

Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

PARTICULATE EMISSION TESTING

BAGHOUSE EXHAUST

BLYTHE INDUSTRIES

Hendersonville, N. C.

May 10, 1988

Test Report #4795

REPORT
of
PARTICULATE EMISSION TESTING
on the
BAGHOUSE EXHAUST
at
BLYTHE INDUSTRIES
in
HENDERSONVILLE, N. C.
on
MAY 10, 1988
TEST REPORT #4795

ANALYTICAL TESTING CONSULTANTS, INC.
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cc

Issue Dates:
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INTRODUCTION

This report presents the results of particulate emission testing performed on the baghouse exhaust at Blythe Industries, Inc. in Hendersonville, N. C.

The purpose of this test was to determine compliance with applicable emission rate codes of the state of North Carolina.

The test was conducted by ANALYTICAL TESTING CONSULTANTS, INC. Kannapolis, N. C. Members of the test team were Dan McCombs, Keith Poole, and Richard Westbrook.

SOURCE DESCRIPTION

The system tested was the exhaust of a bag collector. The baghouse is utilized for control of particulate emissions from the asphalt plant's drying kiln.

RESULTS SUMMARY

SYSTEM Blythe Industries

TEST DATE May 10, 1988

PARAMETER	RUN #1	RUN #2	RUN #3	AVERAGE
Qs, FLOW, ACFM	42432	49897	46131	46153
Qs dry, FLOW SCFM	24401	27363	26340	26035
Vm std, CUBIC FT.	34.66	36.71	35.85	
%I	106.7	100.8	102.3	
PMR AVG, LB/HR	7.5	6.7	6.8	6.9
Cs, GR/SCF	.0348	.0285	.0303	.0312
ALLOWABLE				.04

RESULTS, CONCLUSIONS AND COMMENTS

Results of the particulate emission testing are presented in the preceding Test Summary. Additional information may be reviewed in the Calculations and Data Sheets sections of this report.

The average particulate emission concentration for this testing was .0312 GR/SCFD which falls well below the NSPS of .04 for asphalt plant emissions. It should be noted that the .0312 GR/SCFD includes matter collected in the water impingers during the sampling. This material would include condensible organic matter not collected in the baghouse or on other portions of the particulate sampling system.

The visible emission observations are included in the DATA SHEETS section of this report. This data indicates that violation of the NSPS of 20% opacity is occurring. This condition apparently occurs whenever this type asphalt is manufactured. Visible emissions are reported to be much lower when other products are produced. Since this occurs only on this product, which is unique by the requirements of the N. C. paving contract, we recommend that Blythe apply for a variance on the 20% opacity regulation while manufacturing this product.

Since the previous testing, an 8' stack extension has been added between the blower and sampling ports. This extension has significantly changed the air flow profile as measured at the sampling ports, and as a result, much improved data was obtained.

SAMPLING AND ANALYTICAL PROCEDURES

Particulate testing and analysis were performed according to procedures developed by the U. S. Environmental Protection Agency (EPA) and referred to as Method 5. Sampling port locations and number of test points to be used were determined according to Method 1. The above federal test methods appear in the Code of Federal Regulations (Reference 1).

Test point locations and sampling port placement for velocity traverses are shown in the data sheets. Test point locations were calculated based upon 5 ports located on a 4' X 4' stack.

Gas sampling was performed in accordance with EPA Method 3.

REFERENCES

1. CODE OF FEDERAL REGULATIONS, Title 40, Part 60, Appendix A, July 1, 1986.

CALCULATIONS

Particulate Emission Rate Calculation
Square Root of DP
Nomenclature
Calculation Formulae

PARTICULATE EMISSION RATE CALCULATION

DATA/CALCULATION	RUN 1	RUN 2	RUN 3	AVERAGE
DATE	5/10/88	5/10/88	5/10/88	
AVG DH (IN H2O)	1.13	1.29	1.18	
P ATM (IN HG)	28.6	28.6	28.6	
PM (IN HG)	28.68308	28.69485	28.68676	
PS (GAUGE)	0.32	0.32	0.32	
PS (IN HG)	28.62352	28.62352	28.62352	
tM (DEG F)	99	118	105	
TM (DEG R)	559	578	565	
VM (FT3)	38.28	41.9	40.01	
VM STD (FT3)	34.66237	36.70815	35.84874	
VLQ (ML)	153.8	161.3	160.7	
VV STD (FT3)	7.246694	7.600076	7.571805	
V STD (FT3)	41.90907	44.30822	43.42055	
%M	17.29146	17.15274	17.43829	17.29416
MD	0.827085	0.828472	0.825617	
MWD	29.24	29.24	29.24	
M	27.29643	27.31203	27.27993	
tS (DEG F)	268	305	272	281.6666
TS (DEG R)	728	765	732	741.6666
SUM SQRT DP	15.943	18.294	17.28	
N DP	25	25	25	
AVG SQRT DP	0.63772	0.73176	0.6912	
CP	0.84	0.84	0.84	
VS (FT/SEC)	44.20027	51.97620	48.05292	48.07646
AS (FT2)	16	16	16	
QS, ACFM	42432.26	49897.15	46130.80	46153.40
Q STD (FT3/MIN)	29502.78	33028.64	31903.17	31478.20
Q STD DRY, SCFM	24401.32	27363.32	26339.80	26034.81
WT (GM)*	0.0782	0.0678	0.0703	
PMRC (LB/HR)	7.283188	6.686454	6.833664	6.934435
DN (IN)	0.25	0.25	0.25	
AN (IN2)	0.049062	0.049062	0.049062	
TIME (MIN)	62.5	62.5	62.5	
PMRA (LB/HR)	7.773549	6.739727	6.988242	7.167173
%I	106.7327	100.7967	102.2620	
PMR AVG (LB/HR)	7.528369	6.713090	6.910953	7.050804
%CO2	3.5	3.5	3.5	3.5
%O2	17	17	17	17
%CO	0	0	0	0
%N2	79.5	79.5	79.5	79.5
%EA	426.2788	426.2788	426.2788	426.2788
CS (GR/SCFD)	0.034810	0.028499	0.030258	0.031189

* INCLUDES BOTH DRY AND WET CATCH WEIGHT GAINS 6

SUM SQRT DP CALCULATION

DATE 5/10/88

RUN 1		RUN 2		RUN 3	
DP	SQRT DP	DP	SQRT DP	DP	SQRT DP
0.95	0.974679	0.15	0.387298	0.72	0.848528
0.7	0.836660	0.15	0.387298	0.65	0.806225
0.6	0.774596	0.2	0.447213	0.66	0.812403
0.74	0.860232	0.4	0.632455	0.75	0.866025
0.74	0.860232	0.45	0.670820	1	1
0.95	0.974679	0.67	0.818535	0.72	0.848528
0.65	0.806225	0.56	0.748331	0.65	0.806225
0.45	0.670820	0.3	0.547722	0.5	0.707106
0.58	0.761577	0.3	0.547722	0.56	0.748331
0.6	0.774596	0.2	0.447213	1	1
0.74	0.860232	0.8	0.894427	0.4	0.632455
0.4	0.632455	0.56	0.748331	0.4	0.632455
0.4	0.632455	0.45	0.670820	0.35	0.591607
0.25	0.5	0.5	0.707106	0.46	0.678232
0.35	0.591607	0.5	0.707106	0.65	0.806225
0.15	0.387298	1	1	0.2	0.447213
0.15	0.387298	0.85	0.921954	0.25	0.5
0.19	0.435889	0.67	0.818535	0.25	0.5
0.19	0.435889	0.72	0.848528	0.37	0.608276
0.5	0.707106	0.67	0.818535	0.55	0.741619
0.4	0.632455	1.1	1.048808	0.2	0.447213
0.26	0.509901	0.8	0.894427	0.3	0.547722
0.23	0.479583	0.75	0.866025	0.3	0.547722
0.05	0.223606	0.74	0.860232	0.37	0.608276
0.05	0.223606	0.73	0.854400	0.3	0.547722
SUM	15.93368		18.29385		17.28012

CALCULATION FORMULAE

1. Absolute pressure in dry gas meter

$$P_M = P_{ATM} + DH/13.6$$

2. Absolute Stack Pressure

$$P_S = P_{ATM} + P_{S\ gauge}/13.6$$

3. Sample volume at standard conditions

$$V_M\ STD = (V_M) (T\ STD/T_M) (P_M/P\ STD)$$

4. Volume of water collected, corrected to standard conditions

$$V_V\ STD = (.00267) (V_{LQ}) (T\ STD/P\ STD)$$

5. Total sample volume at standard conditions

$$V\ STD = V_M\ STD + V_V\ STD$$

6. Percent moisture in stack gas

$$\%M = (100) (V_V\ STD)/V\ STD$$

7. Mole Fraction of dry gas

$$M_D = (100 - \%M)/100$$

8. Molecular weight of the wet gas

$$M = (M_{WD}) (M_D) + 18(1 - M_D)$$

9. Stack velocity

$$V_S = (85.48) (C_P) \left((T_S / (P_S) (P_M))^{1/2} \left(\sum DF_i / N\ DF \right) \right)$$

