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.

Commonwealth of Pennsylvania
Environmental Resources
November 21, 1990

Subject: Source Test Review

To: Data File
Marsh Asphalt, Inc.
Connellsville Township, Fayette County

From: John S. Pitulski
Air Quality Program Specialist
Division of Technical Services and Monitoring
Bureau of Air Quality Control

Through: Chief, Source Testing and Monitoring Section

Marsh Asphalt, Inc. operates a 300 ton/hour batch-mix asphalt production plant at the aforementioned location. The aggregate dryer section of the operation is heated by a propane gas burner. Gaseous emissions from the plant are controlled by a cyclone collector and a fabric filter unit built by Hot Mix Manufacturing, Inc.

On September 20, 1990, three particulate emission tests were conducted by Comprehensive Safety Compliance, Inc. at the exhaust stack servicing the fabric collector. The tests appear to have been conducted in accordance with all applicable test methods and are acceptable to the Department.

The allowable particulate emission rates for the tests were incorrectly calculated using the asphalt production rates during each test period. I have correctly calculated the allowable rates using the aggregate feed rate during each test as outlined in PADER Chapter 123.13(b). The results are reflected in the chart below. This error does not affect the compliance status of the source.

The following corrected data was extracted from the test reports

Test Run Number	1	2	3
Aggregate Feed Rate (tons/hr)	258.6	259.5	260.3
Asphalt Production Rate (tons/hr)	278	277	279
Volumetric Flowrate (dscfm)	32,557	32,065	31,933
Particulate Concentration (gr/dscf)	0.0165	0.0143	0.0135
Particulate Emission Rate (lb/hr)	4.60	3.90	3.70
Allowable Emission Rate (lb/hr)	16.63	16.66	16.68

cc: Richard Murray, Greensburg District Office
Joseph Pezze, Pittsburgh Regional Office
Permit File No. 26-303-003
EPA/RSL
Reading File - Stack Test
Doug Lesher

JEP:bad

PARTICULATE EMISSION TESTING
ASPHALT PLANT BAGHOUSE
MARSH ASPHALT COMPANY
COOLSPRING, PA

RECEIVED
OCT 22 1990
GBG - D.E.R.

Report to:

Mr. Frank Nazurek
Marsh Asphalt, Inc.
P. O. Box 550M
Uniontown, PA 15401

Report by:

Mr. Richard L. Campbell
Division Manager

Comprehensive Safety Compliance, Inc.
295 William Pitt Way
Pittsburgh, PA 15238

RECEIVED
OCT 29 1990
DER AIR QUALITY CONTROL
DIV. OF TECH. SERVICES

Report Disclaimer

"This report (Particulate Emission Testing) and the associated attachments and appendices has been produced and developed for and at the request of Marsh Asphalt Company. It conveys the findings of CSC as of the date noted herein. This report (etc.) is intended for the exclusive use of the Marsh Asphalt Company (including its employees, officers, and Board of Directors) and may not be used, referenced, or cited for any reason whatsoever (except by a regulatory agency for regulatory review) by any other individual, company, or party whether or not related to or associated with the Marsh Asphalt Company now or at any time in the future. Any such reliance, use, reference, or citation without the expressed authorization of CSC is expressly prohibited. Any other company, individual, or party relying upon, using, referencing, or citing this report does so at their own risk and detriment. No guarantee or warranty of whatever nature, whether expressed or implied by or in this report (etc.) which may flow to the Marsh Asphalt Company is granted or conveyed to, or may be assumed to have been granted to or conveyed to anyone else."

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INTRODUCTION

On September 20 and 21, 1990, particulate emission testing and opacity observations were performed on the Asphalt Plant Baghouse at Marsh Asphalt Company's plant in Coolspring, PA.

The test program was authorized by Mr. Rick Kessler of Marsh Asphalt Company. Testing was performed by Mr. Kevin Kennedy and Mr. Tom Smith and visible emission reading by Mr. Richard Campbell of Comprehensive Safety Compliance, (CSC) Inc. Testing and process operations were observed by Mr. Dick Murray of the Pennsylvania Department of Environmental Resources Air Pollution Control Bureau.

2.0 SUMMARY OF RESULTS

Table No. 1 below is a summary of Particulate Emission Data and Opacity Data from tests on the Asphalt Plant Baghouse.

Table No. 2 is a summary of flue gas parameters.

TABLE NO. 1

Particulate Emissions and Opacity Data

Test Data 1990	Test No.	Test Location	Particulate Emission Data			Opacity Data[c]		
			Conc.[a] Gr/dscf	Emission Rate[b] lb/hr.	Allowable lb/hr	Min. %	Max. %	Highest 6 min. Avg. %
9/20	BO-1	Baghouse Outlet	0.016	4.6	17.1	0	5	5
9/20	BO-2	Baghouse Outlet	0.014	3.9	17.1	0	10	5
9/21	BO-3	Baghouse Outlet	0.013	3.7	17.1	0	10	4

(a) Grains per dry standard cubic foot
(b) Pounds per hour
(c) Opacity data from EPA Method 9 observations

TABLE NO. 2

Summary of Flue Gas Parameters

Test Date 1990	Test No.	Test Location	Percent Moisture	Stack Temp. °F	Percent CO_2[a]	Percent O_2[b]	Flow Rates ACFM[c]	Flow Rates DSCFM[d]
9/20	BO-1	Baghouse Outlet	11.9	140	3.5	17.5	43,800	32,600
9/20	BO-2	Baghouse Outlet	11.5	147	3.4	17.0	43,400	32,000
9/21	BO-3	Baghouse Outlet	12.0	141	3.4	17.0	43,000	31,900

a. percent carbon dioxide by volume
b. percent oxygen by volume
c. actual cubic feet per minute
d. dry standard cubic feet per minute

3.0 PROCESS AND TEST PROGRAM DESCRIPTION

Process Description

The Marsh plant at Jumonville Road Uniontown has a Batch Asphalt plant manufactured by the Madsen Corporation. The process (as shown in Figure 1) begins with the loading of different sized aggregate from stockpiles, usually into four "cold" bins. From these bins calibrated vibratory feeders control the amounts of each aggregated falling onto a conveyor that leads to the inlet of the dryer. The function of the dryer is to remove surface moisture and heat the aggregate in order to be coated with asphalt cement in the pugmill. The dryer is an inclined rotary drum, 108 inches in diameter and 36 feet long, in which the aggregate is dried and heated by the propane gas burner. The dryer is designed with "flights" on the inside that tumble the aggregate and increase exposure to the hot gases. The burner is located at the aggregate discharge or low end of the dryer; therefore, the combustion gases flow counter current to aggregate flow. The effluent gases from the dryer are directed to a primary cyclone and fabric filter secondary collector. The plant is rated for production of about 300 tons/hr. A summary of process data for each test is provided in Table No. 3. Detailed process data is provided in Appendix D.

Emission Control System

Emissions from the plant are controlled by a baghouse manufactured by Hot Mix Maunfacturing, Inc. of Louisville, KY. It is a Model # 630-14EI. It contains 630 15 foot by 6 inch bags which provides 14,000 square feet of collection area. The bags are made of NOMEX.

The exhaust fan is a Phelps C-445 which is capable of pushing 66,700 ACFM. Emission control system presure drop data taken during testing is provided in Appendix D.

Test Program Description

Testing was conducted on the Particulate Emissions from the Asphalt Plant Baghouse.

The sampling location is shown in Figure No. 2 Sample duration was 72 minutes for all three tests.

