OF EMISSIONS Thermal Dryer
DATE 6/20/75

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	0	25	25	30	30	150 ft A		
12	1	25	25	25	20	200 ft A		
	2	25	20	25	20	200 ft		
	3	20	25	20	25	200 ft		Start up
	4	25	25	25	25	200 ft		
	5	25	20	25	25	200 ft		
	6	25	25	20	25	200 ft		
	7	20	25	25	25	200 ft		
	8	20	20	25	20	200 ft		
	9	20	20	20	20	200 ft		
	10	20	25	25	25	200 ft		300 ft plume
	11	20	20	20	25	200 ft		
	12	20	20	25	25	200 ft		
	13	20	15	15	20	200 ft		
	14	25	25	25	30	200 ft		
	15	30	25	25	—	200 ft		
	16	25	30	—	—	200 ft		
	17	—	—	—	—			
	18	25	25	20	20	200 ft		
	19	20	20	20	20	200 ft		
	20	20	—	—	25	200 ft		
	21	25	30	25	20	200 ft		
	22	20	25	25	30	200 ft		
	23	25	20	25	20	200 ft		200 ft plume
	24	25	25	25	25	200 ft		
12	25	20	—	—	—	200 ft		
	26	—	25	25	—	200 ft		
	27	—	—	—	25	200 ft		
	28	20	20	20	20	200 ft		
	29	20	20	25	20	200 ft		

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co. OBSERVER R. Smith

LOCATION Quinwood W. Va. TYPE FACILITY Coal Cleaning Plant

TEST NUMBER 3 POINT OF EMISSIONS Thermal Dryer

DATE 6/20/75

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
12	30	15	20	25	20	175 ft		
	31	20	20	20	20	200 ft		
	32	20	15	20	25	200 ft		
	33	—	20	—	20	200 ft		
	34	—	—	25	—	200 ft		
	35	20	20	20	20	200 ft		
	36	15	20	20	20	200 ft		
	37	20	20	20	25	200 ft		250 ft plume
	38	20	20	20	25	200 ft		
	39	20	20	20	25	200 ft		
	40	20	—	20	15	200 ft		
	41	20	15	15	20	200 ft		
	42	—	20	25	25	200 ft		
	43	25	20	15	15	150 ft		
	44	15	20	20	*	150 ft		* Down
	45	15	5	5	5	150 ft		
	46	10	15	20	15	100 ft		
	47	20	25	20	20	150 ft		175 ft plume
	48	20	15	20	15	150 ft		175 ft plume
	49	10	5	5	5	150 ft		200 ft plume
	50	5	10	5	5	100 ft		150 ft plume
	51	10	15	15	10	100 ft		
	52	5	5	5	5	100 ft		
	53	5	5	5	5	100 ft		
	54	10	5	5	5	100 ft		150 ft plume
	55	15	15	15	10	100 ft		
	56	10	15	15	15	100 ft		
	57	10	10	5	10	100 ft		
	58	5	10	5	5	100 ft		
1 2	59	5	5	5	5	100 ft		

RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 3 (cont)
DATE 6/20/75
TYPE FACILITY Coal Cleaning Plant
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION
OBSERVER Ron Snyder
OBSERVER CERTIFICATION DATE Apr. 1975
OBSERVER AFFILIATION Battelle Columbus Labs
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT 76 ft

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME	INITIAL	FINAL
	3:00 p.m.	: p.m.

OBSERVER LOCATION
- Distance to Discharge 400 ft
- Direction from Discharge West of Stack
- Height of Observation Point 50 ft

BACKGROUND DESCRIPTION Sky

WEATHER CONDITIONS
- Wind Direction North west
- Wind Speed 5-10 mph
- Ambient Temperature 74° F

SKY CONDITIONS (clear, overcast, % clouds, etc.) 50 % cloudy

PLUME DESCRIPTION
- Color black
- Distance Visible 1-300 ft

MINUTES OF NONCOMPLIANCE

wind direction & speed varied throughout the run
west - north - east - 0-10 mph

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OBSERVATION RECORD

COMPANY Westmoreland Coal
LOCATION Quinwood W. Va.
TEST NUMBER 3 (cont)
DATE 9/30/75

OBSERVER Ron Snider
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
3	0 PM	5	15	2[illegible]	15	100 ft		200 ft plume
	1	15	20	20	20	100 ft		
	2	25	20	15	20	100 ft		
	3	20	15	15	15	100 ft		
	4	15	15	20	20	50 ft		
	5	25	20	20	25	50 ft		
	6	—	20	20	25	100 ft		
	7	20	20	25	30	100 ft		
	8	—	—	20	25	75 ft		
	9	20	20	25	25	50 ft		
	10	—	25	20	25	50 ft		
	11	25	25	25	25	75 ft		
	12	20	25	25	25	50 ft		
	13	20	20	20	25	50 ft		
	14	20	25	20	20	50 ft		
	15	20	25	20	25	75 ft		
	16	30	30	25	25	75 ft		
	17	20	20	20	20	100 ft		
	18	20	20	20	20	100 ft		
	19	20	15	20	15	100 ft		
	20	—	15	15	20	100 ft		200 ft plume
	21	—	25	25	20	50 ft		
	22	20	25	15	20	75 ft		
	23	25	25	20	25	75 ft		
	24	20	15	20	20	75 ft		
	25	20	25	20	[illegible]	[illegible]		
	26	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] ft		
	27	15	20	20	[illegible]	75 ft		
	28	20	15	20	20	50 ft		
	29	20	20	20	15	50 ft		

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co

LOCATION [illegible]

TEST NUMBER 3

DATE 6/20/75

OBSERVER Ron Snyder

TYPE FACILITY Coal Cleaning Plant

POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
3	30	20	20	20	20	50 ft		
	31	15	15	15	15	50 ft		
	32	15	15	20	20	75 ft		
	33	—	20	20	20	75 ft		
	34	15	20	20	20	75 ft		
	35	20	20	[illegible]	[illegible]	75 ft		
	36	15	25	25	25	50 ft		
	37	20	15	15	20	50 ft		
	38	20	15	20	15	50 ft		
	39	20	15	20	15	75 ft		
	40	15	20	15	15	50 ft		
	41	20	25	20	20	50 ft		250 ft plume
	42	25	20	25	20	50 ft		
	43	20	20	20	20	50 ft		
	44	25	20	20	20	50 ft		
	45	25	30	30	30	50 ft		
	46	20	20	20	25	50 ft		
	47	25	20	25	20	50 ft		
	48	20	25	25	25	50 ft		
	49	20	15	15	20	75 ft		
	50	20	25	20	20	75 ft		150 ft plume
	51	15	20	15	15	50 ft		
	52	20	25	25	20	75 ft		
	53	20	20	20	20	50 ft		
	54	20	20	15	20	50 ft		
	55	20	25	20	20	50 ft		
	56	25	20	20	20	50 ft		
	57	20	20	20	20	75 ft		
	58	15	15	20	20	[illegible]		
	59	15	15	15	20	100 ft		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 3
DATE 6/20/75

OBSERVER Ron Sulden
TYPE FACILITY Coal cleaning plant
POINT OF EMISSIONS Coal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	0	15	20	20	15	50 Lt		
	1	15	15	15	15	40 Lt		
	2	15	15	10	20	40 Lt		150 Lt plume
	3	20	15	20	20	50 Lt		
	4	20	15	20	20	50 Lt		
	5	15	10	15	20	50 Lt		
	6	—	[illegible]			75 Lt		
	7	[illegible]			15	40 Lt		
	8	20	[illegible]	15	10	75 Lt		
	9	10	10	10	10	100 Lt		
	10	15	10	15	20	75 Lt		
	11	20	20	20	20	80 Lt		
	12	15	15	10	20	50 Lt		
	13	10	15	15	10	50 Lt		
	14	15	10	15	15	50 Lt		
	15	15	20	20	15	50 Lt		
	16	15	15	15	15	50 Lt		
	17	15	20	20	—	50 Lt		
	18	20	20	20	20	75 Lt		150 Lt plume
	19	20	20	15	15	50 Lt		
	20	[illegible]	15	15	15	50 Lt		
	21	15	20	20	20	50 Lt		
	22	20	20	20	20	75 Lt		
	23	20	20	15	15	50 Lt		
	24	20	20	20	15	50 Lt		
	25	20	20	20	20	50 Lt		
	26							
	27							
	28							
	29							

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RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 4
DATE 6/23/75
TYPE FACILITY Coal Cleaning Plant
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION 4 hrs
OBSERVER Ron Snyder
OBSERVER CERTIFICATION DATE April '75
OBSERVER AFFILIATION Battelle Columbus Lab
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT >6 ft

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME	INITIAL ___:___ a.m.	FINAL ___:___ a.m.
	3:30 p.m. (15 30)	7:30 p.m. (19 30)

OBSERVER LOCATION
- Distance to Discharge: 400 ft
- Direction from Discharge: West
- Height of Observation Point: 50 ft

BACKGROUND DESCRIPTION: Sky (clouds)

WEATHER CONDITIONS
- Wind Direction: N/W (Varies)
- Wind Speed: 0-5 mph
- Ambient Temperature: 75°F

SKY CONDITIONS (clear, overcast, % clouds, etc.): 98 % clouds

PLUME DESCRIPTION
- Color: Black
- Distance Visible: 300 ft

MINUTES OF NONCOMPLIANCE:

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 4
DATE 6/23/75

OBSERVER Ronald E Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
3	30	25	30	30	30	75 ft		3:30 pm
	31	25	25	25	20	75 ft		plume visible 250 ft
	32	20	25	30	25	150 ft		
	33	20	20	25	25	100 ft		
	34	15	15	15	15	100 ft		200 ft plume
	35	15	15	10	10	100 ft		
	36	10	15	15	15	75 Ft		
	37	20	15	20	20	75 ft		
	38	15	15	15	20	75 Ft		
	39	20	25	20	15	125 ft		
	40	15	15	15	20	125 ft		
	41	15	10	15	15	125 ft		
	42	20	15	20	20	125 Ft		
	43	20	20	15	20	100 Ft		
	44	20	20	20	20	100 Ft		
	45	20	15	20	15	125 Ft		
	46	20	10	10	10	100 Ft		
	47	15	15	10	10	125 Ft		
	48	10	10	15	15	125 Ft		
	49	10	10	10	10	150 ft		south wind 5 mph
	50	10	10	10	10	125 Ft		100% clouds - (White cloud background)
	51	15	10	15	10	150 Ft		
	52	10	15	15	15	150 Ft		North wind 4-6 mph
	53	15	15	15	10	125 Ft		
	54	10	10	15	15	150 Ft		
	55	15	15	15	15	125 Ft		300 FT plume
	56	15	20	20	20	100 Ft		Dark Rainclouds - moving into background
	57	15	10	15	15	125 Ft		
	58	15	10	15	20	125 Ft		
	59	20	20	20	20	125 Ft		

OBSERVATION RECORD

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va
TEST NUMBER 4
DATE 6/23/75

OBSERVER Ronald E Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	0	15	15	20	15	125 FT		300 ft plume
	1	15	15	15	10	125 FT		south wind 4-6 mph
	2	10	10	15	10	125 FT		
	3	10	15	10	10	125 FT		
	4	15	15	15	10	125 FT		
	5	15	15	15	15	125 FT		
	6	15	10	10	10	125 FT		
	7	15	10	10	15	125 FT		
	8	15	15	15	15	125 FT		
	9	15	15	15	15	125 FT		
	10	15	15	20	20	125 FT		
	11	15	15	15	10	125 FT		
	12	10	15	15	15	150 FT		
	13	15	10	10	15	150 FT		
	14	10	10	15	15	150 FT		
	15	15	15	15	10	150 FT		
	16	10	10	15	15	150 FT		
	17	15	10	15	15	150 FT		
	18	15	15	15	15	150 FT		
	19	15	20	15	20	125 FT		
	20	20	15	20	20	150 FT		
	21	20	15	15	15	150 FT		250 FT Plume
	22	15	15	20	20	150 FT		
	23	15	15	15	20	150 FT		
	24	15	20	20	20	125 FT		
	25	15	20	20	20	150 FT		
	26	20	20	20	20	150 FT		
	27	20	15	20	20	150 FT		
	28	15	20	20	20	150 FT		
	29	15	15	15	15	150 FT		

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co. OBSERVER Ron Snyder
LOCATION Quinwood W. Va TYPE FACILITY Coal Cleaning Plant
TEST NUMBER 4 POINT OF EMISSIONS Thermal Dryer
DATE 6/23/75

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	30	15	15	15	20	150 FT		
	31	15	15	15	15	150 FT		
	32	15	15	15	15	150 FT		
	33	20	15	15	15	150 FT		
	34	10	15	10	10	150 FT		
	35	15	10	15	15	200 FT		South wind 1-2 MPH
	36	15	15	15	15	200 FT		
	37	15	15	15	15	200 FT		
	38	15	15	10	10	250 FT		300 FT Plume
	39	15	15	15	15	250 FT		
	40	15	15	15	15	250 FT		0-1 MPH South wind
	41	15	15	15	15	175 FT		0-5 MPH S/W wind
	42	15	15	15	0	175 FT		
	43	15	15	10	10	175 FT		
	44	15	15	15	15	175 FT		
4	45	15	15	15	10	175 FT		
	46	10	10	10	10	175 FT		300 FT Plume
	47	15	15	15	10	225 FT		Wind 0-1 MPH South
	48	5	10	5	5	250 FT		
	49	5	5	10	5	250 FT		300 FT Plume
	50	5	5	5	10	225 FT		
	51	5	10	5	5	250 FT		
	52	5	10	5	5	225 FT		
	53	5	5	5	5	225 FT		
	54	5	5	5	10	200 FT		
	55	10	10	5	5	150 FT		
	56	5	5	5	5	175 FT		
	57	5	5	5	5	175 FT		
	58	5	5	5	5	175 FT		
	59	5	10	10	10	175 FT		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va.
TEST NUMBER 4
DATE 6/23/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
5	0	10	5	5	5	150 FT		300 FT plume
	1	10	5	5	10	150 FT		
	2	10	10	10	10	175 FT		
	3	10	10	10	15	175 FT		
	4	10	10	15	10	200 FT		
	5	10	10	5	5	225 FT		Light cloud background
	6	5	10	5	10	250 FT		300 FT plume
	7	5	5	5	5	225 FT		NO-wind
	8	5	5	5	5	275 FT		NO-wind
	9	5	5	5	5	275 FT		"
	10	5	5	10	10	250 FT		"
	11	10	10	5	10	200 FT		1-2 mph N/W wind
	12	5	5	5	10	200 FT		
	13	5	10	5	5	225 FT		3 mph S/W wind.
	14	5	5	5	5	200 FT		250 FT plume
	15	5	5	5	5	200 FT		
	16	10	5	5	10	200 FT		
	17	5	10	5	5	200 FT		
	18	10	5	10	10	200 FT		
	19	10	10	10	5	200 FT		
	20	5	5	5	5	200 FT		
	21	10	10	10	5	225 FT		
	22	5	5	10	5	250 FT		
	23	10	10	10	10	250 FT		(Straight up) plume
	24	10	10	10	10	250 FT		
	25	5	5	5	5	225 FT		
	26	5	5	5	5	225 FT		
	27	10	5	5	10	200 FT		~90% clouds - scattered
	28	10	5	5	5	200 FT		clouds behind plume (50%)
	29	5	10	5	10	200 FT		