10. Stack volume flow rate

$$Q_S = (60) (V_S) (A_S)$$

11. Stack volume flow rate, standard conditions including moisture

$$Q_{STD} = (T_{STD}/P_{STD}) (P_S/T_S) (Q_S)$$

12. Stack volume flow rate standard conditions dry

$$Q_{STD DRY} = (Q_{STD}) (1 - \%M)$$

13. Pollutant mass rate, concentration basis

$$PMRC = (.1323) (WT) (Q_{STD}) / V_{STD}$$

14. pollutant mass rate ratio of areas basis

$$PMRA = (.1323) (WT) (AS) / (O) (AN) (144)$$

15. Percent Isokineticity

$$\%I = (100) (PMRA) / PMRC$$

16. Average pollutant mass rate

$$PMR_{AVG} = (PMRA + PMRC) / 2$$

17. % excess air

$$\%EA = \frac{(100) (\%oxygen - (.5) (\%carbon\ monoxide))}{(.264) (\%nitrogen) - \%oxygen + (.5) (\%carbon\ monoxide)}$$

18. Heat input rate

$$HI = (.6) (Q_{STD DRY}) / F ((20.9 - \%oxygen) / 20.9)$$

19. Specific emission rate

$$PMRU = PMR_{AVG} / HI$$

NOMENCLATURE

AN	(square inches), Cross sectional area of nozzle
AS	(square feet), Cross sectional area of stack
CP	Pitot tube calibration coefficient
%EA	Percent Excess Air
F	(scfd/10 ⁶ BTU), F factor
DH	(inches of water) Average orifice meter reading
HI	(million BTU/hr), Heat Input Rate
%I	Percent Isokineticity
M	(lb/lb mole), Molecular Weight of wet gas
%M	Percent Moisture
MD	Mole fraction of dry gas
MWD	(lb/lb mole) molecular weight of dry gas
N DP	Number of sample points
P ATM	(in Hg), Local atmospheric pressure
PM	(in Hg), Absolute pressure in dry gas meter
PS	(in Hg), Absolute stack pressure
PS gage	(inches of water), Measured static stack pressure (gage)
P STD	(29.92 in Hg), Standard pressure
PMRA	(lb/hr), Pollutant mass rate based on ratio of areas
PMR AVG.	(lb/hr), Average pollutant mass rate
PMRC	(lb/hr), Pollutant mass rate based on concentration
PMRU	(lb/million BTU), Specific emission rate
DP	(inches of water), Velocity pressure
QS	(cubic feet/min.) Actual stack volume flow rate
Q STD	(cubic feet/min.), Stack volume flow rate at standard conditions

TM (degrees R), Average dry gas meter temperature

TS (degrees R) Average stack temperature

T STD (528 degrees R), Standard temperature

VLO (ml), Liquid volume

VM (cubic feet), Sample volume measured by dry gas meter

VM STD (cubic feet), Sample volume at standard conditions

VS (ft/sec), stack velocity

VV STD (cubic feet), Volume of water vapor collected, corrected to standard conditions

WT (gm), Total weight of particulate collected

• (min), Duration of test

DATA SHEETS

Method 5 Sampling Data Sheets
Impinger Data Sheets
Temperature Data Sheets
Chain of Custody Sheets
Test Survey
Equal Area Determinations
Laboratory Reports
Process Rate Data
Visible Emission Observation Forms
Calibration Information

ANALYTICAL TESTING CONSULTANTS, INC.

SAMPLING DATA SHEET

CUSTOMER/LOCATION Blythe Asphalt TEST # 02 DATE 5/10/88

COLLECTED BY McCombs Poole UNIT SAMPLED Bayhouse

PROCESS OPERATING CONDITIONS (SEE SEPARATE LOG)

Run	Time	Sampling Point	Line V _i in. Hg.	Dry Gas Meter		Stack Temp.	V _p Pitot Rdg.	ΔH P _m Ori-face Rds.	V _m Dry Gas Meter Rds.	Remarks
				t ₁	t ₂					
1	10:20	A1	10	88	/	231	.95	2.3	913.86	
		2	10	91	/	245	.70	1.7	915.77	
	12:5	3	9	90	/	249	.60	1.45	917.97	
		4	9	91	/	251	.74	1.8	919.89	
	30	5	9	94	/	254	.74	1.8	921.81	
	32:5	SHUT DOWN CHANGE PRT							923.42	
	34	B1	10	98	/	263	.95	2.3	923.42	Resume
		2	9.5	99	/	268	.65	1.6	925.56	
	39	3	6	99	/	265	.45	1.1	927.65	
		4	6	101	/	270	.58	1.4	929.35	
	44	5	6	98	/	267	.60	1.45	931.05	
	46:5	SHUT DOWN CHANGE PRT							932.81	PLANT DOWN BURNER DOWN
	49	C1	7	98	/	268	.74	1.8	932.81	
		2	5	100	/	277	.40	1.0	934.86	
	01	3	5	102	/	276	.40	1.0	-	
		4	5	102	/	275	.25	.62	937.92	
	06	5	5	101	/	274	.35	.88	939.20	
	08:5	SHUT DOWN CHANGE PRT							940.61	

P_{bar}: 28.60 in. Hg.
 Static Pressure: _____ in.
 Static Pressure: 4.32 in.

Module S/N: RNW-1
 Filter, Thimble S/N: 495-C
 Nozzle S/N: 1/4"
 Pitot S/N: 701

Sample Train Used

- EPA Method 5 ASTM
 EPA Method 6/8 Other

Pre-Test/Leak Check

< 1005 ft.³ @ 15 "Hg. for 60 sec
 Pitot OK 7.2 5.8
Post-Test Leak Check

< _____ ft.³ @ _____ "Hg. for _____ sec
 Pitot _____

Opacity: Max. 5.0
 AVE. _____

Odor: _____

Orsat # _____

Isokinetic Parameters

Calib Factor 1.59
 $t_m = \frac{80}{100} F$
 $\% H_2O = \frac{8.15}{1.0}$
 $P_s/P_m = 1.0$ } $C = .75$
 Nozzle Dia. 1/4
 $t_s = 240$
 ∴ Theo. Pitot = .75

Notes: * BURNER went out while at PRT change

∴ indicates change in isokinetics

Note: AVE. t₁ and t₂ to determine AVE. t_m

C.T. #RA-16- Rev. P

AVE. t_m = 99 P AVE. t_s = 262 P
 AVE. P_m (ΔH) = 1.13 W.G. ÷ 13.6 = .09 "H
 V_m = 38.22

SAMPLING DATA SHEET

CUSTOMER/LOCATION _____

TEST # _____

DATE 5-10

COLLECTED BY McCombs

UNIT SAMPLED _____

PROCESS OPERATING CONDITIONS (SEE SEPARATE LOG)

Run 1

Time	Samp ling Point	Line V _i in. Hg	t _m		Stack Temp	V _p Pitot Rdg.	ΔH P _m Orim fice Rdg.	V _m Dry Gas Meter Rdg.	Remarks
			t ₁	t ₂					
11:12	D1	2	97	/	258	.15	.38	940.61	
	2	2	99	/	270	.15	.38	944.56	
1:17	3	3	99	/	278	.19	.71	942.57	
	4	4	98	/	278	.19	.71	943.52	
2:22	5	6	95	/	280	.15	1.3	945.65	
2:45	SHUT DOWN CHANGE PORT							946.75	
2:27	F1	5	101	/	284	.40	1.0	946.75	
	2	3	103	/	284	.26	.64	948.25	
3:32	3	3	103	/	282	.23	.57	949.58	
	4	1	103	/	278	.05	.13	950.85	
3:37	5		106	/	275	.05	.13	951.49	
3:55	SHUT DOWN END RUN							952.14	

P_{bar}: _____ in. Hg.
 Static Pressure: _____ in. Hg.
 Static Pressure: _____ in. Hg.