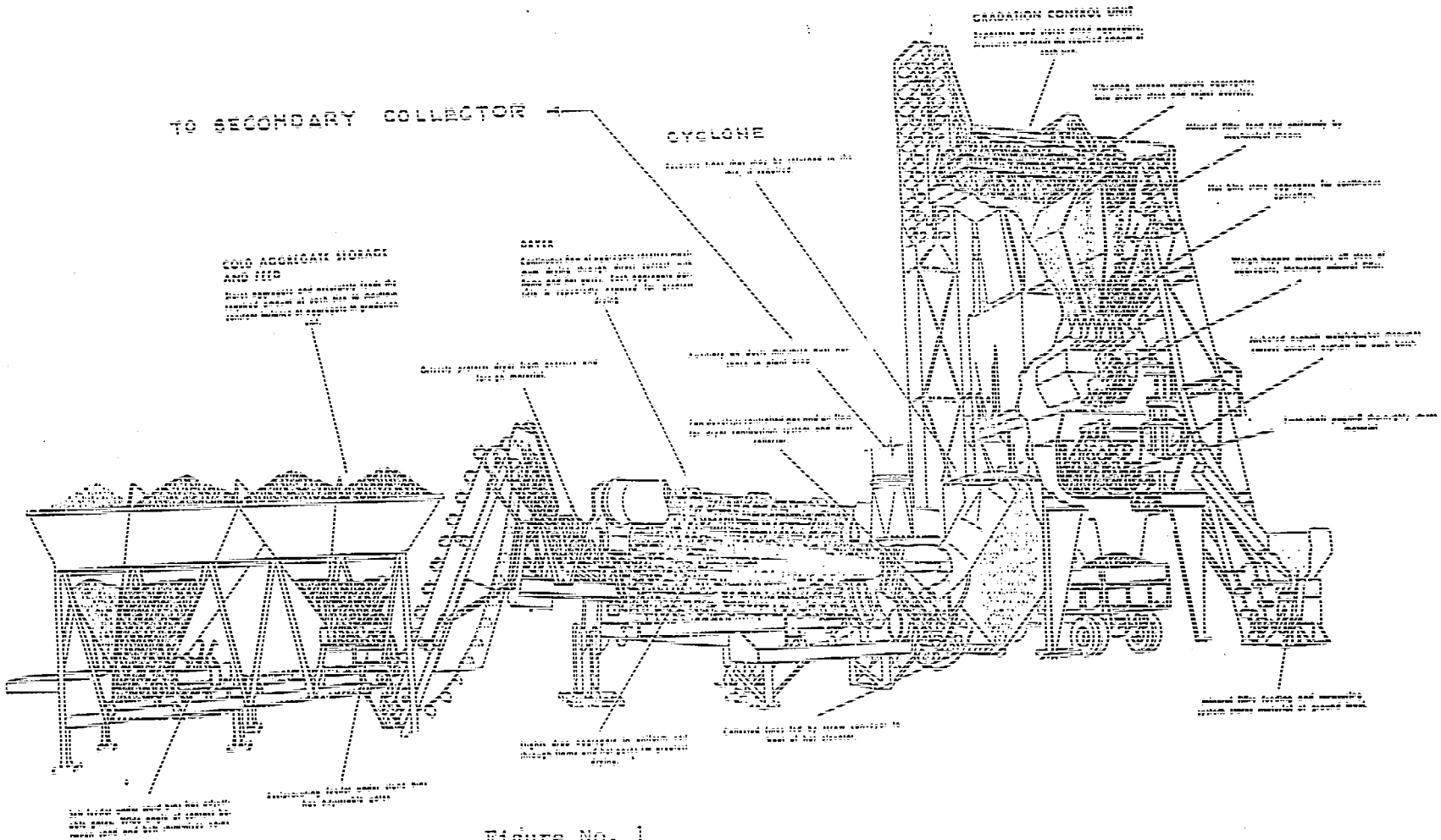


Figure No. 1

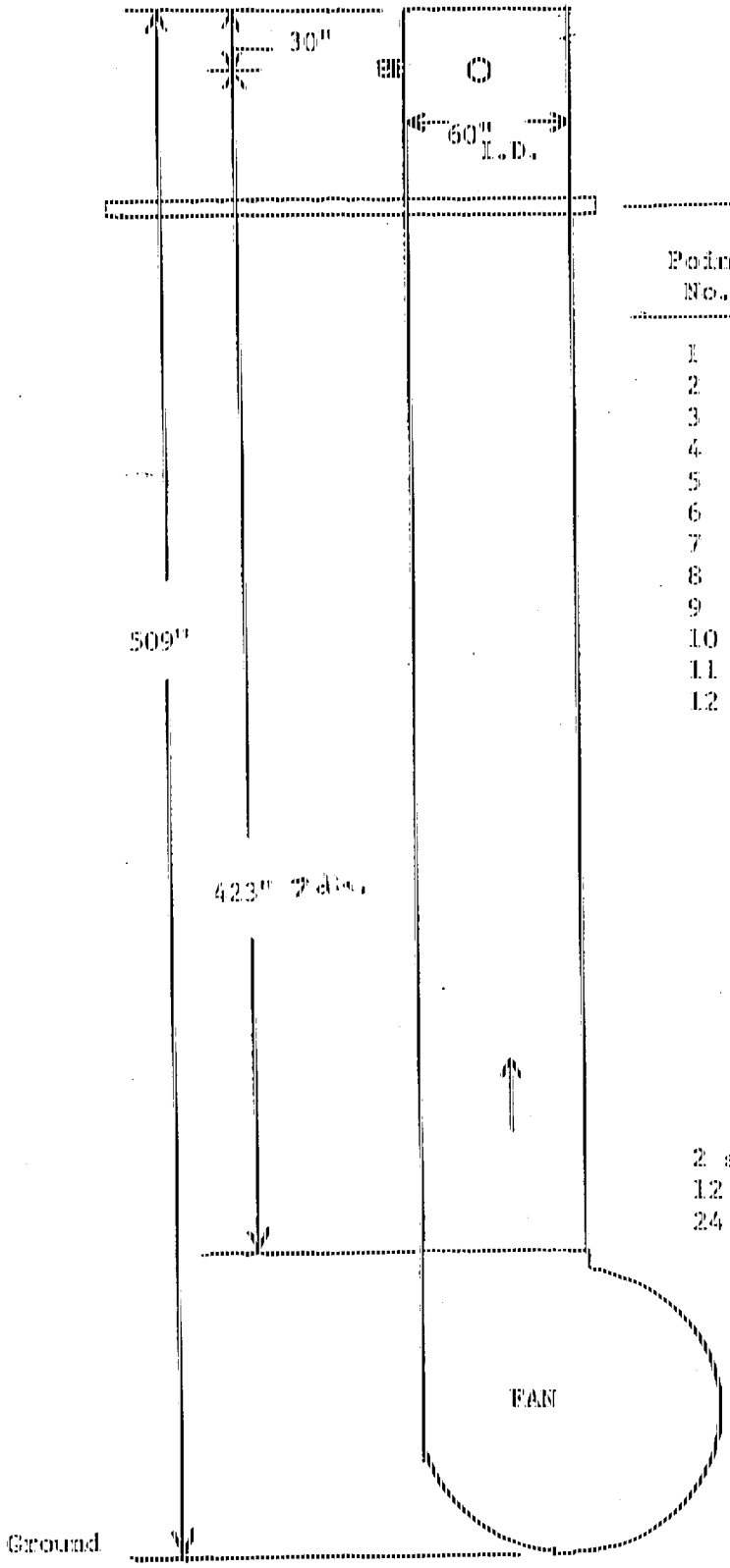
Process Schematic

TABLE NO. 3

Asphalt Plant Production Rates

DATE 1990	TEST NO	PRODUCTION RATE TONS/HR	TYPE MIX
9/20	BO-1	278	Top
9/20	BO-2	277	Top
9/21	BO-3	278	Top

More detailed process data is provided in Appendix D.



Sample Point Location

Point No.	Percent of Diameter	Point Location Inches
1	2.1	1.3
2	6.7	4.0
3	11.8	7.1
4	17.7	10.6
5	25.0	15.0
6	35.6	21.4
7	64.4	38.6
8	75.0	45.0
9	82.3	49.4
10	88.2	52.9
11	93.3	56.0
12	97.9	58.7

Circular Duct

2 sample ports 90° apart
12 points per port
24 total sample points

FIGURE NO. 2

Marsh Asphalt
Baghouse Outlet
Sampling Location

Method 5 Sampling Procedures

After selecting the sampling site and the minimum number of traverse points, the stack pressure, temperature, moisture and range of velocity head were measured according to the procedures described in the Federal Register*.

Approximately 200 grams of silica gel was weighed in a sealed impinger prior to each test. Glass fiber filters** (4 inch diameter) desiccated for at least 24 hours, dried at 105°C for 2 hours and weighed to the nearest 0.1mg. on an analytical balance. One hundred ml of distilled water was placed in each of the first two impingers; the third impinger was initially empty; and the impinger containing the silica gel was placed next in series. The sampling train was leak-checked at the sampling site prior to each test run by plugging the inlet to the nozzle and pulling 15-inch Hg vacuum, at the conclusion of the test by plugging the inlet to the nozzle and pulling a vacuum equal to the highest vacuum reached during the test run. A more detailed description of the sampling and analytical procedures is provided in Appendix B.

J. Formulas and Calculations

NOMENCLATURE AND DIMENSIONS

A_s = cross-sectional area of stack, ft^2

A_n = area of sampling nozzle, ft^2

B_{ws} = proportional by volume of water vapor in the gas stream, dimensionless

C_p = pitot tube coefficient, diamensionless = .84

C_s = concentration of particulate matter in stack gas, gr/scf,dry basis

%CO = percent of carbon monoxide by volume, dry basis

$\%CO^2$ = percent of carbon dioxide by volume, dry basis

H = average pressure drop across the orifice meter, inches of H_2O

I = percent of isokinetic sampling

M_d = dry molecular weight, lb/lb-mole

M_n = total amount of particulate matter collected, mg.

M_s = molecular weight of stack gas (wet basis), lb/lb-mole

$\%N_2$ = percent of nitrogen by volume, dry basis

$\%O_2$ = percent of oxygen by volume, dry basis

p = velocity head of stack gas, inches of H_2O

P_{bar} = barometric pressure, inches of Hg

P_s = absolute stack gas pressure, inches of Hg

pmr = particulate matter emission rate, lbs/hr

Q_s = volumetric flow rate, wet basis, standard conditions

$Q_{s\,std}$ = volumetric flow rate, dry basis, standard

T_m = average temperature of dry gas meter, °R

T_s = average temperature of stack gas, °R

V_{l_c} = total volume of liquid collected in impingers and silica gel, ml.