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 4
DATE 6/23/75

OBSERVER Ron Snyder
TYPE FACILITY Coal cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
5	30	5	10	10	10	200 FT		N/E wind 0-5 mph 15
	31	10	10	5	5	200 FT		80% clouds 50% clouds behind plume)
	32	5	10	10	5	200 FT		
	33	10	10	10	10	200 FT		250 FT plume
	34	10	10	10	10	200 FT		S/E wind 3-6 mph
	35	5	5	5	5	200 FT		
	36	10	10	10	10	200 FT		
	37	10	10	10	10	200 FT		S/E wind 0-5 mph
	38	10	10	10	10	200 FT		65% clouds (40% clouds behind plume)
	39	10	10	10	10	200 FT		300 FT plume
	40	10	10	10	10	200 FT		
	41	15	10	15	10	175 FT		
	42	10	10	15	10	200 FT		
	43	10	5	5	10	200 FT		
	44	10	10	15	10	200 FT		
	45	10	10	10	15	200 FT		
	46	10	10	15	15	200 FT		
	47	15	15	15	15	200 FT		
	48	10	10	15	15	200 FT		
	49	15	15	15	15	175 FT		
	50	15	15	15	15	200 FT		
	51	15	15	15	15	200 FT		
	52	15	15	15	15	200 FT		
	53	15	15	10	15	200 FT		
	54	15	15	10	10	200 FT		
	55	10	10	10	10	200 FT		
	56	10	10	10	10	200 FT		
	57	10	10	10	10	200 FT		
	58	10	10	10	10	225 FT		
	59	10	10	10	10	225 FT		

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OBSERVATION RECORD

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COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va
TEST NUMBER 4
DATE 6/22/75

OBSERVER Ronald E Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
6	0	10	10	10	10	225 FT		50% clouds
	1	10	10	10	10	225 FT		
	2	10	10	10	10	225 FT		N/E wind 0-5 mph
	3	10	10	10	10	200 FT		300 FT plume
	4	10	10	10	10	200 FT		
	5	10	10	10	10	200 FT		Run outlet
	6	10	10	10	10	200 FT		30% clouds
	7	10	10	10	10	200 FT		S/W wind 0-5 mph
	8	10	10	10	10	200 FT		
	9	10	10	10	10	200 FT		
	10	10	10	10	10	200 FT		
	11	10	10	10	10	200 FT		
	12	10	10	10	10	200 FT		
	13	10	10	10	10	200 FT		
	14	10	10	10	10	200 FT		
	15	10	10	10	10	200 FT		
	16	10	10	10	10	200 FT		
	17	10	10	10	10	200 FT		
	18	10	10	10	10	200 FT		
	19	10	10	10	10	200 FT		
	20	10	10	10	10	200 FT		
	21	10	10	10	10	200 FT		
	22	10	10	10	10	200 FT		
	23	10	10	10	10	200 FT		
	24	10	10	10	10	200 FT		
	25	10	10	15	15	150 FT		300 FT plume
	26	15	10	10	10	150 FT		10% clouds 0-5 mph N/E
	27	10	10	10	10	175 FT		
	28	10	10	10	10	175 FT		
	29	10	10	10	10	175 FT		

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va
TEST NUMBER 4
DATE 6/23/75

OBSERVER Ronald E Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
6	30	10	10	15	15	150 FT		300 FT plume
	31	15	10	15	15	150 FT		
	32	15	15	10	15	150 FT		
	33	10	15	15	10	150 FT		
	34	10	10	10	10	150 FT		
	35	15	15	15	15	150 FT		
	36	15	15	10	10	150 FT		
	37	10	10	10	10	150 FT		
	38	10	10	10	10	150 FT		
	39	10	10	10	10	150 FT		
	40	15	15	15	10	150 FT		
	41	10	10	10	10	150 FT		
	42	10	10	10	10	150 FT		
	43	10	15	10	15	125 FT		
	44	15	15	15	15	125 FT		
	45	15	15	15	15	150 FT		scattered
	46	15	15	15	15	125 FT		5% clouds - NE wind 2-5 mph
	47	15	15	15	15	125 FT		
	48	20	15	15	20	125 FT		300 FT plume
	49	20	20	15	20	125 FT		
	50	20	25	20	15	125 FT		
	51	20	20	20	20	125 FT		
	52	15	15	15	15	125 FT		
	53	15	15	15	15	125 FT		
	54	20	20	20	15	125 FT		
	55	20	25	20	20	125 FT		
	56	20	25	20	25	125 FT		
	57	20	20	20	20	125 FT		
	58	20	20	20	25	125 FT		
	59	20	20	20	20	125 FT		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co
LOCATION Quinwood W Va
TEST NUMBER 4
DATE 6/23/75

OBSERVER R. Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1	0	15	20	20	15	125 FT		5% scattered clouds
	1	20	15	15	15	[illegible]		2-4 mph NE wind
	2	15	15	15	15	125 FT		
	3	15	15	15	15	125 FT		
	4	15	20	15	15	125 FT		300 FT plume
	5	15	10	15	15	125 FT		
	6	15	15	15	15	100 FT		
	7	15	15	15	15	100 FT		
	8	15	15	15	15	100 FT		
	9	15	15	15	15	100 FT		
	10	15	15	15	15	100 FT		
	11	15	15	15	15	100 FT		
	12	15	15	15	15	100 FT		
	13	15	15	15	15	100 FT		
	14	15	15	15	15	100FT		
	15	15	15	15	15	[illegible]		
	16	15	20	20	15	[illegible]		
	17	20	15	15	15	[illegible]		
	18	15	15	15	15	[illegible]		
	19	20	15	20	15	125 FT		
	20	15	20	15	15	125 FT		300 FT plume
	21	15	15	15	15	125 FT		
	22	15	15	15	15	125 FT		
	23	15	15	15	15	125FT		
	24	15	15	20	20	125 FT		
	25	20	20	20	20	125 FT		
	26	20	15	20	20	125 FT		
	27	25	20	20	20	150FT		
	28	20	20	20	20	150FT		
	29	20	20	20	20	150 FT		

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RECORD OF VISUAL DETERMINATION OF OPACITY

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 5
DATE 6/25/75
TYPE FACILITY Coal Cleaning Co.
CONTROL DEVICE Venturi Scrubber

HOURS OF OBSERVATION
OBSERVER Ron Snyder
OBSERVER CERTIFICATION DATE April '75
OBSERVER AFFILIATION Battelle Columbus Labs
POINT OF EMISSIONS Thermal Dryer
HEIGHT OF DISCHARGE POINT 76 ft

Record the following information prior to and upon completion of observations at each source. If observations are made over an extended period of time, additional recordings should be made as applicable.

CLOCK TIME INITIAL 10:08 a.m. FINAL ___:___ a.m.
___:___ p.m. ___:___ p.m.
1008 → 1715

OBSERVER LOCATION
Distance to Discharge 150 FT
Direction from Discharge East S/E
Height of Observation Point 50 FT
BACKGROUND DESCRIPTION Sky
WEATHER CONDITIONS
Wind Direction N/E
Wind Speed 0-5 mph
Ambient Temperature 75 °F
SKY CONDITIONS (clear, overcast, % clouds, etc.) 10 % clouds
PLUME DESCRIPTION
Color Black-Brown
Distance Visible 2-300 FT
MINUTES OF NONCOMPLIANCE

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co
LOCATION Quinwood W Va
TEST NUMBER 5
DATE 6/25/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds' 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	0							
	1							
	2							
	3							
	4							
	5							
	6							
	7							
10	8	20	25	20	25	50 FT		water plume thick
	9	20	25	25	25	50 FT		300 FT plume
	10	25	20	20	20	50 FT		water plume thick again
	11	20	15	20	20	25 FT.		
	12	20	20	20	20	50 FT		
	13	20	20	20	20	50 FT		
	14	15	20	20	20	50 FT		water vapor plume thin
	15	25	30	30	30			no vapor plume
	16	20	20	20	25			
	17	20	20	20	20	50 FT		
	18	20	20	25	25	50 FT		
	19	20	25	25	25	50 FT		
	20	25	25	25	25	50 FT		
	21	25	25	25	25	50 FT		
	22	25	25	25	25			
	23	30	30					
	24							
	25							
	26							
	27							
	28							
	29							

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va.
TEST NUMBER 5
DATE 6/25/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
10	30							
	31							
	32							
	33							
	34							
	35							
	36							
	37							Process
	38							
	39							
	40							Down
	41							
	42							
	43							
	44							
	45							
	46							
	47							
	48							
	49							
	50							
	51							
	52							
	53							
	54							
	55							
	56							
	57							
	58							
	59							

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OBSERVATION RECORD

COMPANY Westmoreland

LOCATION Quinwood W. Va

TEST NUMBER 5

DATE 6/25/75

OBSERVER Don Snyder

TYPE FACILITY Coal Cleaning Plant

POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
11	0	15	15	15	15	50 ft		11:00 AM outlet R...
	1	20	20	15	15	50 ft		
	2	15	15	15	15	50 ft		
	3	15	15	15	20	50 FT		
	4	20	15	15	20	50 FT		
	5	15	15	15	15	50 FT		Inlet Run
	6	15	15	15	15	50 FT		SKY 20% cl...
	7	15	15	15	15	50 FT		Wind N/E 0-5 mph Inlet-out
	8	15	15	15	15	50 FT		
	9	15	15	15	15	50 FT		300 FT plume
	10	15	15	15	15	50FT		
	11	10	10	15	15	75FT		
	12	15	15	15	15	75FT		Wind out of N/W 0-5 mph
	13	15	15	15	15	75FT		
	14	15	15	10	15	75FT		
	15	15	15	15	15	50 FT		
	16	15	15	15	15	75FT		
	17	15	15	15	15	75FT		Inlet Run
	18	15	15	15	15	75FT		
	19	15	15	15	15	75FT		Wind out of N/E 0-5 mph
	20	15	15	15	15	75 FT		
	21	15	15	15	15	75 FT		
	22	15	15	15	15	75 FT		
	23	15	20	20	20	75 FT		
	24	20	20	20	20	75 FT		
	25	25	15	20	20	75 FT		
	26	20	20	20	20	75 FT		
	27	20	15	20	20	75 FT		
	28	25	20	20	25	75 FT		
	29	25	25	20	20	50 FT		

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co.
LOCATION Quinwood Coal Co.
TEST NUMBER 5
DATE 6/25/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
11	30	20	20	20	25	40 FT		Water vapor plume not heavy
	31	25	25	25	25	40 FT		
	32	30	20	25	30	40 FT		
	33	30	30	30	25	40 FT		Process Down
	34	25	25	25	30	40 FT		
	35	25	25	25	25	50 FT		300 FT plume
	36	20	20	20	20	75 FT		
	37	25	25	25	20	50 FT		Inlet out
	38	20	20	20	20	50 FT		
	39	20	15	15	20	50 FT		water vapor plume heavy again
	40	15	20	15	20	50 FT		
	41	25	25	25	25	75 FT		
	42	30	25	25	25	75 FT		
	43	25	25	25	25	75 FT		
	44	25	20	20	20	75 FT		
	45	20	20	25	25	75 FT		
	46	20	25	25	20	75 FT		
	47	25	20	20	25	75 FT		
	48	25	20	20	20	50 FT		N/W wind 1.5-10 m/s
	49	20	20	20	20	50 FT		20% clouds
	50	20	25	20	20	75 FT		
	51	20	20	20	20	50 FT		N-wind 0-5 m/s
	52	25	25	25	20	50 FT.		
	53	20	20	15	15	75 FT		300 FT plume
	54	20	20	15	15	75 FT		
	55	15	15	15	15	75 FT		
	56	20	20	20	15	75 FT		
	57	*10	30	25	25	—	—	*No vapor (water plume)
	58	*30	5	5	5	—	—	
	59	40	30	25	20	50 FT		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co
LOCATION Quinwood W Va
TEST NUMBER 5
DATE 6/25/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
12	0	35	40	40	30	40 ft		* no visible water plume
	1	25	25	25	20	75 FT.		varying
	2	15	20	15	20	75 ft		
	3	15	15	20	20	50 ft		Process Down
	4	20	20	20	20	50 ft		
	5	20	20	20	20	75 ft		
	6	25	25	20	20	75 ft		
	7	25	20	25	20	75 ft		250 ft plume
	8	25	25	25	20	75 ft		
	9	25	20	25	25	50 ft		
	10	30	25	20	25	75 FT		North East wind 0-5 mph
	11	20	20	20	20	75 FT		
	12	25	20	20	20	75 FT		
	13	25	25	20	20	50 FT		
	14	25	25	20	20	50 FT		N/W wind 5 mph
	15	20	25	25	25	50 FT		
	16	20	25	25	20	50 FT		
	17	20	20	20	25	50 FT		
	18	25	25	20	20	50 FT		
	19	25	25	25	20	50 FT		
	20	25	25	25	25	50 FT		N/E 0-5 mph wind
	21	25	20	20	25	50 FT		
	22	25	20	20	20	50 FT		
	23	25	30	25	25	50 FT		Inlet In
	24	30	25	20	20	50 FT		
	25	25	25	25	25	50 FT		
	26	25	25	25	20	50 FT		
	27	25	20	20	20	50 FT		
	28	20	20	25	20	50 FT		
	29	25	25	20	20	50 FT		

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va.
TEST NUMBER 15
DATE 6/25/75

OBSERVER Con Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
12	30	20	20	20	20	50 Ft		
	31	20	20	20	20	50 Ft		N/W wind 5 m.p.h
	32	20	20	20	20	50 Ft		Plume 250 ft
	33	20	20	20	20	50 FT		
	34	20	20	20	20	50 Ft		
	35	20	20	20	20	50 Ft		
	36	20	20	20	20	50 Ft		
	37	20	20	20	20	50 Ft		
	38	20	20	20	20	50 FT		
	39	20	25	20	20	50 Ft		
	40	20	25	25	20	50 Ft		
	41	25	25	25	25	50 Ft		
	42	25	25	25	25	50 Ft		
	43	25	25	25	25	50 Ft		
	44	25	30	30	30	50 Ft		
	45	25	25	25	20	50 Ft		
	46	20	25	25	25	75 Ft		
	47	25	30	25	30	75 Ft		
	48	25	30	30	30	75 Ft		
	49	30	30	30	25	75 Ft		
	50	25	25	25	20	75 Ft		
	51	25	25	25	25	75 Ft		300 Ft Plume
	52	30	25	25	25	75 Ft		N/W wind 5 m.p.h
	53	25	25	20	20	75 Ft		40% cloud
	54	25	25	20	25	100 Ft		
	55	25	25	25	25	100 Ft		
	56	25	25	25	25	75 Ft		
	57	25	25	25	25	75 Ft		
	58	25	25	25	25	75 Ft		
	59	30	25	25	20	75 Ft		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 5
DATE 6/24/25