Module S/N: _____
 Filter, Thimble S/N: _____
 Nozzle S/N: _____
 Pitot S/N: _____

Sample Train Used

- EPA Method 5 ASTM
 EPA Method 6/8 Other

Pre-Test Leak Check

< ~~0.0025~~ ft.³ @ ~~13~~ in. Hg. for ~~60~~ sec
 Pitot

Post-Test Leak Check

< 0.0025 ft.³ @ 13 in. Hg. for 60 sec
 Pitot OK 5.760
 Opacity: Max. _____

Avg. _____

Odor: _____

Orsat # _____ @ _____

Isokinetic Parameters

Calib. Factor _____
 $t_m = \frac{V_m}{F}$
 $X_{H_2O} = \frac{P_s}{P_m}$
 $P_s/P_m = \frac{V_m}{V_m}$
 Nozzle Dia. _____
 $t_s = \frac{V_m}{V_m}$
 Theo. Pitot = _____

Notes:

* indicates change in isokinetics

Notes: Avg. t₁ and t₂ to determine Avg. t_m

Avg. t_m = _____ P Avg. t_s = _____ P
 Avg. P_m (ΔH) = _____ W.G. ÷ 13.6 = _____ "H.
 V_m = _____

ANALYTICAL TESTING CONSULTANTS, INC.

SAMPLING DATA SHEET

CUSTOMER/LOCATION Bl. the TEST # _____ DATE 5-10-68

COLLECTED BY Mc Combs Pool UNIT SAMPLED Backhouse

PROCESS OPERATING CONDITIONS (SEE SEPARATE LOG)

Run	Time	Samp ling Point	Line V _i in. Hg	t _m		t _s	V _p	ΔH P _m	V _m	Remarks
				Dry Gas Meter t ₁ t ₂	Stack Temp					
Two	1:05	E1	1	106	/	197	.15	.36	953.06	
		2	1	107	/	249	.15	.36	954.07	
	1:10	3	2	106	/	286	.20	.48	955.02	
		4	2	108	/	295	.40	.95	956.07	
	1:15	5	2	108	/	301	.45	1.05	957.59	
	1:17.5	SHUT DOWN CHANGE PORT							959.16	
	1:20	D1	3	112	/	301	.67	1.5	957.16	*
		2	3	113	/	314	.56	1.3	960.70	
	1:25	3	2	115	/	314	.30	.69	962.51	
		4	2	114	/	317	.30	.65	963.94	
	1:30	5	1	115	/	302	.20	.48	965.18	
	1:32.5	SHUT DOWN CHANGE PORT							966.17	
	1:34	C1	6	118	/	319	.80	1.8	966.17	
		2	5	123	/	324	.56	1.3	968.32	
	1:39	3	4	121	/	323	.45	1.0	-	
		4	4	120	/	322	.50	1.1	971.23	
	1:44	5	4	119	/	317	.50	1.1	972.69	
	1:45	SHUT DOWN CHANGE PORT							974.32	

P_{bar}: 28.60 in. Hg.
 Static Pressure: _____ in. Hg.
 Static Pressure: 4.52 in. Hg.

Module S/N: RNW #1
 Filter, Thimble S/N: 1571
 Nozzle S/N: #4 #2
 Pitot S/N: 702

Sample Train Used

- EPA Method 5
- EPA Method 6/8
- ASTM
- Other

Pre-Test Leak Check

< 0.02 ft.³ @ 15 in. Hg. for 60 sec
 Pitot OK 6.2 7.0

Post-Test Leak Check

< _____ ft.³ @ _____ in. Hg. for _____ sec
 Pitot _____
 Opacity: Max. _____
 Avg. _____

Odor: _____
 Orsat # _____ @ _____

Isokinetic Parameters

Calib. Factor _____
 $t_m = \frac{V_m}{V_p} F$
 $\% H_2O = \dots$
 $P_s / P_m = \dots$
 Nozzle Dia. 1/4
 $t_s = \frac{260}{300}$
 $\therefore \text{Theo. Pitot} = .80 \times .84$

Notes:

* indicates change in isokinetics

Note: AVG. t₁ and t₂ to determine AVG. t_m

AVG. t_m = 118 P AVG. t_s = 305 P
 AVG. P_m (ΔH) = 1.29 W.G. ÷ 13.6 = .10 in. Hg.
 V_m = 41.90

ANALYTICAL TESTING CONSULTANTS, INC.

SAMPLING DATA SHEET

CUSTOMER/LOCATION Blythe

TEST # _____ DATE 5-10-88

COLLECTED BY McCombs Poole

UNIT SAMPLED Baghouse

PROCESS OPERATING CONDITIONS (SEE SEPARATE LOG)

Run 1100

Time	Sampling Point	Line V _i in. Hg	t _m		t _s Stack Temp	V _p Pitot Rdg.	ΔH P _m Orifice Rdg.	V _m Dry Gas Meter Rdg.	Remarks
			t ₁	t ₂					
:48	B1	7	119	/	318	1.0	2.2	974.32	
	2	6	119	/	322	.85	1.85	976.43	
:53	3	5	120	/	323	.67	1.5	978.62	
	4	5	118	/	321	.72	1.7	980.50	
:58	5	5	119	/	317	.67	1.5	981.7	
:05	SHUT DOWN		CHANGE PORT					984.20	
02	A1	8	125	/	307	1.1	2.4	984.30	
	2	7	127	/	311	.80	1.8	986.76	
:07	3	5	130	/	311	.75	1.7	988.89	
	4	5	124	/	308	.74	1.7	990.98	
:12	5	5	128	/	304	.73	1.7	-	
:15	SHUT DOWN		END RUN					994.90	

P_{bar}: _____ in. Hg.
 Static Pressure: _____ in. Hg.
 Static Pressure: _____ in. Hg.

Module S/N: _____
 Filter, Thimble S/N: _____
 Nozzle S/N: _____
 Pitot S/N: _____

Sample Train Used

- EPA Method 5
- EPA Method 6/8
- ASTM
- Other

Pre-Test Leak Check

< 0.3 ft.³ @ 9 in. Hg. for 60 sec
 Pitot

Post-Test Leak Check

< 0.07 ft.³ @ 9 in. Hg. for 60 sec
 Pitot OK 7.6 5.2
 Opacity: Max. _____
 Avg. _____

Odor: _____
 Orsat # _____

Isokinetic Parameters

Calib Factor _____
 $t_m = \frac{V_m}{V_p} F$
 $\% H_2O = \frac{W.G.}{13.6} \times 100$
 $P_s / P_m = \frac{W.G.}{13.6} \times 100$
 Nozzle Dia. _____
 $t_s = \frac{V_m}{V_p} F$
 $\therefore \text{Theo. Pitot} = \frac{V_m}{V_p} F$

Notes:

Indicates change in isokinetics

Notes: AVG. t₁ and t₂ to determine Avg. t_m

AVG. t_m = _____ P
 AVG. P_m (ΔH) = _____ W.G. ÷ 13.6 = _____ "H₂O
 V_m = _____

ANALYTICAL TESTING CONSULTANTS, INC.

SAMPLING DATA SHEET

CUSTOMER/LOCATION Blythe TEST # _____ DATE 5-10-88

COLLECTED BY McCombs Poole UNIT SAMPLED Bayhousk

PROCESS OPERATING CONDITIONS (SEE SEPARATE LOG)

Run	Time	Sampling Point	Line V _i in. Hg	Dry Gas Meter		Stack Temp	V _p Pitot Rdg.	ΔH P _m Orifice Rdg.	V _m Dry Gas Meter Rds	Remarks
				t ₁	t ₂					
3	3:10	A1	5	100	/	240	.72	1.6	995.83	
		2	5	98	/	248	.65	1.5	997.68	
	15	3	5	98	/	250	.66	1.5	999.35	
		4	6	98	/	255	.75	1.8	1001.23	*
	20	5	8	98	/	260	1.0	2.3	103.17	
	22.5	SHUT DOWN CHANCEPORT								
	24	B1	5.5	97	/	256	.72	1.7	105.46	
		2	5	97	/	262	.65	1.5	-	
	29	3	4	98	/	267	.50	1.2	109.25	
		4	4	97	/	269	.56	1.3	109.9	
	34	5	8	100	/	272	1.0	2.3	112.59	
	36.5	SHUT DOWN CHANCEPORT								
	38	C1	3	102	/	272	.46	.96	114.88	
		2	3	104	/	274	.40	.96	116.90	
	43	3	3	106	/	278	.35	.85	-	
		4	3	108	/	280	.46	1.1	118.01	
	48	5	5	109	/	281	.65	1.5	120.50	
	53	SHUT DOWN CHANCEPORT								
		5							122.54	

P_{bar}: 28.60 in. Hg.
 Static Pressure: _____ in.
 Static Pressure: 32 in.