V_m = volume of sample through the dry gas meter at meter conditions, ft^3

$V_{m_{std}}$ = volume of gas sample through the dry gas meter at standard conditions, ft^3

V_s = stack gas velocity at stack conditions, fps

$V_{w_{std}}$ = volume of water in the gas sample at standard conditions, ft^3

θ = total sampling time, minutes

Note: Standard conditions = $70^{\circ}F$ and 29.92 inches of Hg.

Formulas for Particulate Emissions Calculations

1. Volume of dry gas sampled corrected to standard conditions. Note: V_m must be corrected for leakage if any leakage rates exceed L_a.)

$$V_{m_{std}} = 17.64 \times V_m \times Y \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m} \right] =$$

2. Volume of water vapor at standard conditions, ft^3.

$$V_{wc_{std}} = 0.04707 \times V_{1_c} =$$

3. Moisture content in stack gas.

$$B_{ws} = \frac{V_{wc_{std}}}{V_{m_{std}} + V_{wc_{std}}}$$

4. Dry molecular weight of stack gas.

$$M_d = 0.440\ (\%\ CO_2) + 0.320\ (\%O_2) + 0.280\ (\%\ N_2 + \%\ CO) =$$

5. Molecular weight of stack gas

$$M_s = M_d\ (1-B_{ws}) + 18\ B_{ws} =$$

6. Stack velocity at stack conditions, fps

$$V_s = 85.49 \times C_p \times \sqrt{\Delta p \text{ avg.}} \times \sqrt{\frac{T_s}{P_s \; M_s}} =$$

7. Stack gas volumetric flow rate at stack conditions, ACFM

$$Q_s = 60 \times V_s \times A_s$$

8. Dry stack gas volumetric flow rate at standard conditions, DSCFM.

$$Q_{s_{std}} = 17.64 \times Q_s \times \frac{P_s}{T_s} \times (1-B_{ws}) = \text{DSCFM} \times 60 = \text{DSCFH}$$

9. Concentration in g/scf

$$C'_s = 0.001 \text{ g/mg} \times \frac{M_n}{V_{m_{std}}} =$$

10. Concentration gr/dscf

$$C_s = C'_s \times 15.43$$

11. Particulate mass emission rate, lbs/hr.

$$\text{pmr} = \frac{C_s \times Q_{s_{std}}}{454}$$

12. Isokinetic variation

$$I = \frac{100 \; T_s}{60} \left[0.002669 \; \frac{V_{1_c}}{0} + \frac{\frac{V_m}{T_m}}{V_s} \; \frac{P_{bar}}{P_s} \; \frac{\Delta H}{A_n \; 13.6} \right] =$$

SUMMARY OF PARTICULATE RESULTS

1 TEST NO.	BO-1	BO-2	BO-3
2 TEST DATE	9/20/90	9/20/90	9/20/90
3 BAROMETRIC PRESS. IN. HG.	28.7	28.7	28.7
4 AVERAGE VELOCITY HEAD IN. H2O	0.598	0.590	0.587
5 STATIC PRESSURE IN. H2O	0.34	0.34	0.34
6 AVERAGE STACK TEMP. DEG. F	140	147	141
7 AVERAGE ORIFICE DIFF. IN. H2O	4.5	4.3	4.3
8 AVERAGE METER TEMP. DEG. F	95	114	89
9 METERBOX CORRECTION FACTOR Y	0.995	0.995	0.995
10 SAMPLE VOLUME ACF.	86.294	85.201	85.736
11 SAMPLE TIME MINUTES	72.0	72.0	72.0
12 CONDENSATE ML.	210.0	196.0	210.0
13 DESICCANT GAIN .GMS.	17.4	13.3	19.5
14 PERCENT CO2	3.5	3.4	3.4
15 PERCENT O2	17.5	17.0	17.0
16 PERCENT N2	79.0	79.6	79.6
17 STACK AREA SQ. FT.	19.635	19.635	19.635
18 NOZZLE AREA SQ. FT.	0.000707	0.000707	0.000707
19 TOTAL PART.WT. mg	84.5	70.2	69.6
20 Vm std (SCF).....	79.226	75.595	79.534
21 Vw std (CF).....	10.704	9.852	10.803
22 Bws % (fraction).....	0.119	0.115	0.120
23 Md (Dry mol. wt.).....	29.260	29.224	29.224
24 Ms (Stack Mol. Wt.).....	27.920	27.930	27.882
25 Vs (Fps).....	37.144	36.853	36.516
26 Qs (Acfm).....	43759	43417	43019
27 Qs std (Dscfm).....	32557	32065	31933
28 Cs (G/scf).....	0.001067	0.000929	0.000875
29 Cs (Gr/scf).....	0.0165	0.0143	0.0135
30 Pmr (Lbs/hr).....	4.6	3.9	3.7
31 Isokinetics (%).....	93.9	90.9	96.1

Allowable Emission Rate Calculations

Formula,

$A = 0.76E^{0.42}$, where:
A = Allowable emissions in pounds per hour
E = Emission index = F x W pounds per hour
E = PRocess factor in pounds per unit, and
W = Production or charging rate in units per hour
F = 6 lbs/ton
W = Tons/hr

Test No. 1

$$A = 0.76\ (6 \times 278)^{0.42} = 17.1 \text{ lbs/hr}$$

Test No. 2

$$A = 0.76\ (6 \times 277)^{0.42} = 17.1 \text{ lbs/hr}$$

Test No. 3

$$A = 0.76\ (6 \times 278)^{0.42} = 17.1 \text{ lbs/hr}$$

B. SAMPLING METHODOLOGY & EQUIPMENT CALIBRATION

SAMPLE AND VELOCITY TRAVERSES FOR STATIONARY SOURCES
EPA METHOD 1

The following method was used in this test program. Sampling procedures follow those described in EPA Method 1 of the Federal Register*.

SELECTION OF THE MEASUREMENT SITE

The velocity measurement were taken at (**) stack (or duct) diameters downstream and (**) diameters upstream from any flow disturbances.

CHOOSING THE NUMBER OF TRAVERSE POINTS (non-Cyclonic flow)

Particulate Traverse Sampling

At least twelve (12) traverse points were sampled for circular (or rectangular) stack diameters greater than .61 meters. At least eight (8) traverse points were sampled for circular stacks and nine (9) points for rectangular stacks for equivalent diameters for .30 to .61 meters. For other stack diameters, Figure 1-1 was referred to.

Non-Particulate Traverse Sampling

The above procedure was used except that Figure 1-2 is substituted for Figure 1-1.

CROSS SECTIONAL TRAVERSE POINT LOCATIONS

The traverse points were located on two (2) perpendicular diameters. For particulate traverse samples, on of the above diameters was positioned in the plane containing the greatest concentration variation.

Circular Stacks

EPA Method 1, Figure 1-3 and Table 1-2 was referred to.

Rectangular Stacks

Using Figure 1-4 and Table 1-1 a rectangular grid, sectioned into as many equal areas as there are traverse points, was constructed. A sample was taken at the center of each elemental area in the grid.

No traverse points were located within 2.5 centimeters of the stack wall for stack diameters greater than .61 meters. For stack diameters equal to or less than .61 meters, no traverse points were located within 1.3 centimeters. For both of the above cases, where the sample nozzle inside diameter was greater than the adjusted distances, the larger distance was used.

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*Federal Register, CFR 40, Part 60, July 1, 1989
** Check sampling location schematic included.

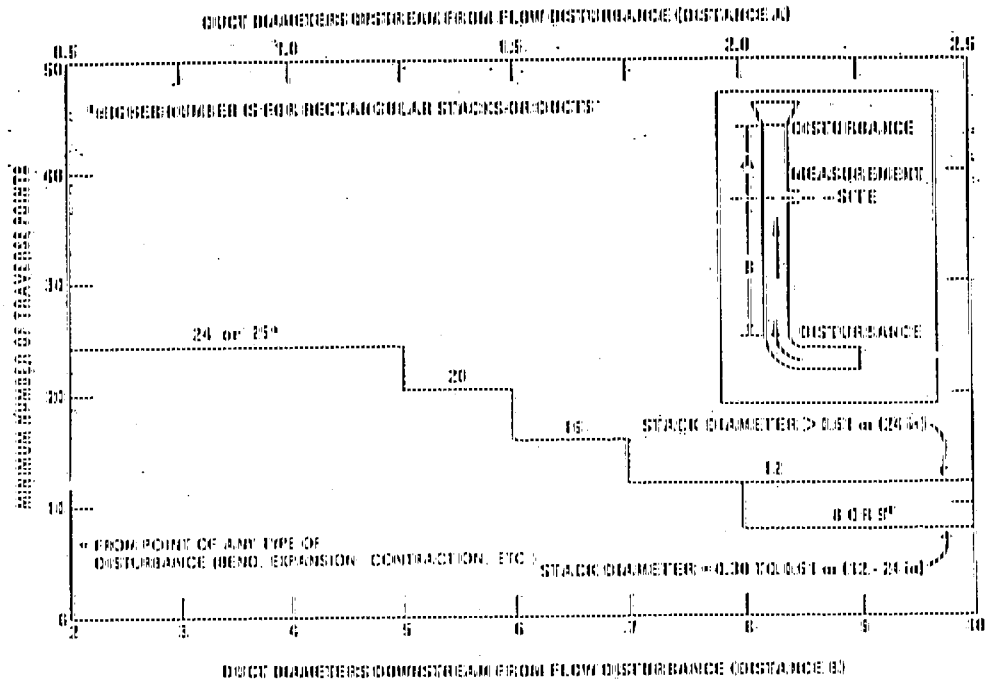


Figure 1-2. Minimum number of traverse points for particulate traverses.