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1	0	20	20	20	20	75 Ft		
	1	20	20	20	25	75 Ft		
	2	20	25	25	20	75 Ft		
	3	20	25	25	25	75 Ft		
	4	20	25	25	25	50 Ft		
	5	25	25	25	25	50 Ft		250 Ft plume
	6	25	30	25	25	50 Ft		
	7	20	25	20	25	50 Ft		
	8	24	20	25	30	50 Ft		
	9	25	20	25	25	50 Ft		
	10	25	25	25	30	50 Ft		
	11	30	25	25	25			
	12	25	30	25	25			
	13	—	—	—	—			
	14	—	—	—	—	Moved from SE Location To west Location		
	15	—	—	—	—			
	16	—	—	—	—			
	17	20	20	20	20	75 FT		
	18	20	20	20	20	100 FT		
	19	20	20	20	20	100 FT		
	20	20	20	20	20			
	21	—	—	—	—			
	22	—	—	—	—			
	23	—	—	—	—			
	24	—	—	—	—			70 So plume is cloud background
	25	20	25	20	25	100 Ft		
	26	25	25	25	25	100 FT		
	27	25	25	25	25	100 FT		S/E wind 3.5 mph
	28	25	25	25	25	100 Ft		
	29	25	25	25	25	100 Ft		

OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co

LOCATION Quinwood W. Va

TEST NUMBER 5

DATE 6/25/75

OBSERVER Ron Snyder

TYPE FACILITY Coal Cleaning plant

POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1	30	25	25	25	25	75 ft		
	31	25	25	20	20	75 ft		250 ft plume
	32	25	20	20	25	75 ft		
	33	20	20	20	20	75 ft		
	34	25	20	25	25	75 ft		
	35	25	20	25	25	75 ft		
	36	20	25	20	20	75 ft		
	37	15	20	25	20	75 ft		
	38	25	20	25	20	75 ft		
	39	20	20	20	25	75 ft		
	40	20	20	20	20	75 ft		
	41	25	20	20	20	75 FT		
	42	20	20	20	20	75 FT		
	43	25	20	25	25	75 ft		
	44	20	25	25	25	75 ft		
	45	25	25	25	25	75 ft		
	46	25	25	25	20	100 ft		
	47	25	20	20	25	100 ft		N/E wind 2-[illegible] mph
	48	20	20	25	20	100 ft		70% clouds
	49	25	20	20	20	100 ft		
	50	20	20	20	20	100 ft		
	51	—	—	25	25	100 ft		- wind interference
	52	20	20	25	20	100 ft		
	53	20	20	20	25	100 ft		
	54	30	30	25	25	75 FT		
	55	25	25	25	25	100 ft		250 ft plume
	56	25	25	25	25	100 ft		
	57	25	25	25	25	100 ft		
	58	25	25	20	20	100 ft		
	59	20	20	25	20	100 ft		S/E wind 3-5 mph

Pitcher stopped reading at 1400 for 1/2 hr. did Snyder?

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 5
DATE 6/24/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
2	30	25	25	30	30	75 FT		90% clouds (hazy)
	31	30	25	30	25	75 FT		N/E wind 3-8 mph
	32	25	30	30	30	75 FT		
	33	30	30	30	30	75 FT		
	34	35	30	35	30	50 FT		
	35	30	35	30	30	>5 FT		
	36	30	35	35	30	75 ft		
	37	35	30	30	30	50 ft		
	38	30	35	35	35	75 ft		
	39	35	40	45	40	100 ft		
	40	35	40	45	40	100 ft		
	41	45	45	40	35	100 ft		
	42						—	Process Shut down -
	43						—	Probe Broke -
	44						—	Repair period
3	45	10	10	10	10	125 ft		3:45 pm - 70% clouds, haze, 75°F
	46	10	10	10	10	125 ft		S/E wind 3-12 mph
	47	10	10	10	10	125 ft		250 ft plume
	48	10	15	15	15	125 ft		
	49	10	15	10	10	125 ft		
	50	15	10	10	15	125 ft		
	51	15	15	15	15	125 ft		
	52	15	10	10	10	125 ft		
	53	15	10	10	10	125 ft		
	54	15	10	10	15	125 ft		
	55	10	15	15	10	125 ft		
	56	10	10	10	10	125 ft		
	57	15	15	15	15	125 ft		
	58	10	10	10	10	125 ft		
	59	15	10	10	15	125 ft		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va
TEST NUMBER 5
DATE 6/25/75

OBSERVER [illegible]
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
4	30	15	15	15	15	125 Lt		
	1	15	15	15	15	125 Lt		
	2	10	10	15	10	125 Lt		
	3	15	10	10	15	125 Lt		70% clouds hazy
	4	10	10	15	15	125 Lt		SE wind 0-5 mph
	5	15	15	10	15	125 Lt		
	6	15	15	15	15	125 Lt		
	7	15	15	15	20	100 Lt		
	8	15	15	15	10	75 Lt		200 Ft plume
	9	15	15	10	15	75 Lt		
	40	15	10	15	15	100 Lt		
	11	15	15	10	15	100 Lt		
	12	15	10	15	15	100 Lt		
	13	15	10	15	15	100 Lt		
	14	15	15	15	15	100 Lt		
	45	15	10	15	10	100 Lt		
	16	15	15	15	10	100 Lt		
	17	15	15	15	15	75 Lt		
	18	10	10	15	10	75 Lt		
	19	10	15	15	15	75 Lt		
	20	15	15	15	15	100 Lt		
	21	15	15	15	10	75 Lt		
	22	15	15	15	15	75 Lt		
	23	15	15	15	15	100 Lt		
	24	15	15	15	15	100 Lt		
	25	15	15	10	10	100 Lt		
	26	15	10	15	15	100 Lt		200 Ft plume
	27	15	15	15	15	100 Lt		
	28	15	15	15	15	100 Lt		
	29	15	15	15	15	100 Lt		

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OBSERVATION RECORD
(Cont.)

COMPANY Westmoreland Coal Co
LOCATION Quinwood W. Va
TEST NUMBER 5
DATE 6/25/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
1630	30	15	15	15	15	75 Lt		
	31	15	15	15	15	75 Lt		
	32	15	15	20	15	75 Lt		
	33	15	20	15	15	75 Lt		
	34	15	15	15	15	75 Lt		300 Lt plume
	35	15	15	15	15	100 Lt		
	36	15	15	15	15	75 Lt		
	37	15	15	15	15	75 Lt		
	38	15	15	15	15	75 Lt		
	39	15	15	15	15	75 Lt		
	40	20	15	20	15	75 Lt		
	41	15	15	15	20	75 Lt		
	42	15	15	15	15	50 Lt		
	43	15	15	15	15	75 Lt		
	44	15	15	20	15	50 Lt		
	45	15	15	15	15	75 Lt		- hazy sky condition
	46	15	15	15	15	75 Lt		65% clouds
	47	15	20	15	15	75 Lt		SE wind 3-5 mph
	48	15	10	10	10	75 Lt		
	49	15	15	15	15	75 Lt		250 Lt plume
	50	15	15	15	15	75 Lt		
	51	15	10	15	15	75 Lt		
	52	15	15	15	15	75 Lt		
	53	15	15	15	10	75 Lt		
	54	15	10	10	10	50 Lt		
	55	10	10	5	5	50 Lt		with plume many thin
	56	5	20	30	25	50 Lt		" "
	57	25	20	20	25	50 Lt		"
	58	25	20	20	20	50 Lt		
	59	20	20	20	20	50 Lt		

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OBSERVATION RECORD

COMPANY Westmoreland Coal Co.
LOCATION Quinwood W. Va
TEST NUMBER 5
DATE 6/25/75

OBSERVER Ron Snyder
TYPE FACILITY Coal Cleaning Plant
POINT OF EMISSIONS Thermal Dryer

Hr	Min	Seconds 0	15	30	45	STEAM PLUME (check if applicable) Attached	Detached	COMMENTS
	0	20	20	20	20	50 ft		Water plume very thin
	1	20	15	15	20	50 ft		"
	2	20	20	20	15	50 ft		"
	3	20	20	20	20	50 ft		"
	4	15	20	20	20	50 ft		"
	5	20	20	20	20	50 ft		Very very Little water vapor plume
	6	20	20	20	20	50 ft		almost [illegible]
	7	20	20	20	20	50 ft		"
	8	20	20	20	20	50 ft		"
	9	15	20	20	20	50 ft		very little water vapor
	10	20	20	20	20	50 ft		plume
	11	20	20	20	20	50 ft		"
	12	20	20	25	20	50 ft		"
	13	20	25	25	20	50 ft		"
	14	20	20	20	20	50 ft		"
	15	20	20	20	20	50 ft		"
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							

Multiple-Cyclone Particle
Size Field Data

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Triple Cyclone

RUN CODE NO. 1C

OPERATOR NEULICHT

DATE 6/18/75

SAMPLING LOCATION INLET

PORT NO. North

PROBE DEPTH Traverse

STACK PRES. 29" H_2O

AMB. PRES. 27.55

STACK TEMP. ≈190

IMPACTOR TEMP. STACK

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S)

PITOT DELTA P

GAS VELOCITY

IMP. FLOW RATE ≈1 ACFM

NOZZLE DIA. 7/16"

IMPACTOR DELTA P.

START TIME ~~2 PM~~ ≈600P

GAS METER END 234.450

TOTAL SAMPLING TIME 22 min

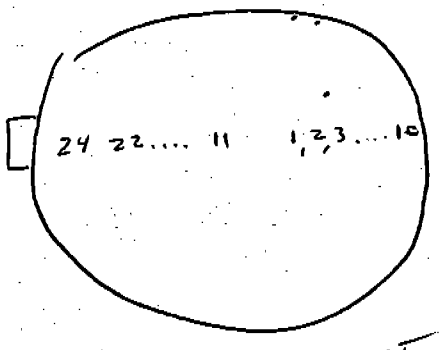
GAS METER START 231.605

METERING ORIFICE ΔP 6.5" H_2O

METERING ORIFICE TEMP.

PRESS. AT METERING ORIFICE Barometric

REMARKS:



START short TRAVERSE AT POINT # 13

Brown Impinger

(used incorrect nozzle size)

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Single Cyclone

OPERATOR Neukelt

DATE 6/19/75

RUN CODE NO. 2C

PORT NO. N

PROBE DEPTH Traverse

SAMPLING LOCATION Inlet

AMB. PRES. 27.67

STACK TEMP. ≈ 190

STACK PRES. 29 " H_2O

IN STACK / OUT-OF-STACK

IMPACTOR TEMP. STACK

SCALPING CYCLONE(S)

PITOT DELTA P

GAS VELOCITY

IMP. FLOW RATE 1.0 ACFM

NOZZLE DIA. 7/16"

IMPACTOR DELTA P.

START TIME 1415

GAS METER END 266.280

TOTAL SAMPLING TIME 10 MIN

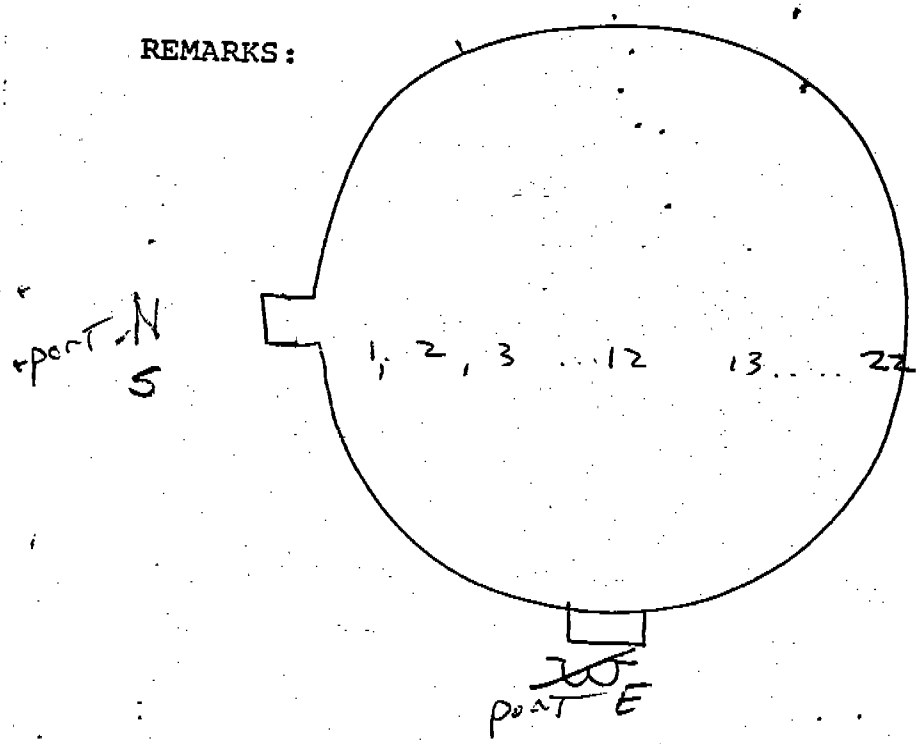
GAS METER START 258.280

METERING ORIFICE ΔP 6.0 " H_2O

METERING ORIFICE TEMP.

PRESS. AT METERING ORIFICE Barometric

REMARKS:



Missed Points 13 and 14

(used incorrect nozzle size)

(Cleanup - some material in cyclone 1 (cone) questionable as to whether cyclone catch or Bruton filter catch)

FIGURE 4

FIELD DATA

IMPACTOR IDENT.

RUN CODE NO. 3C

OPERATOR NEULICHT

DATE 6/19/75

SAMPLING LOCATION INLET

PORT NO. N

PROBE DEPTH TRAVERSE

STACK PRES. 29" H_2O

AMB. PRES. 27.67

STACK TEMP. ≈ 170

IMPACTOR TEMP. STACK

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S) ✓

PITOT DELTA P

GAS VELOCITY

IMP. FLOW RATE ≈ 1.0 ACFM

NOZZLE DIA. # 1 7/16"

IMPACTOR DELTA P.

START TIME 1715

GAS METER END 278.945

TOTAL SAMPLING TIME 11 MIN

GAS METER START 268.425

METERING ORIFICE ΔP 0.60

METERING ORIFICE TEMP. ≈ 85

PRESS. AT METERING ORIFICE Barometric

REMARKS:

~~START STOP~~

Time	VAC	ΔH
5 min	10"	
10 min	20"	5"

(used incorrect nozzle size)

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Single cyclone/Filter

RUN CODE NO. 4C

OPERATOR Neulicht

DATE 6/20/75

SAMPLING LOCATION Inlet

PORT NO. W

PROBE DEPTH Traverse

STACK PRES. 29" H_2O

AMB. PRES. 27.67

STACK TEMP. ≈ 170

IMPACTOR TEMP. Stack

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S) ✓

PITOT DELTA P

GAS VELOCITY

IMP. FLOW RATE ≈ 1 ACFM

NOZZLE DIA. 7/16

IMPACTOR DELTA P.