Module S/N: RNW #1
 Filter, Thimble S/N: 1570
 Nozzle S/N: 1/4 #1
 Pitot S/N: 701

Sample Train Used

- EPA Method 5
- EPA Method 6/8
- ASTM
- Other

Pre-Test Leak Check

< 0.05 ft.³ @ 12 "Hg. for 60 sec
 Pitot OK 5.760

Post-Test Leak Check

< _____ ft.³ @ _____ "Hg. for _____ sec
 Pitot _____
 Opacity: Max. _____
 Avg. _____

Odor: _____
 Orsat # _____ 6 _____

Isokinetic Parameters

Calib. Factor _____
 $t_m = \frac{V_m}{Q} F$
 $\% H_2O = \frac{P_s}{P_m}$
 Nozzle Dia. 1/4
 $t_s = 7260$
 $\therefore \text{Theo. Pitot} = .80$

Notes:

indicates change in isokinetics

Notes: AVG. t₁ and t₂ to

determine AVG. t_m

AVG. t_m = 105 P AVG. t_s = 292 P

AVG. P_m (ΔH) = 1.18 W.G. ÷ 13.6 = .09 "Hg

V_m = 40.01

ANALYTICAL TESTING CONSULTANTS, INC.

TEMPERATURE DATA

JOE Blythe Asphalt LOCATION Henrieville, NC UNIT Baghouse Exhaust
 DATE 5/10/88 MADE BY Paul CHECKED BY _____

Run # <u>1</u>				Run # <u>2</u>				Run # <u>3</u>			
Time or Pt.	Probe Temp. F.	"Hot Box" Temp. F.	Exit Gas Temp. F.	Time or Pt.	Probe Temp. F.	"Hot Box" Temp. F.	Exit Gas Temp. F.	Time or Pt.	Probe Temp. F.	"Hot Box" Temp. F.	Exit Gas Temp. F.
A1	Hot	265°	64°	A1	Hot	230°	67°	A1	Hot	275°	62°
2		265°	64°	2		230°	68°	2		275°	62°
3		265°	64°	3		230°	67°	3		275°	63°
4		265°	64°	4		230°	67°	4		275°	63°
5		265°	64°	5		230°	67°	5		270°	64°
B1		265°	64°	B1		240°	68°	B1		270°	64°
2		265°	66°	2		245°	68°	2		270°	64°
3		268°	66°	3		248°	68°	3		270°	64°
4		270°	68°	4		255°	68°	4		265°	65°
5		270°	68°	5		260°	69°	5		265°	65°
C1		270°	68°	C1		265°	68°	C1		260°	66°
2		270°	68°	2		270°	68°	2		260°	66°
3		272°	68°	3		270°	68°	3		265°	67°
4		272°	68°	4		270°	67°	4		265°	67°
5		272°	68°	5		270°	67°	5		265°	67°
D1		270°	68°	D1		275°	67°	D1		265°	67°
2		270°	66°	2		275°	67°	2		270°	67°
3		268°	66°	3		275°	68°	3		270°	67°
4		268°	66°	4		275°	68°	4		270°	67°
5		265°	64°	5		275°	69°	5		275°	67°
E1		262°	64°	E1		270°	68°	E1		275°	67°
2		262°	64°	2		270°	68°	2		275°	68°
3		260°	64°	3		265°	68°	3		275°	68°
4		260°	64°	4		260°	68°	4		275°	68°
5		260°	64°	5		255°	68°	5		275°	68°

(21)

ANALYTICAL TESTING CONSULTANTS, INC.

CHAIN OF CUSTODY FORM

Plant Blythe Ind. Hendersonville, NC

Test Method

Run No. 1, 2, 3

EPA 5 EPA

Sampling Location Baghouse Exhaust

EPA 6 _____

Filter No. 495-C, 1571, 1570

EPA 7 _____

Container No.	Contents	Sample Recovered by	Remarks
<u>Filter Bags R1, R2, R3</u>	Filter	<u>Poolc</u>	
<u>Dry R1, R2, R3 - Dry Catch Wash</u>	Probe, nozzle and cyclone washings	<u>McCombs</u>	
<u>Imp 1, 2, 3 - Wet Catch Solution</u>	Impinger solutions	<u>Poolc</u>	
<u>- Wet Catch Wash</u>	Impinger washings		<u>Combined w/ Solutions</u>
<u>Imp 7, 8, 9, 1, 2, 3</u>	Silica gel	<u>Poolc</u>	
<u>Solvent</u>	Solvent blank	<u>McCombs</u>	

Note: Liquid levels to be marked with grease pencil on all sample containers and to be checked when delivered to lab.

Delivered to lab by: Poolc

Date 5/11/88

Received in lab by: Fink

Date 5/11/88

Analysis completed by Fink

Date 5/11/88

SOURCE TEST SURVEY

SOURCE NAME: Blythe Ind
 LOCATION: Lisect Pt.
 DATE: 11/17/71 OBSERVER'S NAME: WDT

PURPOSE OF TEST: Compliance
 TESTING DONE BY: A.T.C. Inc
 LAB ANALYSIS DONE BY: A.T.C. Inc

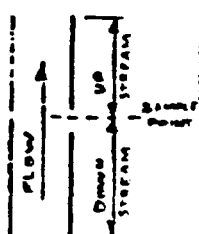
COMPANY CONTACT: Herice Turberville Telephone: _____
 CONTROL EQUIPMENT OPERATING: ✓
 OPACITY READING MADE: YES ✓ NO

UNIT/PROCESS NAME: Baghouse - Kila exhaust
 RATED CAPACITY: 200 Tons/hr
 TYPE FUEL USED: _____

APPROX. PROCESS RATE: 190 tons/hr
 METHOD OF DETERMINING PROCESS RATE: _____

STACK HEIGHT: _____
 INDIVIDUAL STACK X COMMON STACK _____
 DIAMETER: (IF ROUND) _____ (IF RECTANGULAR) WIDTH 4' LENGTH _____

I. SAMPLING POINT LOCATION



- A. DISTANCE DOWNSTREAM FROM ANY FLOW DISTURBANCE: 8' 16'
 NATURE OF DISTURBANCE: expansion duct
 (BEND, CONTRACTION, EXPANSION, FAN, BAFFLES, ETC.) 5/8"
 B. DISTANCE UPSTREAM FROM ANY FLOW DISTURBANCE: 2'
 NATURE OF DISTURBANCE: WDT
 (BEND, STACK EXIT, CONTRACTION, FAN, BAFFLES, EXPANSION)
 C. NUMBER OF PORTS IN STACK: 5
 D. NUMBER OF POINTS SAMPLED PER PORT: 45

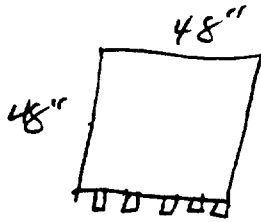
II. STACK GAS

- A. STACK TEMPERATURE: 240
 B. ORSAT ANALYSIS: Fyrite
 GRAE Y CONTINUOUS _____ NUMBER OF INTEGRATED SAMPLES _____
 C. PRELIMINARY ΔP: MIN. 1.0 in H₂O MAX. 2.4

III. PARTICULATE TEST

- A. SAMPLING TRAIN:
 1. TEST METHOD: EPA METHOD 5 ✓ ASME FTC 21/27 _____
 OTHER (DISCRIBE) _____
 2. TYPE FILTERS A/E Class Filter
 3. PROBE IDENTIFICATION sig. 1182
 4. METER CALIBRATION FACTOR 1.0
 5. ORIFICE Δ H @ FACTOR 1.2
 6. DATE OF LAST CALIBRATION CHECK _____
 a. ORIFICE METER See 6. DRY GAS METER
 b. TEMPERATURE DEVICES See 6. TUBE
 c. NOZZLE DIAMETER _____ f. OTHER _____

Blythe Ind Hendersonville NC
Equal Area



5 points

use 5x5 points @ 2.5 min/pt

	To Depth	Depth
1	10%	4.8"
2	30%	14.4"
3	50%	24"
4	70%	33.6"
5	90%	43.2"

Blythe Ind. Hendersonville NC 5/10/88
 Bal. Check Auto cal

Dry catch wash

Vol	Run #	Beaker	Final	Initial	Net
334	1	B1	77.7097	77.6835	.0262
306	2	B2	79.3880	79.3590	.0290
265	3	B3	66.0288	66.0042	.0246
100	Blank	BL	79.6640	79.6639	.0001

Wet catch

240	1	W1	63.5687	63.5214	.0473
225	2	W2	74.2788	74.2427	.0361
205	3	W3	71.8412	71.8007	.0405
100	Blank	WB	78.1935	78.1932	.0002

Filters

Run #	Filter #	Final 1	Final 2	Init	Net
1	495-C	.2170	.2170	.2123	.0047
2	1571	.8363	.8362	.8336	.0027
3	1570	.8501	.8500	.8449	.0052