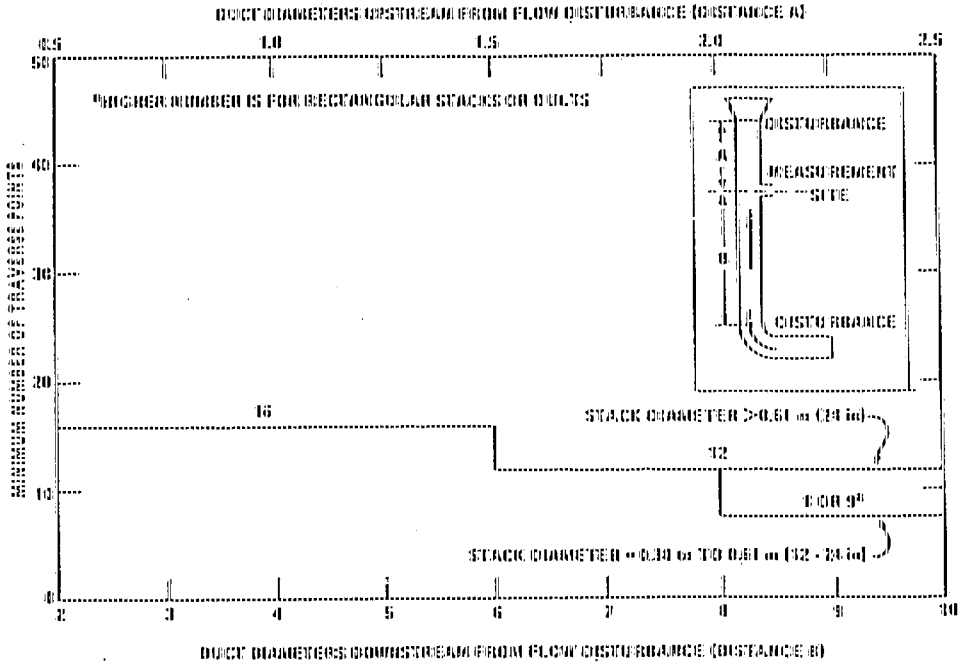


Figure 1-2. Minimum number of traverse points for velocity (nonparticulate) traverses.

TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

(Percent of stack diameter from inside wall to traverse point)

Traverse point number on a diameter	Number of traverse points on a diameter—											
	2	4	6	8	10	12	14	16	18	20	22	24
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5			85.4	67.7	34.2	25.0	20.1	16.9	14.6	12.9	11.6	10.5
6			95.6	80.6	65.8	35.6	26.9	22.0	18.8	16.5	14.6	13.2
7				89.5	77.4	64.4	36.8	28.3	23.6	20.4	18.0	16.1
8				96.8	85.4	75.0	63.4	37.5	29.6	25.0	21.8	19.4
9					91.8	82.3	73.1	62.5	38.2	30.0	26.2	23.0
10					97.4	88.2	79.9	71.7	61.8	38.8	31.5	27.2
11						93.3	85.4	78.0	70.4	61.2	39.3	32.3
12						97.9	90.1	83.1	76.4	69.4	60.7	39.8
13							94.3	87.5	81.2	75.0	68.5	60.2
14							98.2	91.5	85.4	79.8	73.8	67.7
15								95.1	89.1	83.5	78.2	72.8
16								98.4	92.5	87.1	82.0	77.0
17									95.6	90.3	85.4	80.6
18									98.6	93.3	88.4	83.9
19										95.1	91.3	86.8
20										96.7	94.0	89.5
21											96.5	92.1
22											98.9	94.5
23												96.8
24												98.9

TRAVERSE POINT	DISTANCE, % of diameter
1	4.4
2	14.6
3	29.6
4	70.4
5	85.4
6	95.6

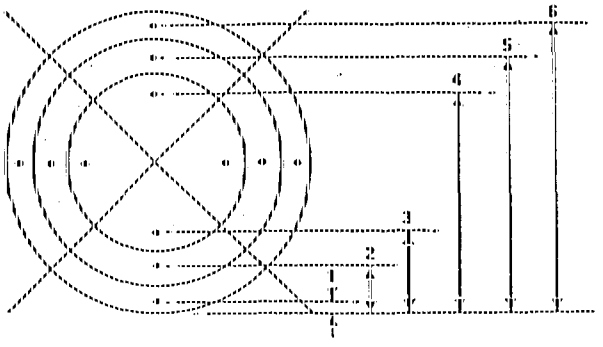


Figure 1-3. Example showing circular stack cross section divided into 12 equal areas, with location of traverse points indicated.

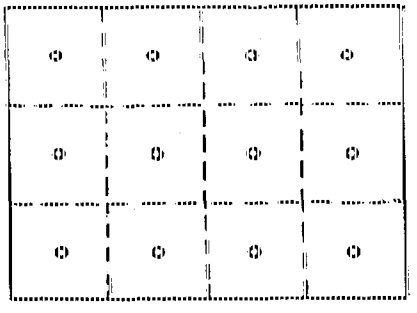


Figure 1-4. Example showing rectangular stack cross section divided into 12 equal areas, with a traverse point at centroid of each area.

Verification of the Absence of Cyclonic Flow through Stacks

For any stack where there existed a possibility of cyclonic flow, a test for the presence of cyclonic flow was performed using a manometer and Type S pitot tube.

The manometer was leveled and zeroed before the pitot tube was connected to the probe and positioned at each traverse point. The pitot tube was rotated (if necessary) until a null reading was obtained. All rotation angles were assigned absolute values. When no rotation was necessary, a value of 0 degrees was assigned. The values were summed, and the resultant angle called alpha ( ). Twenty (20 degrees was the limit of acceptability of the measurement locations for the average value of alpha with a Standard Deviation of ten (10) degrees or less.

A minimum of 24 traverse points for circular ducts and 42 points for rectangular ducts were used in the determination of gas flow angles. When the absence of cyclonic gas flow was verified, these same points were used to obtain velocity measurements.

EPA METHOD 2

DETERMINE OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE
EPA METHOD 2

The average velocity in a stack (or duct) was determined from the gas' density and average velocity head with a Type S pitot tube and stack gas flow was quantified.

SAMPLING APPARATUS

The apparatus consisted of the following equipment:

Pitot Tube - Type S pitot tube that meet all geometry standards was used to monitor stack gas velocity.

Draft Gauge - An inclined manometer made by Dwyer with readability of 0.01 inches H_2O in the 0-1 inch range was used.

Temperature Gauge - Included a thermocouple and digital readout capable of measuring temperatures to within 1.5% of the minimum stack temperatures.

Barometer - A barometer capable of measuring atmospheric pressure to within 2.5 mm Hg.

Gas Density Determination Equipment - Fyrite analyzer.

SAMPLING PROCEDURE

The apparatus was set up as illustrated in Figure 1.

The pretest leak-check was conducted for both the impact and static openings of the Pitot tube.

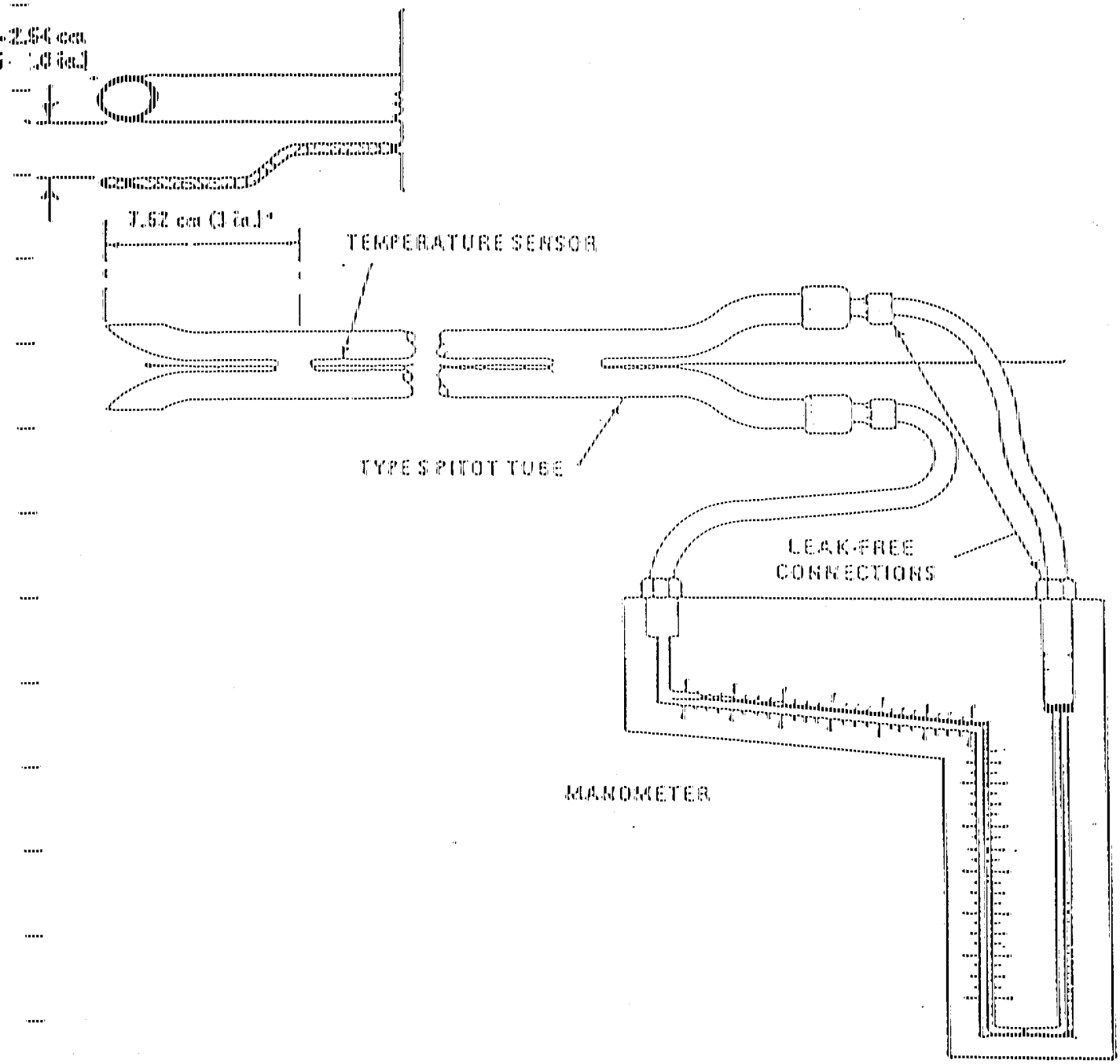
After adjusting the manometer level and zero, the velocity head and temperature were measured for each traverse point and recorded on the data sheet.