START TIME 1115A

GAS METER END 286.445

TOTAL SAMPLING TIME 11 min

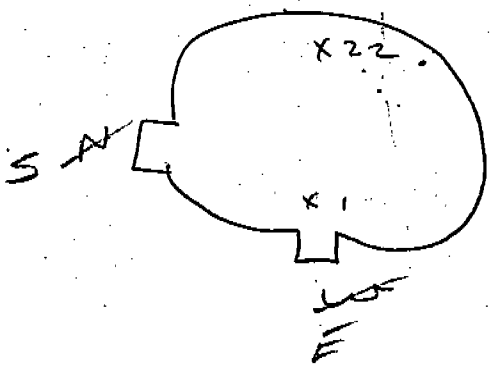
GAS METER START 279.215

METERING ORIFICE ΔP 6.0 inches

METERING ORIFICE TEMP.

PRESS. AT METERING ORIFICE Barametric

REMARKS:



Time	VAC "Hg	ΔH "H_2O
5	20	5
7	20	3
8	22	2.5
9	22	2.0
10	22	1.5
11		

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Dual cyclone/Fink — RUN CODE NO. 5C

OPERATOR Neulicht — DATE 6/20/75 — SAMPLING LOCATION Inlet

PORT NO. W — PROBE DEPTH Traverse — STACK PRES. 29" H_2O

AMB. PRES. 27.67 — STACK TEMP. ≃ 170 — IMPACTOR TEMP. Stack

IN STACK/OUT-OF-STACK — SCALPING CYCLONE(S) ✓

PITOT DELTA P — GAS VELOCITY — IMP. FLOW RATE ≃ 14 CFM

NOZZLE DIA. #10 - 7/16" — IMPACTOR DELTA P. — START TIME 1445

GAS METER END 295.860 — TOTAL SAMPLING TIME 11 min

GAS METER START 286.810 — METERING ORIFICE ΔP 6.5" H_2O

METERING ORIFICE TEMP. — PRESS. AT METERING ORIFICE Barometer

REMARKS:

Missed first 4 Traverse Points due to incorrect probe marking

Time	Vac "Hg	ΔH Inch H_2O
9	19	5.5
10	19	4.5
11	19	

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Dual Cyclone / Filter

RUN CODE NO. 7C

OPERATOR NEULICHT

DATE 6/23/75

SAMPLING LOCATION INLET

PORT NO. ~~10~~ E

PROBE DEPTH Traverse

STACK PRES. 29" H_2O

AMB. PRES. 27.68

STACK TEMP. 200

IMPACTOR TEMP. STACK

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S)

PITOT DELTA P

GAS VELOCITY

IMP. FLOW RATE ≈ 1 ACFM

NOZZLE DIA. #10 3/16"

IMPACTOR DELTA P.

START TIME ≈ 800 P

GAS METER END 313.800

TOTAL SAMPLING TIME 11 MIN

GAS METER START 305.20

METERING ORIFICE ΔP 5.0

METERING ORIFICE TEMP.

PRESS. AT METERING ORIFICE Barometric

REMARKS:

30 minute preheat

30 SEC / POINT

Time	Vac "Hg	ΔH "H_2O
5	7	5
6	10	5
8	14	5
10	19	5
11	20	4.0

Good Run

FIGURE 4

FIELD DATA

IMPACTOR IDENT. dual cyclone / filter — RUN CODE NO. 6C

OPERATOR Neulicht — DATE 6/23/75 — SAMPLING LOCATION Inlet

PORT NO. 6E — PROBE DEPTH Traverse — STACK PRES. 29" H20

AMB. PRES. 27.68 — STACK TEMP. ≈ 200 — IMPACTOR TEMP. Stack

IN STACK/OUT-OF-STACK — SCALPING CYCLONE(S)

PITOT DELTA P — GAS VELOCITY — IMP. FLOW RATE 1ACFM

NOZZLE DIA. #10 3/16" init — IMPACTOR DELTA P. — START TIME ≈ 1700

10% moisture

GAS METER END 304.990 — TOTAL SAMPLING TIME 11 min 20 sec

GAS METER START 296.315 — METERING ORIFICE ΔP 5.5"

" METERING ORIFICE TEMP. — PRESS. AT METERING ORIFICE Barometer

REMARKS:

Traverse 30. seconds / point

wet Filter ⟶ discarded

⟶ saved cyclone runs for Coulter Analysis

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Brink

RUN CODE NO. 1B

OPERATOR Neubrecht

DATE 6/24/75

SAMPLING LOCATION Inlet

PORT NO. ~~10~~ E

PROBE DEPTH 53"

STACK PRES. 29" H_2O

AMB. PRES. 27.68

STACK TEMP. 146 (Dial Therm)

IMPACTOR TEMP. STACK

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S)

PITOT DELTA P 3.0"

GAS VELOCITY

IMP. FLOW RATE (.04 Scmeter) ≈ 0.55 ACFM

NOZZLE DIA. 1mm

IMPACTOR DELTA P.

START TIME 1330

GAS METER END 333.395

TOTAL SAMPLING TIME 3 min

GAS METER START 333.200

METERING ORIFICE ΔP N/A

METERING ORIFICE TEMP. ≈80

PRESS. AT METERING ORIFICE N/A

REMARKS:

Traverse Point #16 = .54"

Δp prel. Traverse = 2.75 → V_s = 106 FPS

1mm nozzle → .055 ACFM

Begin preheat @ 1315

minutes	
0.0	– start pump set Flow
0.5	– Enter Stack
3.5	– Remove from Stack
4.0	– Shut off pump

#2 stage slightly overloads

Particulate slightly moist – Adheres to inside of nozzle

$$Q_m = Q_s \frac{T_m}{T_s} \frac{P_s}{P_m} (1 - F_{H_2O})$$

$$= \left(\frac{560}{660}\right)\left(\frac{29.8}{27.7}\right)(.90)(.055)$$

$$= (.82)(.055)$$

$$= .045 \text{ ACFM @ meter}$$

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Dual Cyclone/Filter — RUN CODE NO. 8C

OPERATOR Heuchert — DATE 6/25/75 — SAMPLING LOCATION Inlet

PORT NO. ~~West~~ E — PROBE DEPTH Traverse — STACK PRES. 29" H_2O

AMB. PRES. 27.61 — STACK TEMP. 155 — IMPACTOR TEMP. Stack

IN STACK/OUT-OF-STACK — SCALPING CYCLONE(S) —

PITOT DELTA P — GAS VELOCITY — IMP. FLOW RATE Δ, ACFM

NOZZLE DIA. #10 3/16" — IMPACTOR DELTA P. — START TIME 1005A

GAS METER END 322.970 — TOTAL SAMPLING TIME 11 min

GAS METER START 314.450 — METERING ORIFICE ΔP 5.0"

METERING ORIFICE TEMP. ≈ 90-95 — PRESS. AT METERING ORIFICE Barometric

REMARKS:

Begin preheat @ 930A.

	T	"Hg VAC	"H_2O ΔH
2		0	5
4		3	5
6		5	5
8		7	5
9		10	5
10		10	5
11		13	5

light sample

plant shutdown ≈ 1005-1010

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Dual Cyclone / Filter

RUN CODE NO. 9C

OPERATOR NEULICHT

DATE 6/25/75

SAMPLING LOCATION INLET

PORT NO. ~~W~~ E

PROBE DEPTH TRAVELP

STACK PRES. 29" H_2O

AMB. PRES. 27.61

STACK TEMP. 150 (Dial Thermometer)

IMPACTOR TEMP. STACK

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S) ✓

PITOT DELTA P

GAS VELOCITY

IMP. FLOW RATE ≈ .1 ACFM

NOZZLE DIA. #10 3/16

IMPACTOR DELTA P.

START TIME 1255

GAS METER END 334.325

TOTAL SAMPLING TIME 11 MIN

GAS METER START 325.800

METERING ORIFICE ΔP 5.0 " H_2O

METERING ORIFICE TEMP. ≈ 90°F

PRESS. AT METERING ORIFICE Barometric

REMARKS:

Begin preheat @ 1200 NOON
— process down

1210 pm calibrate pump

ΔH = 5

meter End 325.320
Begin 323.700
1.620

2 minutes → 0.81 ACFM

T	Vac "Hg	ΔH "H_2O
3	4	5.0
6	10	5.0
8	14	5.0
10	18	4.5
11	19	4.0

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Dual Cyclone/Filter

RUN CODE NO. 10C

OPERATOR Neulicht

DATE 6/25/75

SAMPLING LOCATION Inlet

PORT NO. X 5

PROBE DEPTH Traverse

STACK PRES. 29" H_2O

AMB. PRES. 27.61

STACK TEMP. ≈ 170

IMPACTOR TEMP. Stack

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S) /

PITOT DELTA P

GAS VELOCITY

IMP. FLOW RATE ≈ 1 ACFM

NOZZLE DIA. #10 3/16

IMPACTOR DELTA P.

START TIME 1650

GAS METER END

TOTAL SAMPLING TIME 11 min

GAS METER START 334.500

METERING ORIFICE ΔP 5.0" H_2O

METERING ORIFICE TEMP. ≈ 90

PRESS. AT METERING ORIFICE Barometric

REMARKS:

Begin preheat @ 1625

1653 - steam plume gone

T	Vac "Hg	ΔH "H_2O
3	0	5.0
6	4	5.0
9	8	5.0
10	9	5.0

Light stopped

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Brink

RUN CODE NO. ZB

OPERATOR Neubert

DATE 6/26/75

SAMPLING LOCATION Inlet

PORT NO. N S

PROBE DEPTH 54"

STACK PRES. 29" H_2O

AMB. PRES. 27.50

STACK TEMP. 170°

IMPACTOR TEMP. Stack

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S) —

PITOT DELTA P 3.1

GAS VELOCITY

IMP. FLOW RATE .055 ACFM 0.045 ACFM @ meter

NOZZLE DIA. 1mm

IMPACTOR DELTA P.

START TIME 0920

GAS METER END 333.650

TOTAL SAMPLING TIME 1 min

GAS METER START 333.550

METERING ORIFICE ΔP N/A

METERING ORIFICE TEMP. ≈ 80

PRESS. AT METERING ORIFICE Bar.

REMARKS:

Time	
0	START PUMP
1.0	Place in stack
2.0	Remove from stack
2.5	turn off pump

Begin Preheat @ 0900

Bad Run — foil substrates dislodged from collection plate.

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FIGURE 4

FIELD DATA

IMPACTOR IDENT. Dual Cyclone/Filter

RUN CODE NO. 11C

OPERATOR Neuleib

DATE 6/24/75

SAMPLING LOCATION Inlet

PORT NO. A S

PROBE DEPTH Traverse

STACK PRES. 29" H2O

AMB. PRES. 27.50

STACK TEMP. 180 Measured

IMPACTOR TEMP. Stack

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S) —

PITOT DELTA P

GAS VELOCITY

IMP. FLOW RATE ≈ 1 ACFM

NOZZLE DIA. #10 3/16" IMPACTOR DELTA P.

START TIME 1225

GAS METER END 351.195

TOTAL SAMPLING TIME 11 min

GAS METER START 343.300

METERING ORIFICE ΔP 5.0

METERING ORIFICE TEMP. ≈ 85-90°

PRESS. AT METERING ORIFICE Barometric

REMARKS:

Begin Preheat @ 1040A

Process down with 1 nozzle — wrong one

Begin Preheat @ 1205

T	Vac "Hg	Δ" "H2O
4	12	5.0
6	17	5.0
7	19	4.5
8	19	3.5
9	20	3.0
10	20	2.8
11	20	2.6

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Dual cyclone/Filter

RUN CODE NO. 12C

OPERATOR Neulicht

DATE 6/26/75

SAMPLING LOCATION Inlet

PORT NO. ~~West~~ E

PROBE DEPTH Traverse

STACK PRES. 29" H_2O

AMB. PRES. 27.50

STACK TEMP. 180 measured

IMPACTOR TEMP. STACK

IN STACK/OUT-OF-STACK

SCALPING CYCLONE(S) ✓

PITOT DELTA P

GAS VELOCITY

IMP. FLOW RATE ≈ 1 ACFM

NOZZLE DIA. 3/16" #10

IMPACTOR DELTA P.

START TIME 1420

GAS METER END 360.600

TOTAL SAMPLING TIME 11 min

GAS METER START 352.000

METERING ORIFICE ΔP 5" H_2O

METERING ORIFICE TEMP. 85-90°F

PRESS. AT METERING ORIFICE Barometric

REMARKS:

Begin Preheat 1340

Process down 1405.

Light Load during part of the test

T	Vac "Hg	ΔH "H_2O
4	5.0	5.0
6	5.5	5.0
8	10.0	5.0
10	11.0	5.0
11	12.0	5.0

FIGURE 4

FIELD DATA

IMPACTOR IDENT. Dual Cyclone/Filter — RUN CODE NO. 13C

OPERATOR Vehicle — DATE 6/26/75 — SAMPLING LOCATION Inlet

PORT NO. ~~North~~ S — PROBE DEPTH Traverse — STACK PRES. 29" H_2O

AMB. PRES 27.50 — STACK TEMP. 180 Measured — IMPACTOR TEMP Stack

IN STACK/OUT-OF-STACK — SCALPING CYCLONE(S) ✓

PITOT DELTA P — GAS VELOCITY — IMP. FLOW RATE ≈ 1 ACFM

NOZZLE DIA. 3/16" #10 — IMPACTOR DELTA P. — START TIME 1550

GAS METER END 369.415 — TOTAL SAMPLING TIME 11 Min

GAS METER START 360.700 — METERING ORIFICE ΔP 5.0" H_2O

METERING ORIFICE TEMP. ≈ 85-90° — PRESS. AT METERING ORIFICE Barometric

REMARKS:

Begin Preheat 1530

Sewell #7
Surface mined coal

T	"Hg Vac	"H_2O ΔH
4	5.0	5.0
6	7.0	5.0
8	9.0	5.0
10	12.0	5.0
11	12.0	5.0

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APPENDIX D

SAMPLE COLLECTION LOG

APPENDIX D

SAMPLE COLLECTION LOG

6/18/75 - Sieve Sample Collection Times for Westmoreland Coal Company, Quinwood No. 2 Preparation Plant

Samples collected by Mr. Jack Tabor

(Three sweeps used for this test per each time)

Start -	1810 to 1815	1st bag	Involves No. 7 and No. 3 collection.
	1825 to 1830		
	1855 to 1900		
	1910 to 1915		
	1925 to 1930	2nd bag	
	1940 to 1945		
	1955 to 2000		
	2010 to 2015		
	2040 to 2045		
	2110 to 2115		
	2140 to 2145		
	2200 to 2203	Stop.	

6/19/75 - Sieve Sample Collection Times for Westmoreland Coal Company, Quinwood No. 2 Preparation Plant

Samples collected by Mr. Jack Tabor

(Three sweeps used per each time for this test)

Start -	1500		Involves only No. 7 coal.
	1515		
	1530		
	1545		
	Hold		
	1615		
	1630		
	1645		
	1700		
	1730	Stop.	