W04
 5/20/88

Totals	Filter	Air Wash	Water Catch	Total
1	.0047	.0262	.0473	.0782
2	.0027	.0290	.0361	.0678
3	.0052	.0246	.0405	.0703

Process Data

TPH rate	9	-	9.5	0.0	0.0	0.0	0.0
TON total	+0	+0	0.00	0	0	0	0

lythe Industries inc 052787 Process Off 09:00 05/10/88

FIB Mix 0	0TPH	55F	0TONS	0.0%MAC	358F	[0.0%+ 6.5%r]	09 05	05/10/88
	VIR	RAP	+AC	1 Bin	2 Bin	3 Bin	4 Rap	
MOISTURE	0.0	0.0		2.0	4.0	4.0	2.0	
TPH rate	19	+	9.5	0.0	0.0	0.0	0.0	
TON total	+1	2.5	0.00	0	0	0	0	

lythe Industries inc 052787 Process Off 09:59 05/10/88

FIB Mix 0	0TPH	61F	0TONS	0.0%MAC	357F	[0.0%+ 6.5%r]	10:00	05/10/88
	VIR	RAP	+AC	1 Bin	2 Bin	3 Bin	4 Rap	
MOISTURE	2.7	0.0		2.0	4.0	4.0	2.0	
TPH rate	65	-1	9.5	101.4	40.2	10.0	28.3	
TON total	+1	2.5	0.00	1	+	+	1	

FIB Mix 11 0TPH 63F 0TONS 0.0%MAC 354F [0.0%+ 6.5%r] 10:00 05/10/88

	VIR	RAP	+AC	1 Bin	2 Bin	3 Bin	4 Rap
MOISTURE	2.7	2.0		2.0	4.0	4.0	2.0
TPH rate	117	39	9.5	100.4	40.0	10.0	49.2
TON total	1.1	2.6	0.00	2	1	+	2

FIB Mix 11 212TPH 109F 170TONS 5.6%MAC 353F [4.1%+ 6.5%r] 10 48 05/10/88

	VIR	RAP	+AC	1 Bin	2 Bin	3 Bin	4 Rap
MOISTURE	2.7	2.0		2.0	4.0	4.0	2.0
TPH rate	24	-	0.0	0.0	0.0	0.0	0.0
TON total	128.0	40.7	7.03	82	33	8	41

lythe Industries inc 052787 Process Off 10:49 05/10/88

FIB Mix 11	80TPH	118F	174TONS	5.6%MAC	350F	[4.1%+ 6.5%r]	10:51	05/10/88
	VIR	RAP	+AC	1 Bin	2 Bin	3 Bin	4 Rap	
MOISTURE	2.7	2.0		2.0	4.0	4.0	2.0	
TPH rate	153	48	7.7	100.7	40.0	10.0	49.2	
TON total	130.7	41.5	7.19					

212 Taylor Ave

VISIBLE EMISSION OBSERVATION FORM

No. 0001

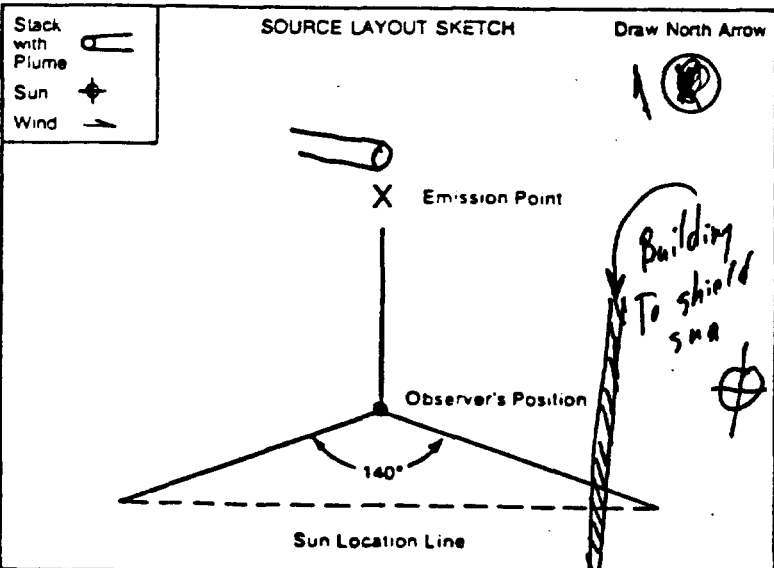
COMPANY NAME *Blythe Asphalt*
 STREET ADDRESS
 CITY *Hendersonville* STATE *N.C.* ZIP
 PHONE (KEY CONTACT) SOURCE ID NUMBER

PROCESS EQUIPMENT *Cont. mix asphalt plant* OPERATING MODE *normal*
 CONTROL EQUIPMENT *Bag house* OPERATING MODE *normal*

DESCRIBE EMISSION POINT
outlet stack from baghouse I.D.
Fan
 HEIGHT ABOVE GROUND LEVEL *30'* HEIGHT RELATIVE TO OBSERVER
 Start *40'* End
 DISTANCE FROM OBSERVER *300yds* DIRECTION FROM OBSERVER
 Start *N.* End

DESCRIBE EMISSIONS
 Start *Condensibly* End *Same*
 EMISSION COLOR Start *Blue* End IF WATER DROPLET PLUME
 Attached Detached
 POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
 Start *after condensation* End

DESCRIBE PLUME BACKGROUND
 Start *Trees* End
 BACKGROUND COLOR Start *Green* End SKY CONDITIONS
 Start *Pt. cldy* End *same*
 WIND SPEED Start *1mph* End WIND DIRECTION
 Start *N.E.* End
 AMBIENT TEMP Start *65* End WET BULB TEMP RH. percent



ADDITIONAL INFORMATION

OBSERVATION DATE		START TIME		END TIME	COMMENTS
5/10/88		10:16		10:46	
SEC	0	15	30	45	MIN
1	40	35	35	30	
2	35	35	30	35	
3	30	30	40	35	
4	30	30	35	40	
5	30	35	35	40	
6	30	30	40	35	
7	40	40	35	40	
8	40	40	45	45	
9	40	45	40	45	
10	40	45	40	40	
11	35	40	40	45	
12	35	40	40	40	
13	35	35	35	30	
14	30	35	40	35	
15	35	40	40	40	
16	50	45	40	35	
17	35	35	40	30	
18	40	35	35	40	
19	40	35	40	40	
20	40	35	35	35	
21	35	30	35	35	
22	35	35	30	40	
23	40	40	45	45	
24	35	40	40	35	
25	35	35	35	40	
26	30	35	35	35	
27	30	35	35	40	
28	35	35	35	40	
29	40	30	30	30	
30	30	30	25	10	Blower off -

OBSERVER'S NAME (PRINT) *Richard N Westbrook*
 OBSERVER'S SIGNATURE *[Signature]* DATE *5/10/88*
 ORGANIZATION *ANALYTICAL TESTING CONSULTANTS, INC*
 CERTIFIED BY *State of Ga.* DATE *March 88*
 CONTINUED ON VED FORM NUMBER *0002* ~~0001~~