In addition, the static pressure in the stack was measured and the atmospheric pressure recorded.

The stack gas dry molecular weight was determined using EPA Method 3.

The moisture content was obtained using either EPA Method 4 or EPA Method 5.

The cross sectional area of the stack (or duct) at the sampling location was measured and recorded.



EPA Method 2

Flow Measurement System

EPA METHOD 3

GAS ANALYSIS FOR CARBON DIOXIDE, OXYGEN, EXCESS AIR & DRY

GAS ANALYSIS FOR CARBON DIOXIDE, OXYGEN, EXCESS AIR AND DRY MOLECULAR WEIGHT

EPA METHOD 3

The following method was used in this test program. Sampling procedures followed those described in EPA Method 3 of the Federal Register*.

SAMPLING APPARATUS

The gas analysis sampling train used in these tests at the exit stack meet the design specifications established by the Federal EPA and was assembled by Comprehensive Safety Compliance, Inc. (CSC) personnel.

The apparatus consisted of the following:

INTEGRATE SAMPLING: APPARATUS

PROBE - A stainless steel probe equipped with an in-stack or out-stack glass wool filter to remove particulate matter.

PUMP - A leak-free, diaphragm-type pump to transport sample gas to the flexible bag.

CONDENSER - A water-cooled condenser to remove excess moisture.

VALVE - A needle valve to adjust the sample flow rate.

SURGE TANK - A surge tank installed between the pump and rate meter to eliminate the pulsation effect of the diaphragm pump on the rate meter.

RATE METER - A rotameter capable of measuring flow rates to within $\pm$ 2% of a flow range of 500 to 1000 cubic centimeters per minute.

ORSAT ANALYZER - This combustible gas analyzer was used to determine dry molecular weight (DMW) for O_2, CO_2 and CO.

*Federal Register, CFR 40, Part 60, July 1, 1989

INTEGRATED SAMPLING

The sample train was set up as shown in Figure No. 1.

For single point sampling the sample point location was at the center of the cross-section or at least 1 meter away from the stack wall. The analyzer leak test was performed, and the flexible bag as well as the sample train was also leak tested.

For multi-point sampling at least eight traverse points were sampled in circular stacks with diameters less than .61 meters (9 points for rectangular stacks of .61 meter equivalent diameter). At least twelve points were sampled for all other cases.

Traverse point location was performed; with respect to EPA Method 1. All points were traversed and sampled for an equal length of time.

After positioning the probe and purging the sample line, the sample bag was connected to the train.

The sample was taken at a constant rate. The run was simultaneous will the lasted the total duration of the pollutant emission rate determination.

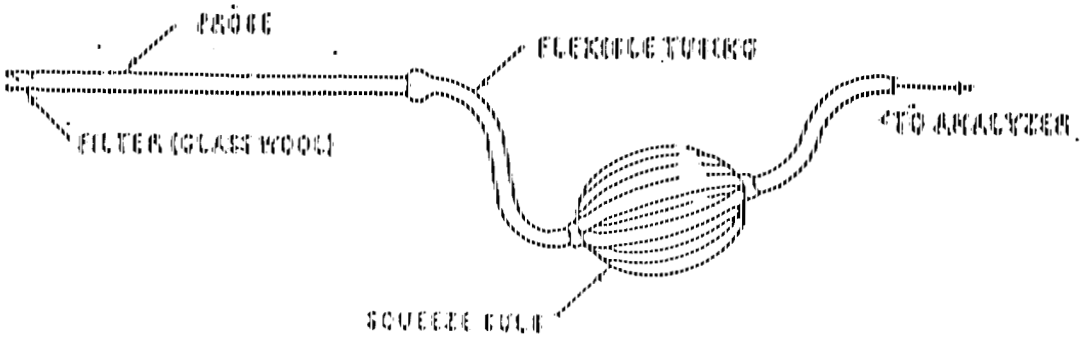
One flue gas sample was taken for each pollutant emission rate determination. Within eight hours the samples were analyzed for % CO_2 and O_2. The % N_2 and CO were determined and the dry molecular weight was calculated.

SAMPLE ANALYSIS

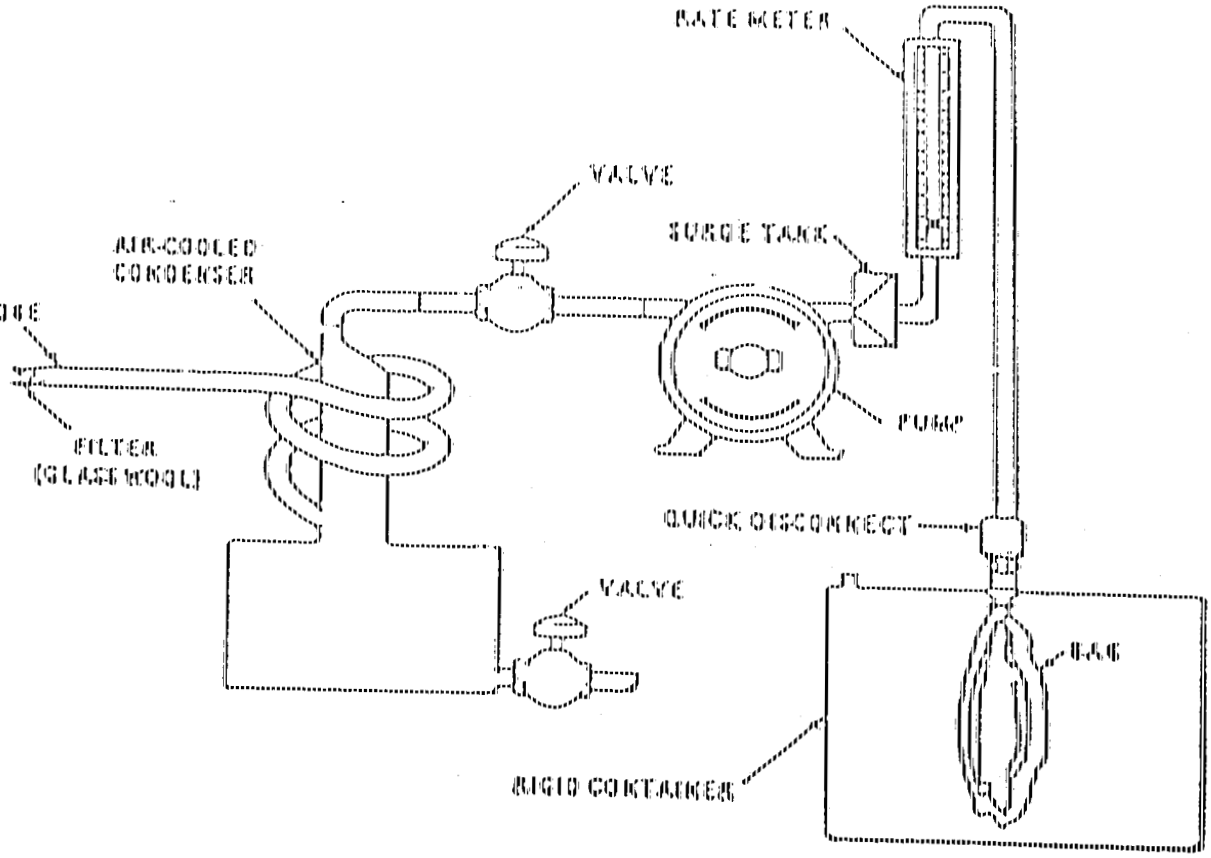
After a sample was drawn into a combustible gas analyzer, it was immediately analyzed for percent CO_2 and O_2. The percentage of the gas that is N_2 and Co was determined by subtracting the sum of the percents CO_2 and O_2 from 100 percent.