6/20/75 - Sieve Sample Collection Times for Westmoreland Coal Company, Quinwood No. 2 Preparation Plant

Samples collected by Mr. Jack Tabor

(Three sweeps used per each time for the test)

Start -	0940	Involves only No. 7 coal
	0955	
	Hold	
	1100	
	1115	
	1130	
	Hold	
	1215	
	1230	
	1245	
	Hold	
	1500	
	1515	Stop.

6/23/75 - Sieve Sample Collection Times for Westmoreland Coal Company. Quinwood No. 2 Preparation Plant

Samples collected by Mr. Jack Tabor

(Three sweeps used per each time during the test)

Start -	1600	Involves only No. 7 coal
	1615	
	1630	
	1645	
	1700	
	Hold	
	1805	
	1820	
	1835	
	1850	
	1905	
	1920	Stop.

6/25/75 - Sieve Sample Collection Times for Westmoreland Coal Company, Quinwood No. 2 Preparation Plant

Samples collected by Mr. Jack Tabor

(Three sweeps used for this test per each time)

Start - 1105
1120
1135
Hold
1230
1245
1300
1315
Hold
1555
1610
1625
1640
1655
1710 Stop.

Involves No. 7 and coal collection

Scrubber Water Sample Collection Times

Date	Time
6/19/75	1530
6/20/75	Not Available
6/23/75	1840
6/25/75	Not Available .

SAMPLING TASK LOG

Plant Westmoreland
Date 6-18-75

Plant Location Rumwood W. Va.
Recorded by C. Webb

[INLET]

Comments	Run	Sampling location (Port)	Pollutant	Clock Time Began	Clock Time Ended	Elapsed Time (min)	Sample Nos.
use short nipple; points 24 - 13							
Stopped (Point 15) Process out of coal	1	EAST	Particulate	1825	1900	35	
Stop - Broken cross over tube - sampled 1.3 CF	1	EAST	Particulate	1916	1918	ND	
changed from short to long nipple for points 1-12	1	EAST	Particulate	1935	2011	36	
Probe stuck - would not move either IN or out of stack - ? points 25-36	1	SOUTH	PARTICULATE	2052	2055	3	
	1	SOUTH	Particulate	2106	2136	30	
using short nipple points 37-48	1	SOUTH	Particulate	2145	2209	24	
					TOTAL =	128	
use 2 MIN per POINT DATE 6-19-75							
points 1-12 using long nipple	2	EAST	Particulate	1357	1421	24	
points 13-24 using short nipple	2	EAST	Particulate	1430	1454	24	
points 35-48 " "	2	SOUTH	Particulate	1516	1540	24	
POINTS 25-36 using long nipple	2	SOUTH	PARTICULATE	1549	1613	24	
					TOTAL =	96	

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SAMPLING TASK LOG

Plant Westmoreland
Date 6-20-75

Plant Location Quemahoning Pa.
Recorded by P. Webb

INLET

Comments	Run	Sampling location (Port)	Pollutant	Clock Time Began	Clock Time Ended	Elapsed Time (min)	Sample Nos.
points 37-48 using short nipple	4	SOUTH	PARTICULATE	1503	1527	24	
1513 adjusted potentiometer reference temperature 82F (ambient)							
points 25-36 (long nipple)	4	SOUTH	"	1536	1600	24	
points 13-24 (short nipple)	4	EAST	"	1622	1646	24	
points 1-12 (long nipple)	4	EAST	"	1655	1719	24	
					TOTAL=	96	
6-25-75							
points 37-48 (short nipple)	5	SOUTH	"	1608	1644	36	
points 25-36 long nipple Thimble gasket leaking - observed particulate on glass filter spinning	5	SOUTH	"	1656	1732	36	
changed filter and leak checked	5	EAST		1804	1839	36	
points 13-24 (short nipple)							
points 1-12 (long nipple)	5	EAST		1907	1941	36	
					TOTAL	144	

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SAMPLING TASK LOG

Plant WESTMORELAND
Date 6-25-75

Plant Location Quinwood, W. Va.
Recorded by F. Webb

INLET

Comments	Run	Sampling location (Port)	Pollutant	Clock Time Began	Clock Time Ended	Elapsed Time (min)	Sample Nos.
STOP - wrong coal being used	6	SOUTH	PARTICULATE	1120	1138	18	
points 37-48 (short nipple)	6	"	"	1226	1244	18	
Direct reading potentiometer appears to be reading high - use milivolt pot.							
STACK TEMPERATURE QUESTIONED - use dial thermometer from plant - indicates 176F at sample port points 25-36	6	SOUTH	"	1247	1323	36	
LEAK check - probe and cracked; leak in vacuum hose replaced probe with stainless and replaced vacuum hose							
points 13-24 (short nipple)	6	EAST	"	1551	1627	36	
	6	EAST	"	1634	1710	36	
Stack gas temp checked again - dial thermometer in sample port = 198F at 1600 hrs						TOTAL = 144	
Venturi not operating 1704 hrs							

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SAMPLING TASK LOG

Plant Westmoreland Coal
Date

Plant Location Quinwood W. Va.
Recorded by Fr. Rice

Comments	Run	Sampling location (Port)	Pollutant	Clock Began	Time Ended	Elapsed Time (min)	Sample Nos.
Run stopped by I. Tonys	1	A	Part	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	
on point 15 due to black				~~[illegible]~~	~~[illegible]~~		
smoke at 18.58 ~~[illegible]~~				1812	1857	45	
Fyrite at 7:42 PM O_2 19%	1	A	"	1905	1923	18	
CO_2 0.5%							
" " 7:48 PM O_2 19.5%		B	"	2057	2203	66	
CO_2 0.5%				—	TOTAL=	129	
due to a 5" long nipple							
on the port the nozzle was							
too short to sample points							
22 & 44 ~~[illegible]~~ is originally							
plotted therefore these two							
points (22 & 44) were sampled							
at approx 1" further into the							
stack than desired							
the elbow between the filter							
& first impinger was broken							
~~[illegible]~~ while in transport between							
the samp site & clean up area							
front half of filter holder							
was also cracked but not broken							

SAMPLING TASK LOG

Plant Westmoreland Coal
Date 6-19-75

Plant Location Rainwood, W. Va.
Recorded by F.L. Rice

Comments	Run	Sampling location (Port)	Pollutant	Clock Time Began	Clock Time Ended	Elapsed Time (min)	Sample Nos.
Check valve on impinger box froze shut approx. 0.2 cubic feet of sample was taken before discovery of problem (see data sheet for exact readings)	2	Outlet A Points 1-22	Part.	14:48	15:54	66	
	2	Outlet B Points 23-41	Part.	16:14	17:11	57	
probe shorted out between A + B ports causing loss of heat to compensate imp. box temp was run at max.	2	Outlet B Points 42-44	Part.	17:27	17:36	9	
					TOTAL	132	
Fyrite on port A at 15:20							
O_2 - 20%							
CO_2 - 1.5%							
Blew pitot lines out at 16:51 during port B run							
Port B run stopped at 17:11 due to black smoke resumed at 17:27							

SAMPLING TASK LOG

Plant Westmoreland Coal
Date 6-20-75

Plant Location Glenwood, W. Va.
Recorded by F C Rice

Comments	Run	Sampling location (Port)	Pollutant	Clock Time Began	Clock Time Ended	Elapsed Time (min)	Sample Nos.
run stopped on point 8	3	Outlet A	Part.	9:40	10:04	24	
at 10:04 due to black		points 1-8				66	
smoke: resumed at 11:00	3	Outlet A	Part.	11:00	11:42	42	
pitot tubes blown out while		points 8-22					
shut down							
pitot tubes blown out	3	Outlet B	Part	12:05	12:47	42	
between pts. A & B		points 23-36				66	
leaker check after	3	Outlet B	Part.	15:04	15:28	24	
moving box to port B		points 37-					
OK				TOTAL		132	
Orsat sample taken from							
port A between 12:05 &							
12:35							
Fyrite takers at ~~point~~ port							
A $O_2 = 20\%$							
12:16 $CO_2 = 2\%$							
run stopped on point 36 at							
12:47 due to black smoke							
resumed at							
pitot tubes blown out							
while shut down							

SAMPLING TASK LOG

Plant Whitmoreland Coal
Date 6-30-75

Plant Location Quinwood, W.Va.
Recorded by E.L. Rice

Comments	Run	Sampling location (Port)	Pollutant	Clock Time Began	Clock Time Ended	Elapsed Time (min)	Sample Nos.
potentiometer calibration checked ok while shut down	3						
Traverse at port B @ time 15:14 O_2 = 20.5% CO_2 = 0.5%							
points 22 & 44 were sampled approx 1" further in the stack than originally plotted due to a 5" nipple on the sampling port.							

D-10

SAMPLING TASK LOG

Plant: Westmoreland Coal
Date: 6-23-75

Plant Location: Quinwood, W. Va.
Recorded by: Fred [illegible]

Leak check before port A OK

Comments	Run	Sampling location (Port)	Pollutant	Clock Time Began	Clock Time Ended	Elapsed Time (min)	Sample Nos.
"Orsat" sample taken at port A between 16:00 and 16:30 finished at port B at 17:30	4	Outlet A pts 1-22	Part.	15:52	16:58	66	
	4	Outlet B points 23-44	Part.	18:11	19:17	66	
					TOTAL =	132	
Fyrite taken at port A at 16:30 O_2 = 19.5% CO_2 = 1.0%							
Fyrite at port B at 18:18 O_2 = 20% CO_2 = 1.5%							
Point 22 in port A & point 44 in port B were sampled approx 1" further in the stack than originally plotted due to a 5" nipple on the port							
Leak check before point B, OK							
pitot lines were blown out between ports A & B							
calibration of potentiometer checked OK							
leak checked at end of run: OK							

SAMPLING TASK LOG

Plant Westmoreland Coal
Date ~~6-24-75~~ 6-25-75

Plant Location Dunwood, W. Va.
Recorded by Eli Rice

Comments	Run	Sampling location (Port)	Pollutant	Clock Time Began	Clock Time Ended	Elapsed Time (min)	Sample Nos.
leak check before run	5	Outlet A	Part.	11:17	11:32	15	
0.015 c f/m		points 1 - 5				66	
	5	Outlet A	Part.	12:25	13:16	51	
Orsat taken in port A		points 6 - 22					
between 11:30 and 12:40 ☆							
Fyrite on port A at 13:25 O_2=20% CO_2=1.5%	5	Outlet B	Part.	15:51	16:57	66	
Run shut down between		points 23 - 44					
points 5 & 6 due to				TOTAL		132	
plant process; shut down at 11:32							
resumed at 12:25							
Points 22 & 44 were							
sampled approx 1" further							
in the stack than originally							
plotted due to 5" nipples							
on the ports							
leak check between ports A & B ok							
pitot tubes blown out while							
down between A & B potentiometer							
zeroed between ports A & B							
Fyrite on port B at 16:00 CO_2=1.5% O_2=18.5%							
Orsat taken on port B at 13:34							
leak check at end of run ok							

☆ no orsat sampling was down while shut down

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APPENDIX E

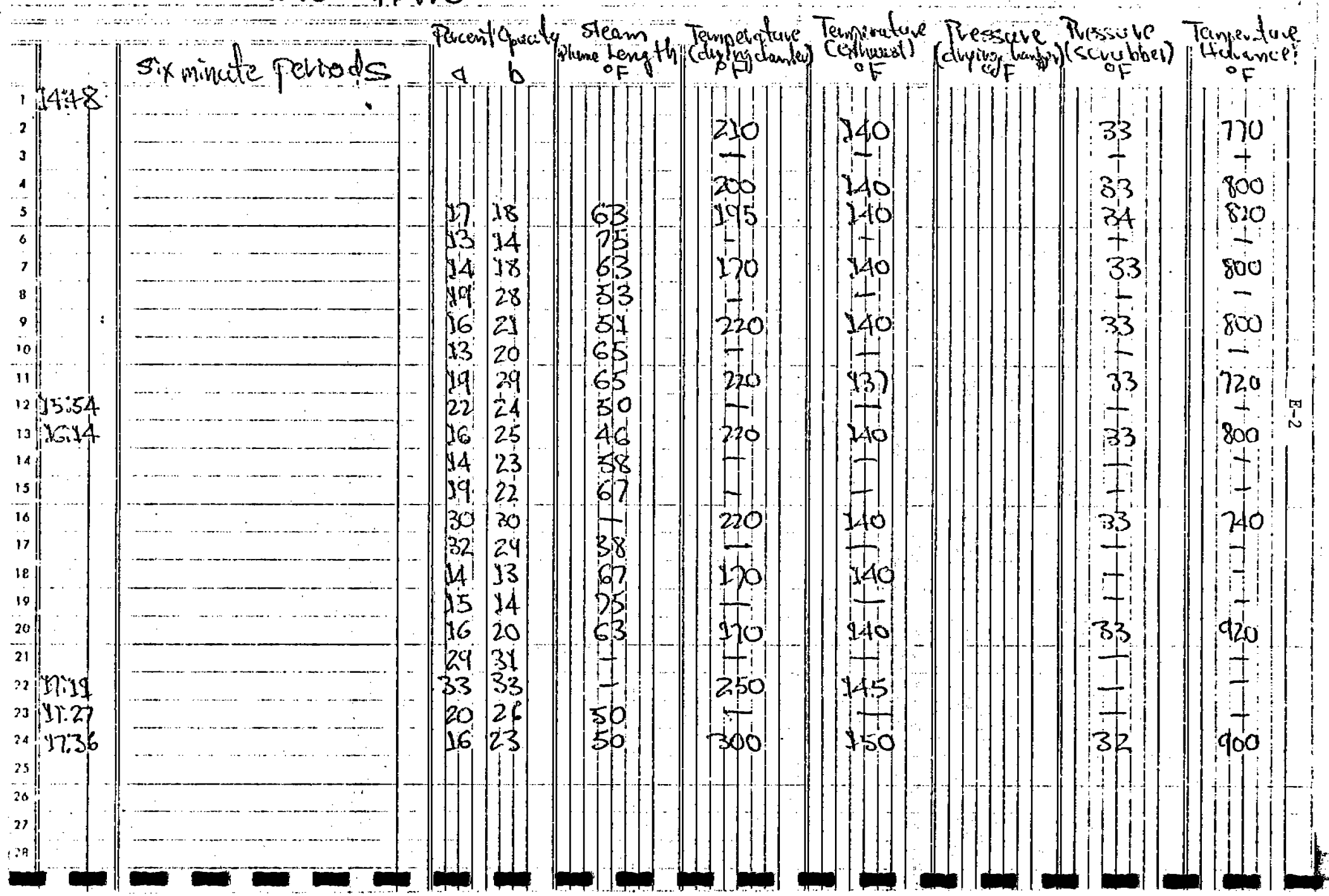
PROCESS OPERATION FIELD DATA

Test #1 June 18, 1975 Process Record

		Six minute periods	Percent Opacity a	Percent Opacity b	Steam Plume Length (ft)	Temperature (drying chamber) °F	Temperature (exhaust) °F	Pressure (drying chamber) in H_2O	Pressure (scrubber) in H_2O	Temperature (furnace) °F
1	18 12	2/3 capacity	16	20						
2			15	17		200	155		32	970
3			15	19		230	155		32	940
4			14	15	170	260	155		32	920
5		light feed	14	16	154	380	155	5.2	32	930
6			10	13	88	260	158		32	800
7			10	15	60	200	155		33	760
8		low bin - truck coal gone	6	9	67	—	—	5.2	—	—
9	18 58		5	12	75	300	180	5.8	32	780
10	19 05		—	—		195	150		32	760
11			—	—		120	155		32	920
12			—	—		250	175	5.4	32	910
13			—	—		270	155	—	32	800
14	19 25		—	—		—	—	—	—	—
15	20 57					220	155		31	1000
16						260	155		31	1000
17						255	155		32	900
18						—	—		—	—
19						—	—		—	—
20						—	—		—	—
21						220	155		32	960
22						—	—		—	—
23						—	—		—	—
24						260	155		32	1000
25	22 03					—	—		—	—
26										
27										
28										