VISIBLE EMISSION OBSERVATION FORM

No. 0003

COMPANY NAME *Bl. the Asphalt*

STREET ADDRESS

CITY *Hendersonville* STATE *N.C.* ZIP

PHONE (KEY CONTACT) SOURCE ID NUMBER

PROCESS EQUIPMENT OPERATING MODE

CONTROL EQUIPMENT OPERATING MODE

DESCRIBE EMISSION POINT

HEIGHT ABOVE GROUND LEVEL HEIGHT RELATIVE TO OBSERVER
Start End Start End

DISTANCE FROM OBSERVER DIRECTION FROM OBSERVER
Start End Start End

DESCRIBE EMISSIONS

Start End

EMISSION COLOR IF WATER DROPLET PLUME
Start End Attached Detached

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
Start End

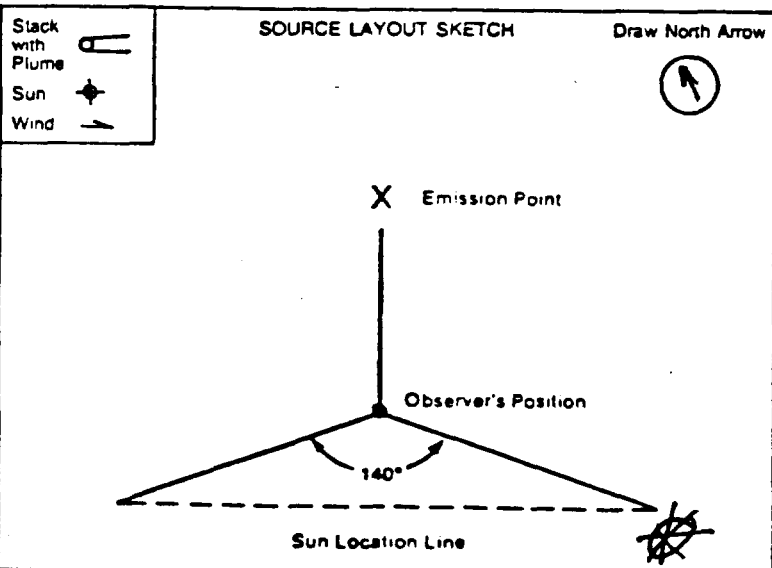
DESCRIBE PLUME BACKGROUND *See Run #1*

Start End

BACKGROUND COLOR SKY CONDITIONS
Start End Start *Clear* End

WIND SPEED *5 mph* WIND DIRECTION
Start End Start End

AMBIENT TEMP *70* WET BULB TEMP RH, percent
Start End



ADDITIONAL INFORMATION

SEC	OBSERVATION DATE				START TIME	END TIME
	0	15	30	45	COMMENTS	
1	20	15	20	20	Start Run #2	
2	15	20	20	20		
3	20	15	20	25		
4	25	20	25	30		
5	30	25	25	25		
6	30	25	25	20		
7	25	20	20	20		
8	15	20	15	20		
9	25	20	30	30		
10	25	20	20	15		
11	20	20	25	20		
12	20	30	25	25		
13	20	25	25	25		
14	20	25	25	25		
15	25	25	30	25		
16	25	30	25	25		
17	30	25	25	25		
18	25	25	30	25		
19	25	20	25	30		
20	25	25	25	30		
21	25	25	25	30		
22	25	25	20	25		
23	25	25	30	25		
24	25	25	25	20		
25	20	20	25	25		
26	30	25	25	25		
27	25	25	30	30		
28	30	30	30	25		
29	30	35	30	30		
30	35	30	35	30		

OBSERVER'S NAME (PRINT) *Richard N. Westbrook*

OBSERVER'S SIGNATURE *Richard N. Westbrook* DATE *8/19/88*

ORGANIZATION **ANALYTICAL TESTING CONSULTANTS, INC**

CERTIFIED BY *State of Ga.* DATE *March 88*

VISIBLE EMISSION OBSERVATION FORM

No. 0002

COMPANY NAME
Blythe Asphalt

STREET ADDRESS

CITY
Hendersonville

STATE
N.C.

ZIP

PHONE (KEY CONTACT)

SOURCE ID NUMBER

PROCESS EQUIPMENT
Cont. mix asphalt plant

OPERATING MODE
Normal

CONTROL EQUIPMENT
Bag house

OPERATING MODE
Normal

DESCRIBE EMISSION POINT
Exhaust stack from bag house I.P.

Fans

HEIGHT ABOVE GROUND LEVEL
30

HEIGHT RELATIVE TO OBSERVER
Start End

DISTANCE FROM OBSERVER
Start *300 yds* End

DIRECTION FROM OBSERVER
Start End

DESCRIBE EMISSIONS

Start End

EMISSION COLOR

IF WATER DROPLET PLUME
Attached Detached

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
Start End

DESCRIBE PLUME BACKGROUND

Start End

BACKGROUND COLOR

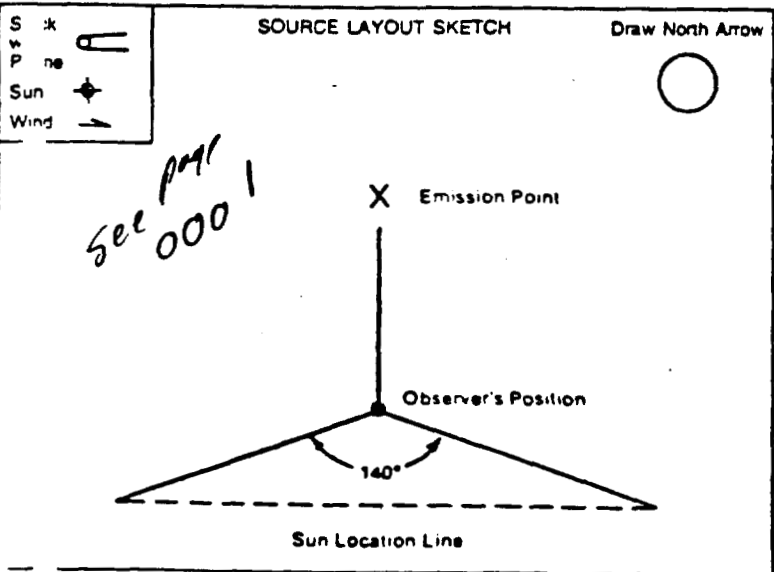
SKY CONDITIONS
Start End

WIND SPEED

WIND DIRECTION
Start End

AIR TEMP

WET BULB TEMP RH, percent



OBSERVATION DATE		START TIME		END TIME	COMMENTS
<i>5/10/00</i>		<i>11:00</i>		<i>11:30</i>	
SEC	0	15	30	45	
1	35	30	35	35	
2	40	35	40	35	
3	30	30	30	30	
4	35	35	30	35	
5	35	40	35	35	
6	30	40	35	35	
7	35	40	35	30	
8	30	30	35	35	
9	30	35	35	30	
10	35	35	30	35	
11	30	35	35	35	
12	20	30	35	40	
13	40	35	35	30	
14	30	30	35	30	
15	25	30	35	35	
16	30	35	35	35	
17	30	35	30	35	
18	35	30	30	35	
19	30	35	35	30	
20	30	35	35	35	
21	35	30	35	35	
22	40	40	35	35	
23	30	35	35	35	
24	40	35	35	35	
25	35	35	30	35	
26	35	35	40	40	
27	35	35	35	35	
28	30	35	35	35	
29	35	30	30	30	
30	35	30	35	30	<i>End Run #1</i>

OBSERVER'S NAME (PRINT)
Richard N. Westbrook

OBSERVER'S SIGNATURE
Richard Westbrook

DATE
5/10/00

ORGANIZATION
ANALYTICAL TESTING CONSULTANTS, INC. INC

CERTIFIED BY
State of Ga.

DATE
March 08 00

ADDITIONAL INFORMATION

CONTINUED ON VED FORM NUMBER

VISIBLE EMISSION OBSERVATION FORM

No. 0009

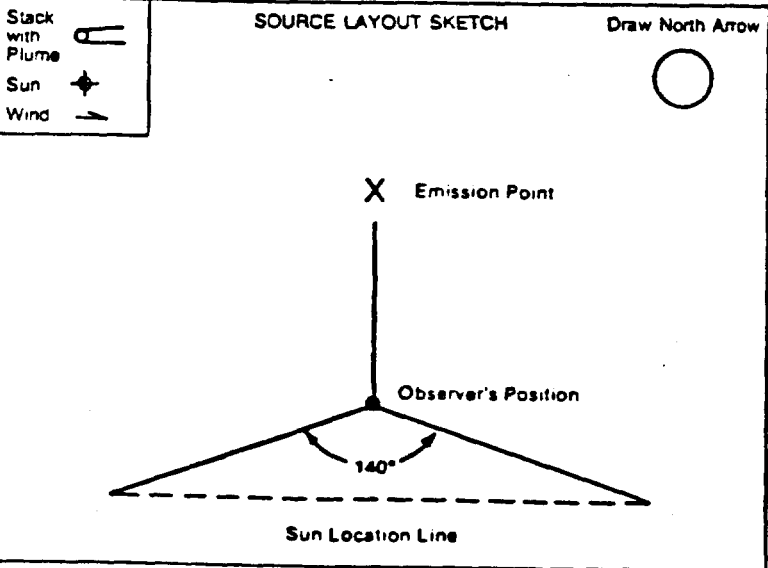
COMPANY NAME *Bly the Asphalt*
 STREET ADDRESS
 CITY STATE ZIP
 PHONE (KEY CONTACT) SOURCE ID NUMBER

PROCESS EQUIPMENT OPERATING MODE
 CONTROL EQUIPMENT OPERATING MODE

DESCRIBE EMISSION POINT
 HEIGHT ABOVE GROUND LEVEL HEIGHT RELATIVE TO OBSERVER
 DISTANCE FROM OBSERVER DIRECTION FROM OBSERVER

DESCRIBE EMISSIONS
 EMISSION COLOR IF WATER DROPLET PLUME
 POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED

DESCRIBE PLUME BACKGROUND
 BACKGROUND COLOR SKY CONDITIONS
 WIND SPEED WIND DIRECTION
 AMBIENT TEMP WET BULB TEMP RH, percent