During sample analysis for a given gas, consecutive passes through the analyzer absorbing solutions were made until two consecutive readings were obtained. All values were averaged and recorded to the nearest 0.1%.

The analyzer was leak-tested before and after the analyses was performed.



Gas-sampling train.



EPA Method 3

Gas Composition Sampling Train

CO_2 ANALYSIS

The results of three analyses differ by no more than:

a) .3% volume when the CO_2 was greater than 4% of the total gas volume.

b) .2% volume when CO_2 was less than or equal to 4% of the total gas volume.

O_2 ANALYSIS

The analytical procedure was repeated until the results of three analyses differ by no more than:

a) .3% volume when O_2 was less than or equal to 15% of total gas volume.

b) .2% by volume when O_2 was greater than or equal to 15% of total gas volume.

CO AND N_2 ANALYSIS

For percent CO and N_2, the analytical procedure was repeated until three analyses differ by no more than .3%.

DETERMINATION OF THE DRY MOLECULAR WEIGHT

The DMW of each sample was determined using the following formula:

$$DMW = 0.440\ (\%\ CO_2) + .322\ (\%\ O_2) + .280\ (\%\ N_2 + \%\ CO)$$

EMISSION RATE CORRECTION FACTOR OR EXCESS AIR DETERMINATION

An EPA approved combustible gas analyzer was used to determine the excess air content in the stack emissions.

For single point and grab samples, the values obtained for % O_2, CO and N_2 were substituted in the following equation to determine the % excess air:

$$\%\ EA = \frac{\%\ O_2 - .5\%\ CO}{.264\%\ N_2 - (\%\ O_2 - .5\%\ CO)} \times 100\%$$

The fuel factor, F, calculated as follows:

$$F = \frac{20.9 - \%O_2}{\%CO_2}$$

*20.9 = The percent of O_2 by volume in ambient air.

SAMPLING PROCEDURE

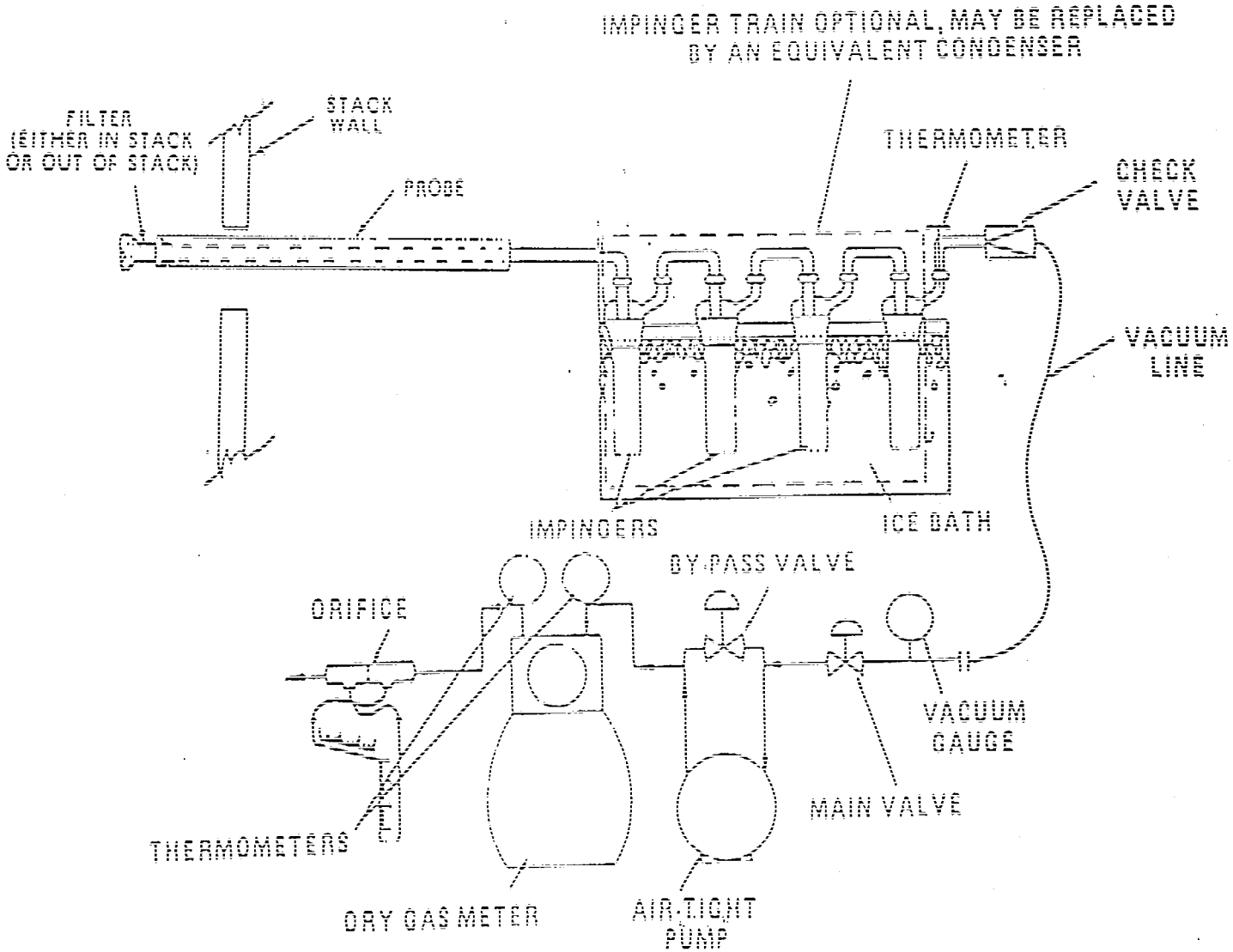
After selecting the sampling site and the minimum number of traverse points, the stack pressure and temperature was measured according to the procedures described in the Federal Register*.

Approximately 200 grams of silica gel were weighed in a sealed impinger prior to each test. One-hundred m l of distilled water was placed in each of the first two impingers; the third impinger was initially empty; and the impinger containing the silica gel was placed next in series. The train was set up with the probe as shown in Figure A-1. The sampling train was leak-checked at the sampling site prior to each test run by plugging the inlet to the nozzle and pulling a 15 inch Hg vacuum, and at the conclusion of the test by plugging the inlet to the nozzle and pulling a vacuum equal to the highest vacuum reached during the test run.

Crushed ice was placed around the impingers to keep the temperature of the gases leaving the last impinger at 68 F or less.

During sampling, stack gas and sampling train data were recorded at each sampling point and when significant changes in stack flow conditions occur. All sampling data were recorded on the Field Data Sheet.

*Federal Register, CFR 40, Part 60, July 1, 1989



Moisture sampling train-reference method.

SAMPLE RECOVERY PROCEDURE

The sampling train was moved carefully from the test site to the cleanup area. Sample fractions were recovered as follows:

1. The volume of water from the first three impingers was measured and recorded on the Recovery Data Sheet.

2. The silica gel from the fourth impinger was weighed and the gain recorded on the Sample Recovery Data Sheet with other pertinent data.

EPA METHOD 5

DETERMINATION OF PARTICULATE EMISSIONS

DETERMINATION OF PARTICULATE EMISSIONS
EPA METHOD 5

The following method was used in this test program. Sampling procedures followed those described in Method 5 of the Federal Register*.

SAMPLING APPARATUS

The particulate sampling train used in these tests at the exit stack met design specifications established by the Federal EPA and was assembled by Comprehensive Safety Compliance, Inc. (CSC) personnel. It consisted of:

Nozzle - Stainless steel (316) with sharp, tapered leading edge and accurately measured round opening.

Probe - Glass lined with a heating system capable of maintaining a minimum gas temperature of 250 F at the exit end during sampling.

Filter Holder - Pyrex glass with heating system capable of maintaining a filter temperature of approximately 250 F.

Draft Gauge - An inclined manometer made by Dwyer with readability of 0.01 inches H_2O in the 0-1 inch range was used.

Impingers - Four impingers connected in series with glass ball joints. The first, third and fourth impingers were of the Greensburg-Smith design, modified by replacing the tip with a 1/2 inch I.D. glass tube extending to 1/2 inch from the bottom of the flask.

Metering System - Vacuum gauge, leak-free pump, thermometers capable of measuring temperature to within 5 , calibrated dry gas meter, and related equipment, to maintain an isokinetic sampling rate and to determine sample volume. The dry gas meter is made by Rockwell and the fiber vane pump is made by Gast.

Barometer - Aneroid type to measure atmospheric pressures to ±0.1 inch Hg.

*Federal Register, CFR 40, Part 60, July 1, 1989

SAMPLING PROCEDURE

After selecting the sampling site and the minimum number of traverse points, the stack pressure, temperature, moisture and range of velocity head were measured according to the procedures described in the Federal Register*.