APPENDIX E -- PROCESS OPERATION FIELD DATA

Test #2 June 19, 1975 Process Record



Test #3 June 20, 1975 Process Record

		Six minute period	Percent Opacity a	Percent Opacity b	Steam Plume Length (ft)	Temperature (drying chamber) °F	Temperature (exhaust) °F	Pressure (drying chamber) in H_2O	Pressure (scrubber) in H_2O	Temperature (furnace) °F
1	9:40	Ramps on Vib. feed	22	20	212	280	150	5.6	32	820
2			26	22	179					
3			28	21	192					
4			21	20	175	280	150	6.0	32	820
5	10:04		13	14	113	300	150	5.7	32	800
6	11:00		37	19	200	285	150	6.8	32	700
7			31	20	217					
8			34	20	238	280	145	5.6	32	780
9			36	21	204					
10			33	21	200	300	150	5.8	33	800
11			37	25	200					
12			33	22	200	290	150	5.6	32	780
13	11:42		30	26	200					
14	12:05		21	23	200	230	145	5.4	32	700
15			22	23	200					
16		14 amps vib. feed	31	25	200	220	145	5.8	33	780
17			34	24	200	255	155	5.6	32	800
18			38	20	196	260	155	6.0	32	820
19			36	20	158	270	155	5.6	32	800
20			32	16	125					
21	12:47	high filter cake	15	22	71	320	155	5.0	32	840
22	13:04		15	27	58	240	150	5.4	33	840
23			14	20	25					
24			15	18	60	255	150	5.2	33	820
25	15:28									
26										
27										
28										

Test #4 June 23, 1975 Process Record

			Percent Opacity		Steam Plume Length (Ft)	Temperature (drying chamber) °F	Temperature (exhaust) °F	Pressure (drying chamber) in H_2O	Pressure (scrubber) in H_2O	Temperature (feed mix) °F
		Six minute periods	a	b						
1	15:52	13.75 amps vib. feed	16	15	129	220	155	5.5	32	920
2			13	15	125					
3		13.50 amps vib. feed high fines	10	14	125	220	155	5.5	32	920
4			10	14	142	230	155	5.8	32	920
5			10	16	146	250	155	5.3	32	900
6			12	18	146					
7			10	16	150	230	155	5.4	32	880
8			12	14	233					
9			11	14	188					
10			11	8	229	240	155	5.4	32	
11			9	6	192					
12	16:52		10	7	175	240	155	5.4	32	920
13	18:31		10	10	200	240	155	5.6	32	940
14			10	10	200	230	155	5.6	32	940
15			10	11	175					
16			10	12	154					
17			10	12	150	230	155	5.6	32	940
18			13	13	142					
19			15	18	125					
20		heavy load	15	20	125	220	155	6.0	32	940
21			15	16	125					
22			15	15	104	280	155	5.8	32	940
23			12	15	108	250	155	5.8	32	940
24	19:17		10	13	175	250	155	6.0	32	940
25										
26										
27										
28										

Test #5 June 25, 1975 Process Record

		Six minute periods	Percent Opacity a	Percent Opacity b	Steam Plume length (ft)	Temperature (drying chamber) °F	Temperature (exhaust) °F	Pressure (drying chamber) in H_2O	Pressure (scrubber) in H_2O	Temperature (Farrdence) °F
1	11:17	13.6 amps vib. feed	13	15	75	280	152	5.6	33	860
2			15	20	75	270	152	5.6	33	860
3	11:32	light load	16	24	43	255	155	4.8	33	810
4	12:25		21	27	30	230	155	5.2	33	850
5			13	20	50	270	152	5.0	33	800
6			18	22	80	260	150	5.4	33	800
7			24	26	63	260	155	5.8	33	850
8		13.4 amps vib. feed	22	25	74	280	152	5.2	33	810
9			21	24	71					
10			24	24	63	270	150	5.6	33	810
11	13:16		23	25	80	250	152	5.8	33	810
12	15:51		11	12	125	235	160	6.8	31	980
13		heavy load	11	13	125					
14			11	14	113	240	160	6.6	32	980
15			10	14	96					
16			10	14	88	250	160	6.4	32	960
17			11	15	92					
18		very heavy load	11	15	88	250	160	7.0	32	960
19			12	16	75					
20			12	15	71					
21			11	14	75	230	160	6.5	32	960
22			12	14	63	280	165	5.7	33	780
23	16:57		15	23	50	290	162	5.8	33	760
24										
25										
26										
27										
28										
29										

APPENDIX F

SAMPLE IDENTIFICATION LOG

APPENDIX F -- SAMPLE IDENTIFICATION LOG

Particulate samples collected on outlet side, Method 5

Westmoreland Coal Co.
Quinwood, W. Virginia
Coal Cleaning Plant

SAMPLE LOG IDENTIFICATION

June 1975

EPA No.	Date	Sample Discription	Run No.	Remarks
S-75-001-				
411	6/18	Glass fiber filter	QNC-1	
412		Acetone ,probe rinse	"	
413		Impinger water+rinse	"	
414		Chloro/Ether Ext.	"	
415		Final acetone rinse	"	
416	6/19	Glass fiber filter	QNC-2	2 filters
417		Acetone, probe rinse	"	contains~10 ml condensate
418		Impinger water+rinse	"	filter leaked, dust in 1st imp.
419		Chloro/Ether Ext.	"	
420		Fin. Acet. rins, back	"	
431	6/20	Glass fiber filter	QNC-3	2 filters
432		Acetone probe rinse		
433		Imping. water + rinse		
434		Chloro/Ether Ext.		
435		Fin. acet rins, back		
441	6/23	Glass fiber filter	QNC-4	2 filters
442		Acetone probe rinse	"	
443		Impinger water + rinse		
444		Chloro/Ether Ext.		
445		Final acetone rinse		
451	6/25	Glass fiber filter	QNC-5	2 filters
452		Acetone proberinse		
453		Impinger water + rinse		
454		Chloro/Ether Ext.		
455		Final acetone rinse		

Clean-up Background
Evaluation Samples

SAMPLE LOG
IDENTIFICATION

Westmoreland Coal Co.
Quinwood, W. Virginia
Coal Cleaning Plant
June 1975

EPA No. S-75-001-	Date	Sample Discription	Run No.	Remarks
-401	6/17	Glass fiber filter	EBK-1	Glassware clean-up before
402	"	Acet. rinse, probe	"	Run No. QNC-1,
403	"	Impinger Water+rinse	"	Glass ware set No. 1
404	"	Chloro/Ether Extof 3	"	
405	"	Final Acetone rinse	"	
406	6/17	Glass fiber filter	EBK-2	Glassware clean-up before
407	"	Acetone rinse,probe	"	Run No. QNC-2,
408	"	Impinger H_2O+rinse	"	Glass ware set No. 2
409	"	Chloro/Ether Ext.	"	
410	"	Final Acetone rinse	"	
421	6/18	Glass fiber filter	EBK-3	Clean-up after Run # QNC-1
422		Acetone probe rinse	"	
423		Impinger H_2O+rinse	"	
424		Chloro/Ether Ext.	"	
425		Final Acetone rinse	"	
426	6/19	Glass fiber filter	EBK-4	Clean-up after Run# QNC-2
427		Acetone probe rinse	"	
428		Impinger H_2O+rinse	"	
429		Chloro/Ether Ext.	"	
430		Final Acetone rinse	"	
436	6/20	Glass fiber filter	EBK-5	Clean-up after Run # QNC-3
437		Acetone probe wash	"	
438		Imping water+ rinse	"	
439		Chloro/Ether Ext.	"	
440		Final Acetone rinse	"	

Clean-up Background,
Evaluation Samples

SAMPLE LOG
IDENTIFICATION

Westmoreland Coal Co.
Quinwood, W. Virginia
Coal Cleaning Plant
June 1975

EPA No. S-75-001-	Date	Sample Description	Run No.	Remarks
446	6/23	Glass fiber filter	ESK-6	Clean-up after Run # QNC-4
447		Acetone, probe rinse		
448		Impinger water,rins		
449		Chloro/Ether Ext.		
450		Final acetone rinse		
		BLANKS		
493	6/25	Glass fiber filter BLANKS 3 ea.		
494		200 ml Acetone blank	Burdick & Jackson distilled in glass,	
495			Lot No. 7150	
		200 ml distilled water BLANK	OSU prepared by OSU	
496		Chloroform + Ether BLANK		

Grab samples of dryer feed, scrubber water, & process material

SAMPLE LOG IDENTIFICATION

Westmoreland Coal Co.
Quinwood, W. Virginia
Coal Cleaning Plant
June, 1975

EPA No.	Date	Sample Discription	Run No.	Remarks
S-75-001-				
553	6/18	Dryer feed (4 btls.)		Collected 1800 to2200, total wt. 2.36 Kg
	6/19	Coal feed to dryer		Total sample discarded
563	6/20	Coal feed to dryer		
564	6/23	Coal feed to dryer		Pochantus # 3 (2 x 1 gal)
565	6/19	Return water from demister		
566	6/20	Return water frome demister		
581	6/23	Return water from demister		
582	6/25	Return water from demister		
583	6/23	Coal feed to dryer, (2 x 1 gal)		blend of Pocahontis and Sewell # strip
584	6/23	ditto- to be used for trial run.		duplicate

APPENDIX G

CYCLONE SAMPLE LOG AND ANALYTICAL RESULTS

APPENDIX G -- CYCLONE SAMPLE LOG AND ANALYTICAL RESULTS

Westmoreland Coal Co.
Quinwood, W. Virginia
Coal Cloaning Plant

SAMPLE LOG

EPA No.	DateSample	Discription	Run No.	Remarks
8-75-007-				
456		Filter	1B	0.0000
457		Cyclone	1B	0.0124
458		#1 cyclone	2C	0.3147
459		cyclone + Filter catch	2C	0.0202
460		Filter	2C	0.0620
461		#1 cyclone	3C	1.7575
462		Filter	3C	0.1144
463		#1 cyclone	4C	3.9237
464		Filter	4C	0.1266
465		#1 cyclone	5C	3.6606
466		#2 cyclone	5C	2.2320
467		Filter	5C	0.0229
468		Filter WASH	5C	0.0085
469		#1 cyclone	6C	1.3006
470		#2 cyclone	6C	0.1659
471		#1 cyclone	7C	1.1888
472		#2 cyclone	7C	0.1346
473		Filter	7C	0.0450
474		Filter WASH	7C	.0073
475		#1 cyclone	8C	0.5013
476		#2 cyclone	8C	0.0535
477		Filter	8C	0.0278
478		Filter WASH	8C	0.0048
479		#1 cyclone	9C	1.2658
480		#2 cyclone	9C	0.1166
481		Filter	9C	.0383
482		#1 cyclone WASH	9C	0.0060
483		#2 cyclone WASH	9C	0.0076
484		Filter WASH	9C	0.0048
485		#1 cyclone	10C	0.6590
486		#2 cyclone	10C	0.0752

Westmoreland Coal Co.
Quinwood, W. Virginia
Coal Cleaning Plant

SAMPLE LOG
IDENTIFICATION

EPA No. S-75-001-	Date	Sample Description	Run No.	Remarks grams
487		F. Iter	10C	0.0234
488		#1 cyclone WASH	10C	0.0035
489		#2 cyclone WASH	10C	0.0062
490		Filter WASH	10C	0.0040
491		Acetone BLANK	1B-9C	0.0002 /100 ML
492		Acetone BLANK	10C-	0.0004 /100 ML
498		#1 cyclone	11C	1.6196
499		#2 cyclone	11C	0.2217
500		Filter	11C	0.1090
591		Acetone WASH #1 cycl	11C	0.0081
592		#2 cyclone WASH	11C	0.0089
593		Filter WASH	11C	0.0086
594		#1 cyclone	12C	1.0512
595		#2 cyclone	12C	0.1151
596		Filter	12C	0.0000
597		#1 cyclone WASH	12C	0.0059
598		#2 cyclone WASH	12C	0.0172
599		Filter WASH	12C	[redacted] .0070
600 S-74000 474		#1 cyclone	13C	0.5947
475		#2 cyclone	13C	0.0771
476		Filter	13C	0.0386
477		#1 cyclone WASH	13C	0.0048
478		#2 cyclone WASH	13C	0.0098
		Filter WASH	13C	0.0028