ADDITIONAL INFORMATION

MIN	OBSERVATION DATE				START TIME	END TIME
	0	15	30	45	COMMENTS	
1	30	30	25	38		
2	25	25	30	25		
3	25	30	25	30		
4	30	25	30	35		
5	30	25	25	30		
6	30	25	30	30		
7	30	25	25	30		
8	25	30	30	30		
9	30	35	30	25		
10	30	25	25	30		
11	30	30	30	30		
12	30	25	30	25		
13	30	30	25	25		
14	30	30	30	30		
15	30	25	30	30		
16	35	30	30	35		
17	30	30	25	30		
18	25	30	25	25		
19	25	30	25	30		
20	25	30	25	25		
21	30	30	25	30		
22	35	30	30	25		
23	30	30	30	25		
24	30	35	30	25		
25	25	30	30	25		
26	30	30	25	25		
27	20	25	25	30		
28	30	25	25	20		
29	25	25	30	25		
30	30	30	30	30	<i>End Run</i>	

OBSERVER'S NAME (PRINT) *Richard N Westbrook*
 OBSERVER'S SIGNATURE *Richard N Westbrook* DATE *5/10/88*
 ORGANIZATION **ANALYTICAL TESTING CONSULTANTS, INC**
 CERTIFIED BY *State of Ga.* DATE *March 88*

VISIBLE EMISSION OBSERVATION FORM

No. 0005

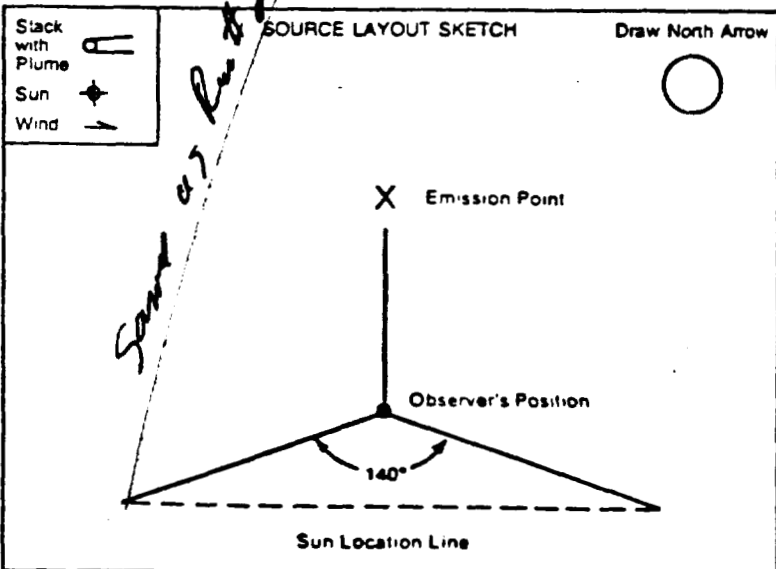
COMPANY NAME *Bly the Asphalt*
 STREET ADDRESS
 CITY *Hendersonville* STATE *N.C.* ZIP
 PHONE (KEY CONTACT) SOURCE ID NUMBER

PROCESS EQUIPMENT OPERATING MODE
 CONTROL EQUIPMENT OPERATING MODE

DESCRIBE EMISSION POINT
 HEIGHT ABOVE GROUND LEVEL HEIGHT RELATIVE TO OBSERVER
 Start End Start End
 DISTANCE FROM OBSERVER DIRECTION FROM OBSERVER
 Start End Start End

DESCRIBE EMISSIONS
 Start End
 EMISSION COLOR IF WATER DROPLET PLUME
 Start End Attached Detached
 POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
 Start End

DESCRIBE PLUME BACKGROUND
 Start End
 BACKGROUND COLOR SKY CONDITIONS
 Start End Start End
 WIND SPEED WIND DIRECTION
 Start End Start End
 AMBIENT TEMP WET BULB TEMP RH, percent
 Start End



ADDITIONAL INFORMATION

OBSERVATION DATE		START TIME		END TIME	COMMENTS
5/10/88		3:05		Next Pg	
SEC	0	15	30	45	COMMENTS
MIN					
1	20	25	25	20	Start Line 3
2	25	25	20	25	
3	25	25	20	25	
4	25	25	30	25	
5	20	20	25	20	
6	25	20	25	25	
7	20	15	20	20	
8	20	15	20	20	
9	25	20	25	25	
10	25	25	20	25	
11	30	25	25	30	
12	30	25	25	25	
13	30	25	30	30	
14	25	30	25	30	
15	25	25	30	25	
16	25	30	25	30	
17	25	25	30	30	
18	30	30	25	30	
19	25	30	30	25	
20	25	30	30	30	
21	30	30	30	30	
22	25	30	30	25	
23	25	25	30	25	
24	30	30	30	25	
25	30	25	30	30	
26	25	30	25	25	
27	30	30	30	25	
28	25	25	30	35	
29	25	20	25	30	
30	30	30	30	30	

OBSERVER'S NAME (PRINT) *Richard N Westbrook*
 OBSERVER'S SIGNATURE *Richard N Westbrook* DATE *5/10/88*
 ORGANIZATION
 ANALYTICAL TESTING CONSULTANTS, INC
 CERTIFIED BY *State of Ga.* DATE *March 88*

VISIBLE EMISSION OBSERVATION FORM

No. 0006

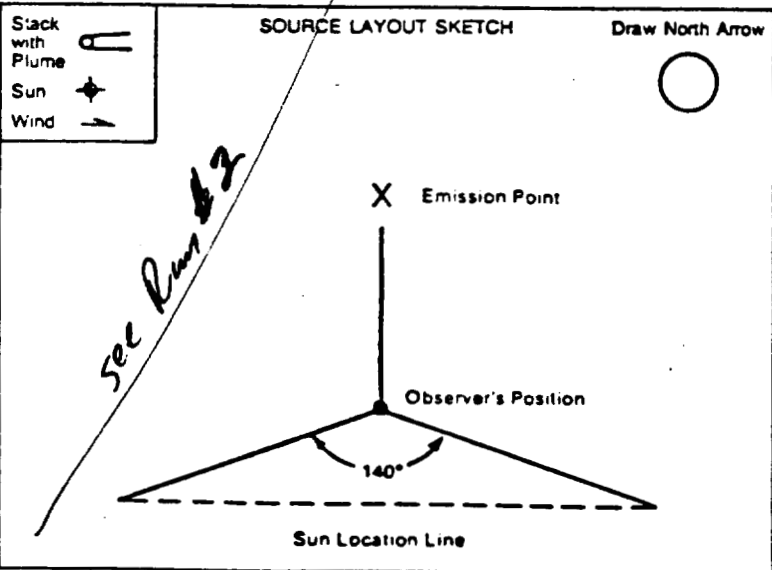
COMPANY NAME *Blythe Asphalt.*
 STREET ADDRESS
 CITY *Hendersonville* STATE *N.C.* ZIP
 PHONE (KEY CONTACT) SOURCE ID NUMBER

PROCESS EQUIPMENT OPERATING MODE
 CONTROL EQUIPMENT OPERATING MODE

DESCRIBE EMISSION POINT
 HEIGHT ABOVE GROUND LEVEL HEIGHT RELATIVE TO OBSERVER
 Start End
 DISTANCE FROM OBSERVER DIRECTION FROM OBSERVER
 Start End Start End

DESCRIBE EMISSIONS
 Start End
 EMISSION COLOR IF WATER DROPLET PLUME
 Start End Attached Detached
 POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
 Start End

DESCRIBE PLUME BACKGROUND
 Start End
 BACKGROUND COLOR SKY CONDITIONS
 Start End Start End
 WIND SPEED WIND DIRECTION
 Start End Start End
 AMBIENT TEMP WET BULB TEMP RH, percent
 Start End