Approximately 200 grams of silica gel was weighed in a sealed impinger prior to each test. Glass fiber filters** (4 inch diameter) were desiccated for at least 24 hours, dried at 105 C for 2 hours and weighed to the nearest 0.1 mg on an analytical balance. One hundred ml of distilled water was placed in each of the first two impingers; the third impinger was initially empty; and the impinger containing the silica gel was placed next in series. The train was set up with the probe as shown in Figure A-1. The sampling train was leak-checked at the sampling site prior to each test run by plugging the inlet to the nozzle and pulling 15 inch Hg vacuum, and at the conclusion of the test by plugging the inlet to the nozzle and pulling a vacuum equal to the highest vacuum reached during the test run.

The pitot tube and line were leak-checked at the test site prior to an following the initial velocity traverse. The check was made by blowing into the impact opening of the pitot tube* until 3 or more inches of water were recorded on the manometer and then capping the impact opening and holding it for 15 seconds to assure it was leak free. The static pressure side of the pitot tube was leak checked using the same procedure, except suction was used to obtain the 3 inch H_2O manometer reading. Crushed ice was placed around the impingers to keep the temperature of the gases leaving the last impinger at 68 F or less.

During sampling, stack gas and sampling train data were recorded at each sampling point and when significant changes in stack flow conditions occurred. Isokinetic sampling rates were set throughout the sampling period with the said of a nomograph or calculator. All sampling were recorded on the Particulate Field Data Sheet.

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* Federal Register, CFR 40, Part 60, July 1, 1989
**934 AH type

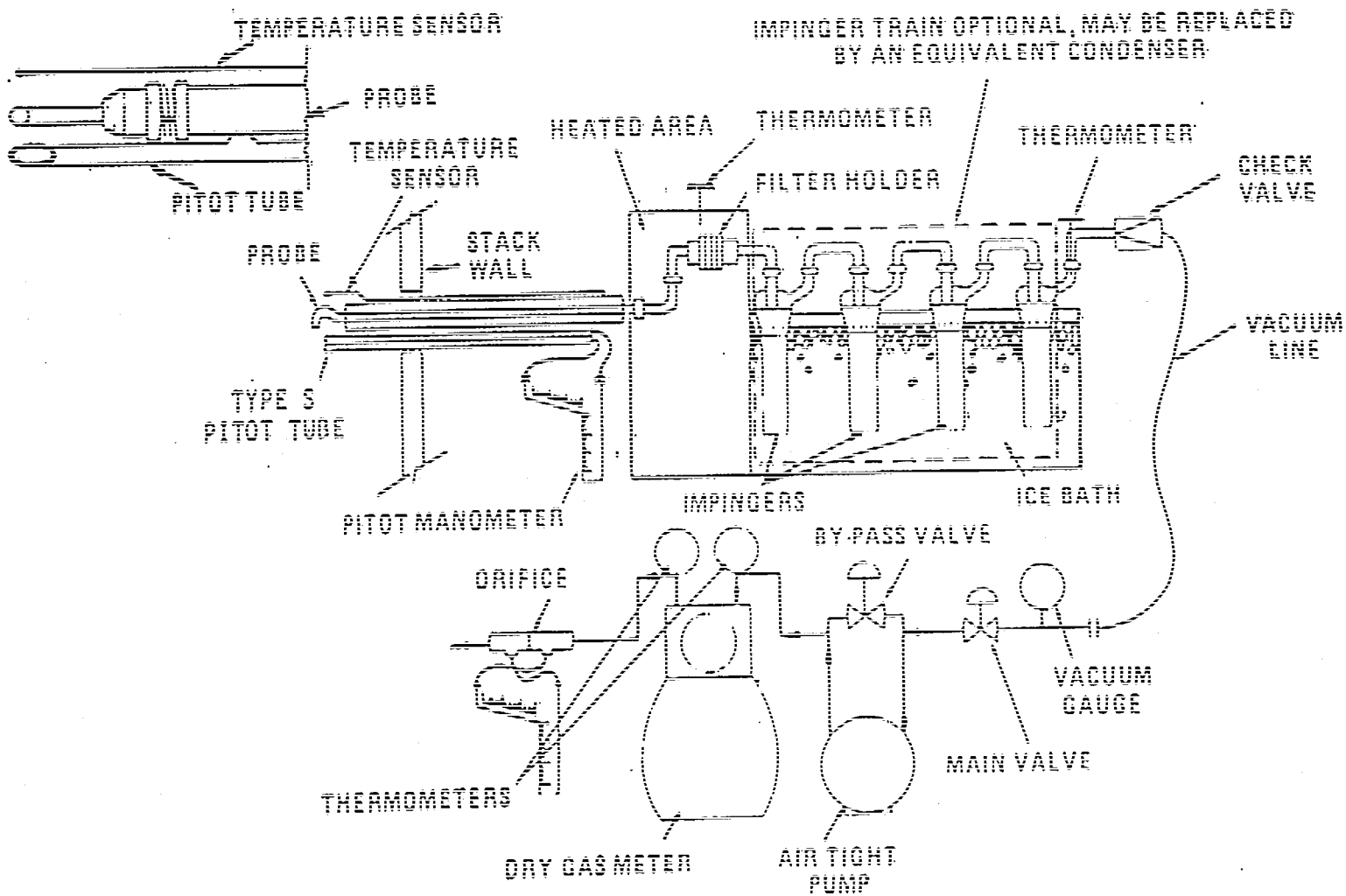


Figure 1. Schematic of Method 5 sampling train.

SAMPLE RECOVERY PROCEDURE

The sampling train was moved carefully from the test site to the cleanup area. Samples of the acetone and distilled water used in the sample recovery were taken for use as blanks. The volume of water from the first three impingers was measured. Sample fractions were recovered as follows:

Container No. 1 - The filter was removed from its holder and placed in a petri dish and sealed.

Container No. 2 - Loose particulate and H_2O washings from all sample-exposure surface prior to the filter were placed in a sample container, sealed and labelled. Particulate was removed from the probe with the aid of a brush and H_2O rinsing. The liquid level was marked after the container was sealed.

Container No. 3 - Loose particulate and acetone washings from all sample-exposure surface prior to the filter were placed in a sample container, sealed and labeled. Particulate was removed from the probe with the aid of a brush and acetone rinsing. The liquid level was marked after the container was sealed.

Container No. 4 - A minimum of 200 ml of acetone was taken for the blank analysis. The blank was obtained and treated in a similar manner as the acetone washing.

Container No. 5 - Distilled water in the impinger section of the sampling train was measured and placed in a sample container. The impingers and connecting glassware were rinsed with distilled H_2O and this rinse was added to the container for shipment to the laboratory.

Container No. 6 - The impinger section of the sampling train of the connecting glassware was rinsed with acetone and this rinse was put in a container for shipment to the laboratory.

Container No. 7 - A minimum of 200 ml of distilled water was taken for the blank analysis. The blank was obtained and treated in a similar manner as the water rinse.

The silica gel from the fourth impinger was weighed and the gain recorded on the Sample Recovery Data Sheet with other pertinent data.

ANALYTICAL PROCEDURES

The following procedures were used and follow the methods described in the DER Source Testing Manual*.

Container No. 1 - The filter and any loosed particulate matter from this sample container were placed into a tared glass weighing dish, baked at 105 C for 2 hours, desiccated for 24 hours to a constant weight and weighed to the nearest 0.1 mg.

Container No. 2 - The H_2O washings were transferred to a tared beaker and evaporated to dryness at 105 C temperature and pressure, desiccated for 24 hours to a constant weight, and weighed to the nearest 0.1 mg.

Container No. 3 - the acetone washings were transferred to a tared beaker and evaporated to dryness at ambient temperature and pressure, desiccated for 24 hours to a constant weight, and weighed to the nearest 0.1 mg.

Container No. 4 - The acetone blank was transferred to a tared breaker and evaporated to dryness at ambient temperature and pressure. The blank was then desiccated for 24 hours to a constant weight and weighed to the nearest 0.1 mg.

Container No. 5 - The contents of this container were filtered through 0.8-.22 micron tared filters to remove insoluble particulate. The filters and filtrates in tared breakers were evaporated to dryness at 105 C, then desiccated to a constant weight and weighed on an analytical balance to the nearest 0.1 mg.

Container No. 6 - The acetone was transferred to a tared beaker and evaporated to dryness at ambient temperature and pressure. The sample was then desiccated for 24 hours to a constant weight and weighed to the nearest 0.1 mg.

Container No. 7 - The distilled water blank was transferred to a tared beaker and evaporated to dryness at 105 C. The blank was desiccated to a constant weight and weighed on analytical balance to the nearest 0.1 mg.

The term "constant weight" means a difference of no more than 0.5 mg or 1% of total weight less tare weight, whichever is greater between two consecutive readings, with no less than 6 hours of desiccation between weighings.

EPA Method 9

Visual Determination of the Opacity of Emissions from Stationary Sources

Determination of Opacity of Emissions from
Stationary Sources

EPA Method 9

The following method was used in this test program. Observation procedures follow those described in EPA Method 9 of the Federal Register *.