APPENDIX H

DIAGRAM OF SAMPLE EQUIPMENT SERIES CYCLONES INCLUDING CALIBRATION DATA

APPENDIX H

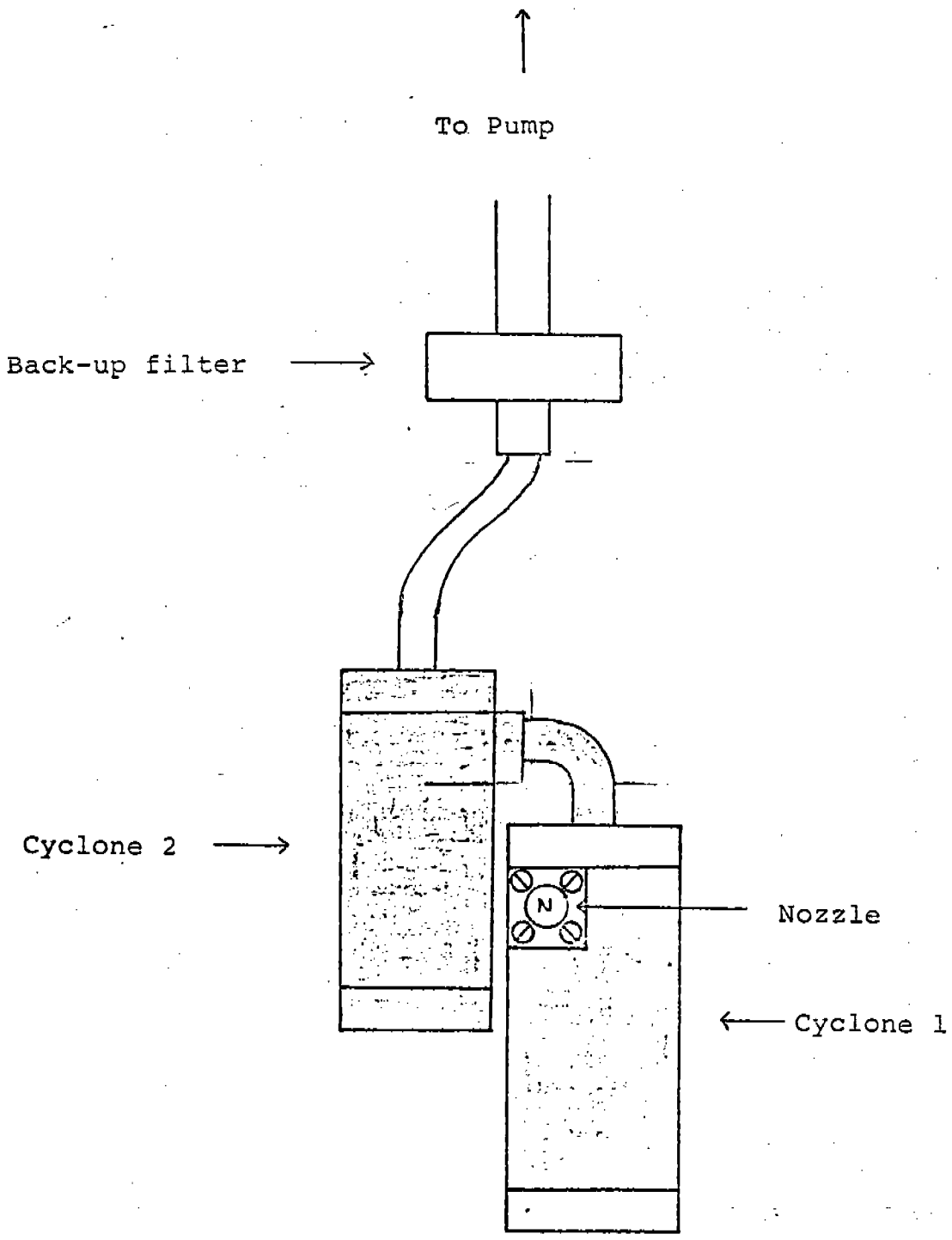


FIGURE H-1. SERIES CYCLONE SAMPLING APPARATUS BLOCK DIAGRAM

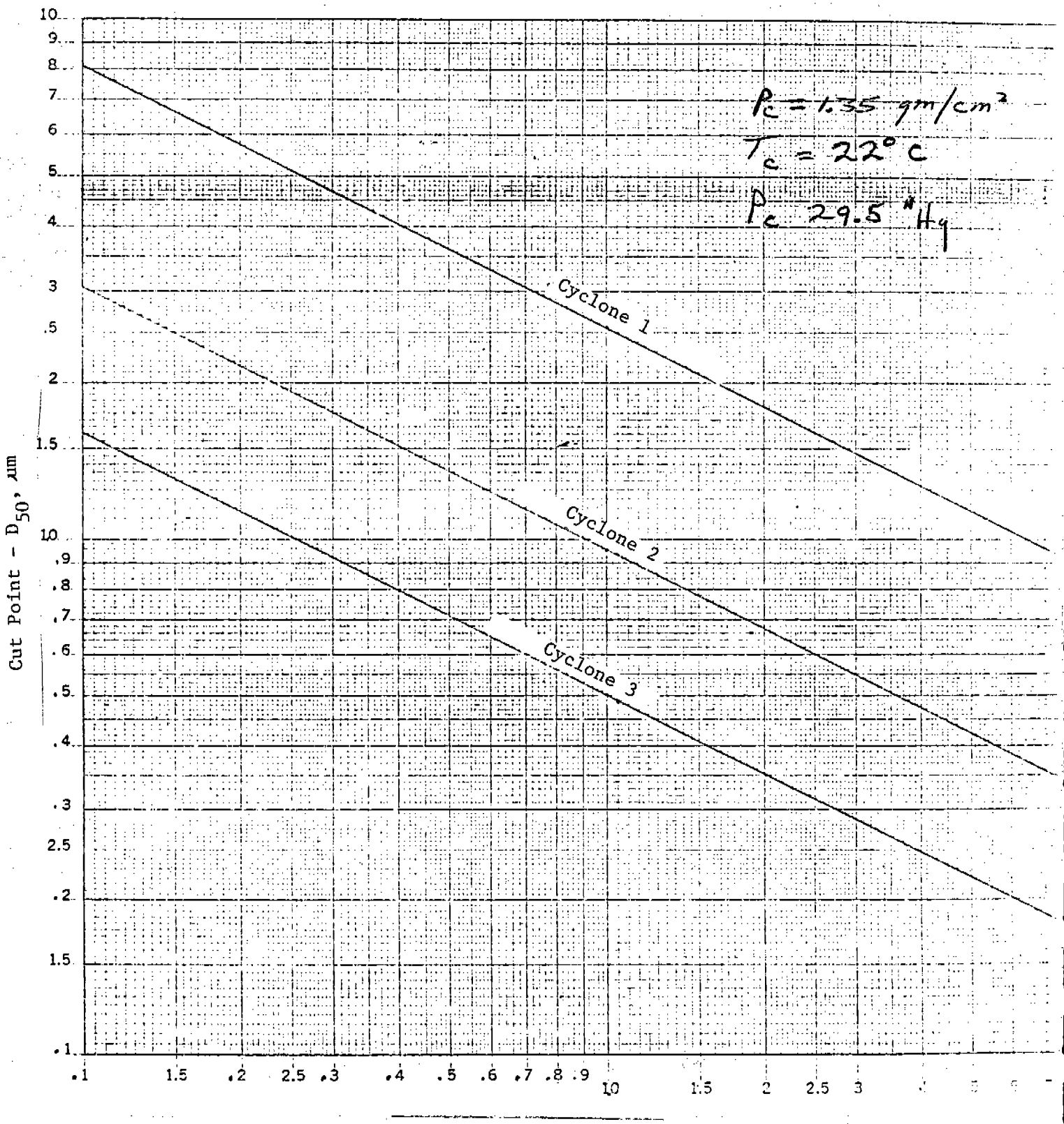


FIGURE H-2. CUT OFF POINT VERSUS FLOW RATE CALIBRATION CURVES FOR EPA SERIES CYCLONE

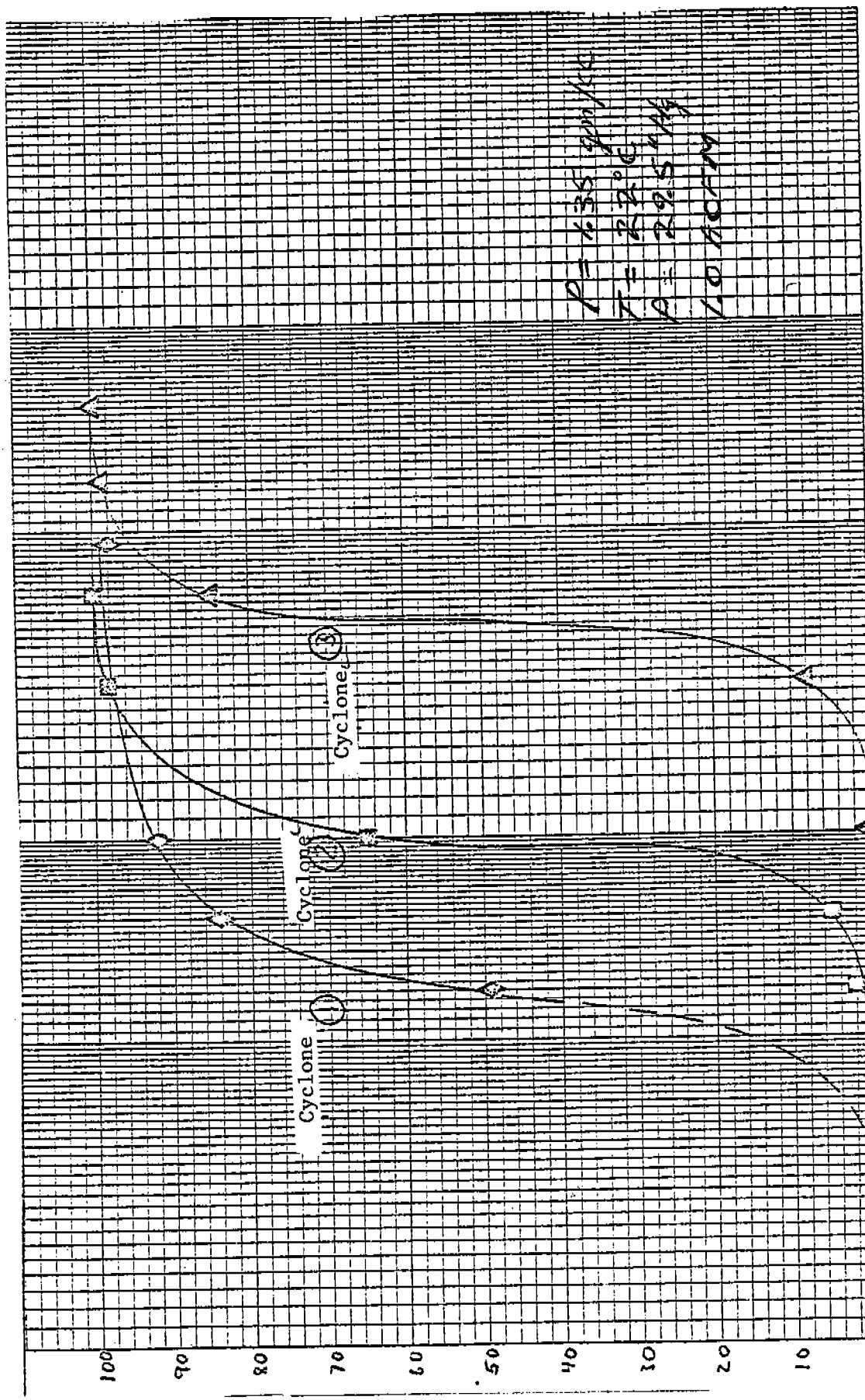


FIGURE H-3. CYCLONE COLLECTION EFFICIENCY CALIBRATION DATA

APPENDIX I

DETAILED STANDARD SAMPLING AND ANALYTICAL PROCEDURES

APPENDIX I

DETAILED STANDARD SAMPLING AND ANALYTICAL PROCEDURES

The sampling procedures described in the December 23, 1971, issue of the Federal Register, Methods 1, 2, 3, and 5, have been used as a reference for the source emission measurements conducted at Westmoreland Coal Company, Quniwood, West Virginia.

For scrubber inlet sampling, an Alundum thimble was added to the standard Method 5 sampling train. This thimble was located between the nozzle and the probe (as shown in Figure 16) and was inside the stack during sampling.

Sample-port location, for the most part, is determined from stack geometry so that representative samples may be obtained for determining particulate emissions. Any restrictions or alterations in the stack gas flow must be considered. (Stack sampling locations are given in the main body of this report.)

After selecting the appropriate stack sampling location, number, and position of sampling points as described in Method 1, a preliminary traverse of the stack was completed to determine the average ΔP and average gas temperature. These data were then used, with the aid of a nomograph, to determine the appropriate nozzle diameter which would allow for isokinetic sampling at an air flow rate consistent with proper sampling train operation.

The sample trains were prepared for operation as outlined in Method 5. The glass filters and Alundum thimbles used for particulate collection were desiccated for 24 hours and the tare weight determined.

During the sampling period, isokinetic flow was maintained by adjusting the sampling flow rate to compensate for stack ΔP and temperature variations. Field data for all runs are presented in Appendix C.

After the completion of each test and the recording of the appropriate field data, the inlet and outlet sampling trains were removed from their respective platforms and taken to the temporary field laboratory. The probe assembly was removed from the sampling train; the ends were plugged and the probe allowed to cool. The Pyrex tube and stainless

steel nozzle were then thoroughly cleaned with a nylon brush and rinsed with reagent-grade acetone into a precleaned screw-cap glass container.

The glass filter used at the outlet location was removed from its holder and placed into a desiccator for drying. Mass values were determined after 24 hours.

The side of the glass filter holder facing the probe was rinsed with reagent-grade acetone and emptied into the probe-acetone-wash container. The weight of acetone and wash residue (after drying) and the net filter weight comprise the total mass of the collected sample. The weight increase of Drierite in the fourth impinger plus the net condensed liquid in the first three impingers was used to determine the stack gas moisture content.

Samples of the acetone used to clean the glassware were taken from each container that was used in the field to determine the amount of residue from blank acetone.

Cyclone catches (collected by EPA) were desiccated and mass values determined after 24 hours.

Special handling of the inlet thimble catch was necessary in that particle-size distribution was to be made on the particulate. After removing the thimble from its holder and a mass value determined, the thimble and contents were placed in a plastic bag and sealed. Agglomeration during routine drying could possible alter the size distribution, therefore, the thimble catch was not desiccated. The thimble and special EPA multiple-cyclone catches were returned to Battelle-Columbus for an extensive laboratory study to determine factors, if any, which could alter or influence the particle-size data. The results of this study and the techniques used to obtain sample aliquots are reported in the body of the report.

In summary, the techniques described in the body of the report which have been used to evaluate various aspects of particle sizing methodology, essentially indicate that routine techniques, when using a Coulter Counter[1], can be employed when determining particle-size data from coal samples. For this study the wetting agent used was TRITON X100 and the electrolyte was 4 percent sodium chloride.

The Mine Safety Appliance particle size analyzer[2] used for sizing the <325 mesh bulk coal samples employed an isopropyl alcohol for the sedimentation liquid and a proportion of 50 percent isopropyl; 50 percent heptane for the feed liquid (See this Appendix for information relating to the theory of operation of the Coulter Counter and the MSA particle size analyzer).

Visible emissions data were determined by two certified observers using EPA Method 9[5] as a guide. All pertinent data, as required, were recorded and is contained in Appendix C. For the most part, an attached steam plume was present during the visible emission readings. As described in EPA Method 9[5], paragraph 2.3.1, the opacity observations were made beyond the point in the plume where water vapor was no longer visible. Pertinent data, regarding distances from the stack exit to the observation point are recorded on the field data forms, Appendix C, and also in the body of the report.

There were short periods of time when only one observer was reading visible emissions, therefore, during those time periods, the computer data summary (B-1 and B-2) reflect averages which are low by a factor of two. However, the data plots which relate the time of day to percent opacity (Figures 11-15) show the average data of the two observers, or where pertinent, the data when one observer was reading.

PARTICLE SIZE ANALYSIS

by

MINE SAFETY APPLIANCE PARTICLE SIZE ANALYZER

Importance of Particle Size Analysis

As industrial development and competition continues at a rapid pace, particle technology problems have also multiplied. Most of the time it is found that particle size distribution measurement provides the key to a scientific solution.

In spite of a long felt need for satisfactory size analyzers and the development of a great diversity of instruments and techniques, no single instrument has been developed which has sufficient accuracy, convenience of operation and flexibility to truly be called a universal size analyzer. The resulting lack of standardization has lead to endless confusion and misapplication of good, but limited, techniques. Therefore, the reason for design and development of the MSA Particle Size Analyzer can best be appreciated by discussing briefly the size analysis problem along with the important analytical methods.