OBSERVATION DATE	START TIME				END TIME	COMMENTS
	0	15	30	45		
<i>5/10/88</i>				<i>See previous</i>	<i>4:05</i>	
MIN						
1	<i>25</i>	<i>30</i>	<i>30</i>	<i>25</i>		
2	<i>25</i>	<i>30</i>	<i>30</i>	<i>30</i>		
3	<i>25</i>	<i>25</i>	<i>30</i>	<i>30</i>		
4	<i>30</i>	<i>30</i>	<i>30</i>	<i>30</i>		
5	<i>25</i>	<i>30</i>	<i>30</i>	<i>30</i>		
6	<i>30</i>	<i>35</i>	<i>30</i>	<i>30</i>		
7	<i>35</i>	<i>30</i>	<i>25</i>	<i>30</i>		
8	<i>25</i>	<i>30</i>	<i>25</i>	<i>25</i>		
9	<i>30</i>	<i>25</i>	<i>30</i>	<i>30</i>		
10	<i>30</i>	<i>25</i>	<i>25</i>	<i>30</i>		
11	<i>30</i>	<i>30</i>	<i>25</i>	<i>30</i>		
12	<i>30</i>	<i>35</i>	<i>30</i>	<i>30</i>		
13	<i>35</i>	<i>30</i>	<i>30</i>	<i>25</i>		
14	<i>30</i>	<i>30</i>	<i>25</i>	<i>30</i>		
15	<i>30</i>	<i>30</i>	<i>30</i>	<i>30</i>		
16	<i>30</i>	<i>30</i>	<i>25</i>	<i>30</i>		
17	<i>35</i>	<i>30</i>	<i>30</i>	<i>30</i>		
18	<i>25</i>	<i>30</i>	<i>25</i>	<i>25</i>		
19	<i>30</i>	<i>25</i>	<i>30</i>	<i>25</i>		
20	<i>25</i>	<i>30</i>	<i>25</i>	<i>25</i>		
21	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>		
22	<i>25</i>	<i>30</i>	<i>25</i>	<i>25</i>		
23	<i>25</i>	<i>25</i>	<i>25</i>	<i>30</i>		
24	<i>25</i>	<i>25</i>	<i>20</i>	<i>25</i>		
25	<i>25</i>	<i>30</i>	<i>25</i>	<i>25</i>		
26	<i>30</i>	<i>25</i>	<i>25</i>	<i>25</i>		
27	<i>20</i>	<i>20</i>	<i>25</i>	<i>25</i>		
28	<i>20</i>	<i>25</i>	<i>25</i>	<i>30</i>		
29	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>		
30	<i>20</i>	<i>25</i>	<i>25</i>	<i>25</i>		

OBSERVER'S NAME (PRINT) *Richard N Westbrook*
 OBSERVER'S SIGNATURE *Richard Westbrook* DATE *5/10/88*
 ORGANIZATION *ANALYTICAL TESTING CONSULTANTS, INC.*
 CERTIFIED BY *State of Ga.* DATE *March 88*

ADDITIONAL INFORMATION

POSTTEST MODULE CALIBRATION CALCULATION

DATE 5/19/88
 P BAR 29.55
 MODULE ID RNW#1
 VACUUM 5
 BY FINK

ORIFICE	Vw	Vd	Tw	Td	TIME	D H@	Y
1	5.95	6.03	75	81	10	1.603164	0.995322
1	5.95	6.09	75	85	10	1.591398	0.992802
1	5.96	6.11	75	87	10	1.580263	0.994853
						1.591608	0.994326

PRIMARY MODULE CALIBRATION CALCULATION

DATE 5/9/88
P BAR 30.1
MODULE ID RNW#1
BY POOLE

ORIFICE	Vw	Vd	Tw	Td	TIME	D H@	Y
0.5	4.54	4.58	72	75	10	1.351513	0.995640
1	5.9	6	72	77	10	1.594548	0.990156
1.5	7.27	7.35	72	79	10	1.569458	0.998471
2	8.39	8.41	72	81	10	1.565398	1.009566
3	10.08	10.31	72	83	10	1.620751	0.990647
						1.540334	0.996896

NOZZLE CALIBRATION DATA FORM

Box 1

Date 2/5/88 Calibrated by P. G. Gable

Nozzle identification number	Nozzle Diameter ^a			ΔD ^b mm (in.)	D_{avg} ^c
	D_1 mm (in.)	D_2 mm (in.)	D_3 mm (in.)		
1/8 #1	.130	.127	.129	.003	.129
3/16 #1	.188	.187	.188	.001	.188
1/4 #1	.250	.250	.249	.001	.250
5/16 #1	.312	.313	.315	.003	.313
3/8 #1	.375	.375	.375	0	.375
1/2 #1	.500	.500	.501	.001	.500

where:

^a $D_{1,2,3}$ = three different nozzle diameters, mm (in.); each diameter must be within (0.025 mm) 0.001 in.

^b ΔD = maximum difference between any two diameters, mm (in.), $\Delta D \leq (0.10 \text{ mm}) 0.004 \text{ in.}$

^c D_{avg} = average of D_1 , D_2 , and D_3 .

NOZZLE CALIBRATION DATA FORM

Box 2

Date 2/5/88 Calibrated by P. Cole

Nozzle identification number	Nozzle Diameter ^a			ΔD , ^b mm (in.)	D_{avg} ^c
	D_1 , mm (in.)	D_2 , mm (in.)	D_3 , mm (in.)		
1/8 #2	— BACK ORDER ON Replacement			—	—
3/16 #2	.187	.188	.188	.001	.189
1/4 #2	.249	.250	.250	.001	.250
1/4 #3	.248	.251	.251	.003	.250
5/16 #2	.312	.313	.314	.002	.313
3/8 #2	.376	.375	.375	.001	.375
1/2 #2	.502	.502	.503	.001	.502

where:

^a $D_{1,2,3}$ = three different nozzle diameters, mm (in.); each diameter must be within (0.025 mm) 0.001 in.

^b ΔD = maximum difference between any two diameters, mm (in.), $\Delta D \leq (0.10 \text{ mm}) 0.004 \text{ in.}$

^c D_{avg} = average of D_1 , D_2 , and D_3 .

TYPE S PITOT TUBE INSPECTION DATA FORM

701

Pitot tube assembly level? yes no

Pitot tube openings damaged? yes (explain below) no

$\alpha_1 = 0^\circ (<10^\circ)$, $\alpha_2 = 0^\circ (<10^\circ)$, $\beta_1 = 0^\circ (<5^\circ)$,

$\beta_2 = 0^\circ (<5^\circ)$

$\gamma = 0^\circ$, $\theta = 0^\circ$, $A = 10$ (in.)

$z = A \sin \gamma = 0$ (in.); <0.32 cm ($<1/8$ in.),

$w = A \sin \theta = 0$ (in.); $<.08$ cm ($<1/32$ in.)

$P_A = .5$ (in.) $P_B = .5$ cm (in.)

$D_t = 3/8$ (in.)

Comments: Purchased New from Air Nova

Calibration required? yes no

WDF

10/26/87

TYPE S PITOT TUBE INSPECTION DATA FORM

#702

Pitot tube assembly level? yes no

Pitot tube openings damaged? yes (explain below) no

$\alpha_1 = 0^\circ (<10^\circ)$, $\alpha_2 = 0^\circ (<10^\circ)$, $\beta_1 = 0^\circ (<5^\circ)$,

$\beta_2 = 0^\circ (<5^\circ)$

$\gamma = 0^\circ$, $\theta = 0^\circ$, $A = 1.0$ in. (in.)

$z = A \sin \gamma = 0$ cm (in.); <0.32 cm ($<1/8$ in.),

$w = A \sin \theta = 0$ cm (in.); $<.08$ cm ($<1/32$ in.)

$P_A = .5$ in. $P_B = .5$ in.

$D_t = 3/8$ in.

Comments: Purchase New from Air Nova

Calibration required? yes no

WDF

10/26/87

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 11-10-87 Thermocouple number 7D1
 Ambient temperature 73 °F Barometric pressure 29.33 in. Hg
 Calibrator M^cCombs Reference: mercury-in-glass

Omega Lead 2 other _____

Reference point number ^a	Source ^b (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Temperature difference, % ^c
	Refrigerator	39	39	
	Ambient	73	73	
	Telco oven	110	111	
		143	144	≥ 1
		175	175	
		204	204	
		220	220	
		253	252	< 1
		289	289	
		324	325	≥ 1

^aEvery 30°C (50°F) for each reference point.

^bType of calibration system used.

^c
$$\left[\frac{(\text{ref temp, } ^\circ\text{C} + 273) - (\text{test thermom temp, } ^\circ\text{C} + 273)}{\text{ref temp, } ^\circ\text{C} + 273} \right] 100 < 1.5\%$$

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 11-10-87 Thermocouple number 7D2

Ambient temperature 72 °F Barometric pressure 29.32 in. Hg

Calibrator McCombs Reference: mercury-in-glass

Omega Lead 3 other _____

Reference point number ^a	Source ^b (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Temperature difference, % ^c
	Refrigerator	41	41	
	Ambient	72	72	
	Telco Oven	118	118	
		216	216	
		268	268	
		315	315	
		358	358	

^aEvery 30°C (50°F) for each reference point.

^bType of calibration system used.

^c
$$\left[\frac{(\text{ref temp, } ^\circ\text{C} + 273) - (\text{test thermom temp, } ^\circ\text{C} + 273)}{\text{ref temp, } ^\circ\text{C} + 273} \right] 100 \leq 1.5\%$$