The Particle Size Analysis Problem

Particles of industrial and scientific importance range from the coarse sand or gravel size down to submicroscopic size. The measurement of sieve size particles (above 200 mesh or 74 microns) does not present much of a problem. It is the subsieve particles between approximately 0.1 and 40 microns which represent the greatest problem. Most airborne dusts, paint pigments, and many flours, chemicals, pharmaceuticals, etc. lie within this size range. Measurement in this range is difficult for several reasons:

First, is the fact that the relatively broad size distributions of most powders of interest makes it practically impossible to make an accurate conversion of microscope count size analysis to the weight distributions that are usually desired.

Secondly, most powders contain just enough submicron particles so that the limit of resolution of the light microscope, the slowness of gravity sedimentation and the deaggregation problems of the elutriation methods make these methods relatively unsatisfactory in the submicron range. On the other hand, all centrifuge methods cannot analyze powders containing particles above 5 microns.

The characteristics of the most important size analysis methods are varied and frequently conflicting in results.

The MSA Particle Size Analyzer

It can be seen that the MSA Particle Size Analyzer strikes perhaps the best compromise between range, accuracy, speed, cost and utility of any instrument available at present. The instrument embodies the research and experience of a number of large industrial firms as well as the University of Minnesota where the original development took place.

It has been used successfully to measure the size distributions of practically every powdered material of industrial importance. It is also being used for the size analysis of less than milligram quantities of airborne dusts sampled by impinging or filtering through high efficiency media.

Because of its speed and convenience it is perhaps the only available instrument, at present, suited for quality control purposes in the submicron size ranges.

Principles of Operation

In common with all sedimentation size analysis methods, this instrument utilizes the relationship between particle settling velocity and particle size known, derived from Stoke's law.

For gravity this is:

Equation I

$$t = \frac{18.37 \times 10^8 \, u_o h}{(p - p_o) \, g \, d^2}$$

where t = time in sec. to settle a distance h in cm.
u_o = absolute viscosity-poise
p = particle density — gm/cm
p_o = Sedimentation liquid density—gm/cm
d = particle size — micron
g = gravitational constant = 980 cm/sec

From Equation I it is seen that the time to settle a given distance is inversely proportional to the square of the particle size and a function of the viscosity and of particle and liquid density. Because it requires about 24 hours for a 1 micron particle of 2.7 gm/cc density to settle 10 cm. in water, centrifugal force is required to reduce the settling time of submicron particles to a reasonable value. This is why the MSA Particle Size Analyzer utilizes both gravity settling for the coarse particles and centrifugation for the fine.

The settling rate of the particles can be sensed in a variety of ways. This method utilizes a special centrifuge tube with a small capillary at the bottom. The particle size distribution is calculated from the ratio of the observed sediment height in the capillary at times corresponding to the desired particle sizes; to the height after all particles have settled. Though simple, this method sensing, in combination with the sedimentation from a layer, makes it possible to use centrifuges having short radii, without increasing the complexity of calculation.

Outline of Procedure

The basic procedure is illustrated in Figure 1 and is described therein:

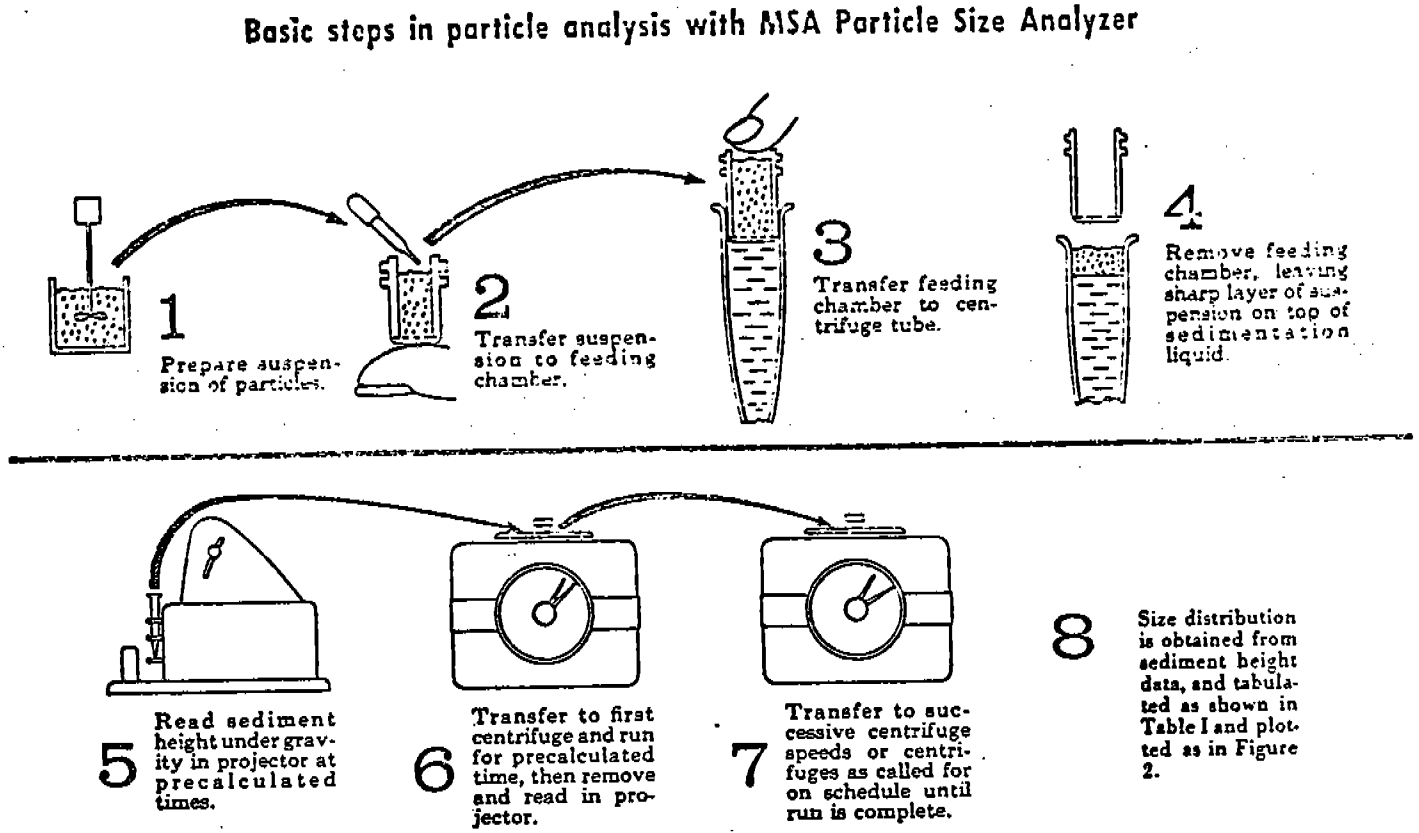


Figure 1

The complete instrument includes centrifuge tubes, feeding chamber, an optical tube projector, one or more special centrifuges and tube handling and cleaning accessories. To provide the greatest flexibility at the lowest cost consistent with the requirements of each application, the major components, such as projector and centrifuges, have been designed as separate units. The method may be established with a minimum investment and then expanded by the addition of additional centrifuges, etc. Below are described the different units available and the combinations recommended for such applications.

Measuring rods are useful for rapidly measuring out enough powder for a run when the disperation of the of the powder is performed in the feeding chamber. The scoop provided will be approximately correct for most materials, but different hole volumes may be required for materials of different bulk densities.

For the analysis of some fine powders and for the analysis of atmospheric dust samples, it is desirable to have available a commercial high speed centrifuge. This is used for concentrating dilute suspensions of particles and for determining size distribution and points.

Centrifuges

To meet the critical requirements of size analysis methods, four special centrifuges (300, 600-1200, 1800 and 3600 r.p.m.) have been designed. These centrifuges have the following special features:

1. Constant speed obtained by use of a high quality hysteresis type synchronous motor.
2. Stable starting and stopping characteristics having a maximum rate of acceleration of 5 radians per sec. This is obtained by the correct combination of inertia, starting current, aerodynamic resistance and friction introduced by an electromagnetic brake.
3. Ability to be stopped and started by an interval timer without manual adjustment of any speed control device.
4. Reliability resulting from simple rugged design and absence of electronic controls.

A voltage regulator may also be used so that starting and stopping calibrations are maintained. This should be a constant voltage transformer with an output of 250VA, A.C.

Variable resistors are provided for adjusting the starting time of the centrifuge. The procedure for checking and adjusting the acceleration is discussed in the maintenance section of this manual.

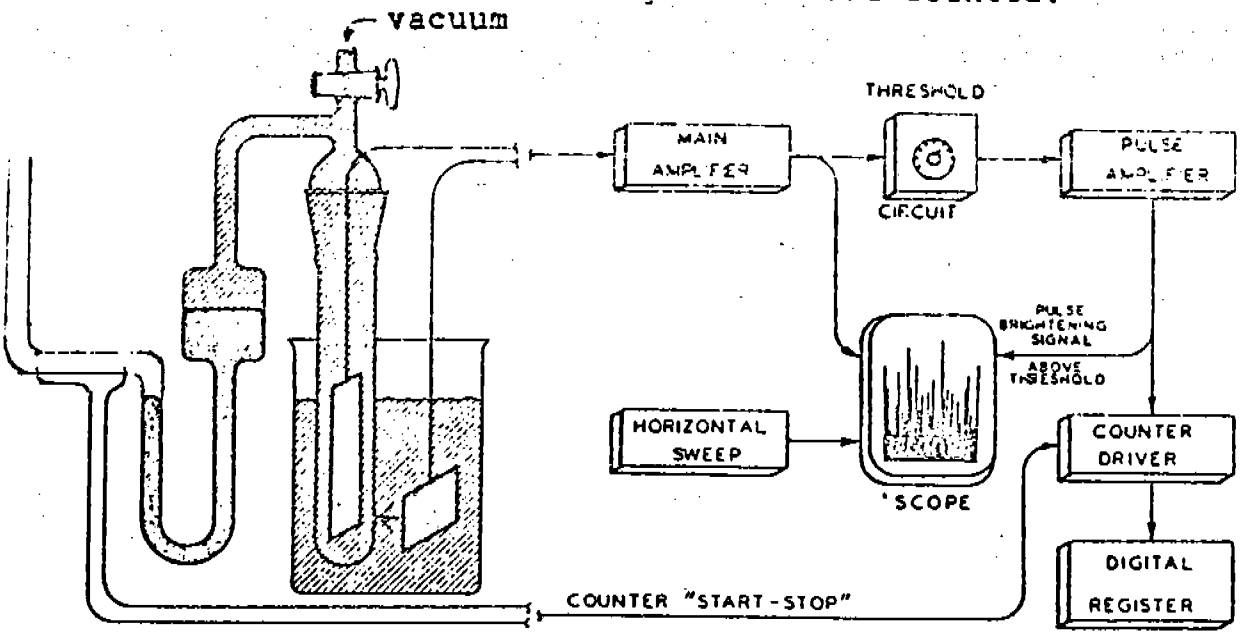
PARTICLE SIZE ANALYSIS

by

MODEL "B" COULTER COUNTER

1. The Coulter Counter determines the number and size of particles suspended in an electrically conductive liquid. This is done by forcing the suspension to flow through a small aperture having an immersed electrode on either side.

2. As a particle passes through the aperture, it changes the resistance between the electrodes. This produces a voltage pulse of short duration having a magnitude proportional to particle volume. The series of pulses is then electronically scaled and counted.



3. When the vacuum stopcock is opened, a controlled external vacuum initiates flow from the beaker through aperture and unbalances the mercury siphon. Closing the stopcock then isolates the system from the external vacuum, and the siphoning action of the mercury continues the sample flow.

4. The advancing mercury column makes contact with start and stop probes to activate the electronic counter. The probes are placed precisely 50, 500, or 2000 microliters apart, providing a constant sample volume for all counts.

5. The voltage pulses are amplified and fed to a threshold circuit having an adjustable threshold level. If this level is reached or exceeded by a pulse, the pulse is counted. The threshold level is indicated on an oscilloscope screen by a brightening of the pulse segments above the threshold, facilitating the selection of appropriate counting levels.

6. By taking a series of counts at selected threshold levels, data are directly obtained for plotting cumulative frequency (larger than stated size) versus particle size. Integration of all or part of the resultant curve provides a measure of the particle content of the suspension.

7. Before plotting, the counts are first corrected for coincident particle passages (doublets, triplets, etc.). These corrections are quite precise, and if kept to a moderate level (say, 5 or 10 percent), the overall accuracy of measurement of particles becomes a function of the number counted. The large numbers of particles counted (tens of thousands), provides low statistical deviation.

8. The pulse height and instrument response are essentially proportional to particle volume, and to fluid resistivity for particles up to 30 or 40 percent of the aperture diameter. The particle resistivity has very little or no effect.

9. The principle does not permit significant discernment of particle shape, and results are expressed in spherical equivalents. This proves to be valid, as sufficiently high numbers of particles are counted to assure an averaging of orientations of particles traversing the aperture.

10. In the main, the theoretical bases of the Coulter Counter are quite simple, and "side effects" are notably few in number and small in their influence on the results. The accuracy of the measurements is not limited by the instrument, but is simply a matter of the degree of care exercised in its use.

11. The instrument is inherently simple to calibrate.

APPENDIX J

PROJECT PARTICIPANTS AND TITLES

APPENDIX J

PROJECT PARTICIPANTS AND TITLES

Field Team

Paul R. Webb, Senior Technologist (Team Leader)
William C. Baytos, Scientist
Donald Hupp, Technician
Justin McNulty, Chemist
J. Mason Pilcher, Mechanical Engineer
Fred L. Rice, Technician
Ronald E. Snyder, Biologist
James J. Tabor, Technician
Karl W. Turner, Technician
David A. Trayser, Mechanical Engineer

Administrative and Technical Support

Richard E. Barrett, Program Manager and Associate Section Manager
Stephen D. Ban, Section Manager
James A. Gieseke, Research Leader

APPENDIX K

TEST LOG

APPENDIX K

TEST LOG

June 16, 1975	Transport equipment to test site area.
June 17, 1975	Arrive at test site Set up field lab, sampling equipment at outlet Run velocity traverses at inlet and outlet Redesign inlet sampling ports.
June 18, 1975	Complete inlet sampling setup Rerun velocity traverse at outlet with new straightening vanes Particulate runs QNC-1 and TH-1 Dryer feed sample.
June 19, 1975	Particulate runs QNC-2 and TH-2 Dryer feed sample Scrubber water sample.
June 20, 1975	Particulate runs QNC-3 and TH-4 (Run TH-3 aborted) Dryer feed sample Scrubber water sample.
June 23, 1975	Particulate runs QNC-4 and TH-5 Dryer feed sample Scrubber water sample.
June 24, 1975	No sampling due to plant operational problems.
June 25, 1975	Particulate runs QNC-5 and TH-6 Dryer feed sample Scrubber water sample
June 26, 1975	Remove and pack field lab and sampling equipment Transport to Columbus.