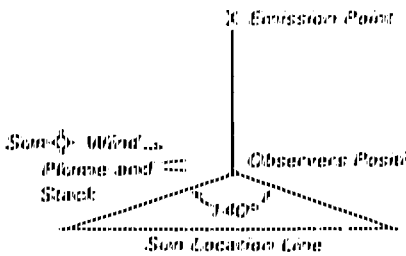
Observation Procedures

The opacity of emissions from stationary sources was determined visually by a qualified observer. The qualified observer stood at a distance sufficient to provide a clear view of the emissions with the sun oriented in the 140 sector to his back. Consistent with maintaining the above requirement, the observer made his observations from a position such that his line of vision was approximately perpendicular to the plume direction, and approximately perpendicular to the longer axis of the outlet. The observer recorded the name of the plant, emissions location, type facility, observer's name and affiliation, a sketch of the observer's position relative to the source, and the date on a field data sheet (Figure 1). The time, estimated distance to the emission location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), and plume background were recorded on a field data sheet at the time opacity readings were taken.

Opacity observations were made at the point of greatest opacity in the portion of the plume where condensed water vapor was not present. The observer did no look continuously at the plume, but momentarily at 15-seconds intervals.

SOURCE NAME			OBSERVATION DATE	START TIME	STOP TIME
ADDRESS					
CITY	STATE	ZIP			
PHONE	SOURCE ID NUMBER				
PROCESS EQUIPMENT	OPERATING MODE				
CONTROL EQUIPMENT	OPERATING MODE				
DESCRIBE EMISSION POINT					
START	STOP				
HEIGHT ABOVE GROUND LEVEL	HEIGHT RELATIVE TO OBSERVER				
START STOP	START STOP				
DISTANCE FROM OBSERVER	DIRECTION FROM OBSERVER				
START STOP	START STOP				
DESCRIBE EMISSIONS					
START	STOP				
EMISSION COLOR	PLUME TYPE CONTINUOUS ☐				
START STOP	FUGITIVE ☐ INTERMITTENT ☐				
WATER DROPLETS PRESENT	IF WATER DROPLET PLUME				
NO ☐ YES ☐	ATTACHED ☐ DETACHED ☐				
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED					
START	STOP				
DESCRIBE BACKGROUND					
START	STOP				
BACKGROUND COLOR	SKY CONDITIONS				
START STOP	START STOP				
WIND SPEED	WIND DIRECTION				
START STOP	START STOP				
AMBIENT TEMP.	WET BULB TEMP.	RH,percent			
START STOP					

Source Layout Sketch — Draw North Arrow



SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD	NUMBER OF READINGS ABOVE % WERE
RANGE OF OPACITY READINGS MINIMUM	MAXIMUM
OBSERVER'S NAME (PRINT)	
OBSERVER'S SIGNATURE	DATE
ORGANIZATION	
CERTIFIED BY	DATE
VERIFIED BY	DATE

COMMENTS

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE | DATE

If condensed water vapor was present within the plume as it emerged from the emission outlet, opacity observations were made beyond the point in the plume at which condensed water vapor was no longer visible. The observer recorded the approximate distance from the emission outlet to the point in the plume at which the observations were made.

If water vapor in the plume condensed and became visible at a distinct distance from the emission outlet, the opacity of emissions were evaluated at the emission outlet prior to the condensation of water vapor and the formation of the steam plume.

Opacity observations were recorded to the nearest 5 percent at 15-second intervals on an observational record sheet (Figure 1). A minimum of 24 observations were recorded. Each momentary observation recorded was deemed to represent the average opacity of emissions for a 15-second period.

Opacity was determined as an average of 24 consecutive observations recorded at 15-second intervals. The observations recorded on the record sheet were divided into sets of 24 consecutive observations. A set was composed of any 24 consecutive observations. For each set of 24 observations, the average was calculated by summing the opacity of the 24 observations and dividing this sum by 24.

To receive certification as a qualified observer, a candidate was tested and demonstrated the ability to assign opacity readings in 5 percent increments to 25 different black plumes and 25 different white plumes, with an error not to exceed 15 percent opacity on any one reading and an average error not exceed 7.5 percent opacity in each category.

The certification is valid for a period of 6 months, at which time the qualification procedure must be repeated by any observer in order to retain certification. The certification test consists of showing the candidate a complete run of 50 plumes-25 black plumes and 25 white plumes-generated by a smoke generator. Plumes within each set of 25 black and 25 white runs were presented in random order. The candidate assigned an opacity value to each plume and recorded his observation on a suitable form. At the completion of each run of 50 readings, the score of the candidate was determined. If a candidate failed to qualify, the complete run of 50 readings was repeated in any retest. The smoke test was administered as part of a smoke school and was preceded by training of familiarization runs of the smoke generator during which candidates were shown black and white plumes of known opacity.

METER BOX CALIBRATION DATA AND CALCULATION FORM

Date 8/6/90 Meter box number 443

Barometric pressure, P_b = 28.9 in. Hg Calibrated by Kevin Kennedy

Orifice manometer setting (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperatures: Wet test meter (t_w), °F	Temperatures: Dry gas meter Inlet (t_{d_i}), °F	Temperatures: Dry gas meter Outlet (t_{d_o}), °F	Temperatures: Dry gas meter Avg[a] (t_d), °F	Time (θ), min	Y_i	$\Delta H@_i$ in. H_2O
0.5	5	420.900 426.150	72 °F	108 120	79 83	97	12.10	.996	
1.0	5	426.260 431.560	73 °F	122 103	88 91	101	8.14	.990	
1.5	10	435.008 445.327	73 °F	133 105	92 79	102	13.00	1.017	
2.0	10	445.992 456.395	73 °F	111 115	80 84	97	8.30	.994	
3.0	10	456.934 467.498	73 °F	111 140	85 90	106	10.00	.998	
4.0	10	468.026 478.629	73 °F	112 140	86 90	107	8.39	.993	
							Avg	.998	

ΔH, in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d (P_b + \frac{\Delta H}{13.6})(t_w + 460)}$	$\Delta H@_i = \frac{0.0317\ \Delta H}{P_b\ (t_d + 460)} \left[\frac{(t_w + 460)\ \theta}{V_w}\right]^2$
0.5	0.0368	5(28.9)(557) / 5.25(28.99)(532) = .996	
1.0	0.0737	5(28.9)(561) / 5.30(28.97)(533) .990	
1.5	0.110	10(28.9)(562) / 10.327(29.01)(533) 1.017	
2.0	0.147	10(28.9)(557) / 10.453(29.05)(533) = .994	
3.0	0.221	10(28.9)(566) / 10.564(29.12)(533) .998	
4.0	0.294	10(28.9)(567) / 10.603(29.19)(533) .993	

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d.

Kevin Rowntree

POSTTEST DRY GAS METER CALIBRATION DATA FORM

Test numbers _____ Date 9/28/90 Meter box number 443 Plant _____

Barometric pressure, P_b = 29.45 in. Hg Dry gas meter number 806 Pretest Y .995

Orifice manometer setting, (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter: Inlet (t_{d_i}), °F	Temperature: Dry gas meter: Outlet (t_{d_o}), °F	Temperature: Dry gas meter: Average[a] (t_d), °F	Time (Θ), min	Vacuum setting, in. Hg	Y_i	Y_i: $\frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
2"	10	10.665	72	110/132	90/100	108	12:45	2"	.996	10(29.45) 568 / 10.665(29.45+2/13.6) 532
2"	10	10.702	72	116/140	93/100	112	12:57	2"	.994	10(29.45) 572 / 10.702(29.45+2/13.6) 532
2"	10	10.759	72	120/140	94/100	114	12:55	2"	.994	10(29.45) 574 / 10.759(29.45+2/13.6) 532
									Y = .995	

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d.

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y $\pm$0.05Y

P_b = Barometric pressure, in. Hg.

Θ = Time of calibration run, min.

PITOT TUBE INSPECTION DATA SHEET

Pitot Tube Identification Number: #8 Date: 2/22/90

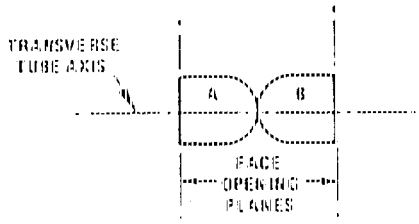
1. What is the external diameter of the tubing in inches? 3/8"

2. Are the face opening planes perpendicular to the transverse axis as in Figure A (end view)? yes

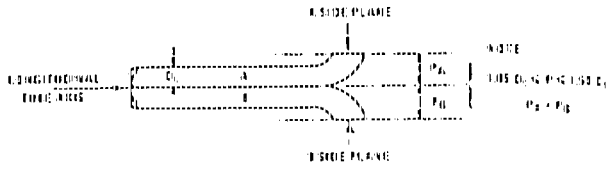
3. Are the face opening planes parallel to the longitudinal axis as in Figure B (top view)? yes

4. Are both legs of equal length and center lines coincident, when viewed from both sides as in Figure (C)? yes

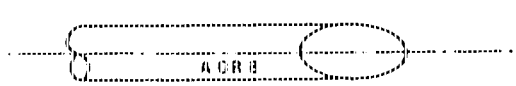
5. Does the tube meet all the geometric specifications to be assigned a .84 coefficient? yes



(a)



(b)



(c)

CALIBRATED BY: Kevin Kennedy

NOZZLE CALIBRATION DATA FORM

Date 9/19/90 Calibrated by R.L.C.

Nozzle identification number	D_1, (in.)	D_2, (in.)	D_3, (in.)	ΔD, (in.)	D_{avg}
#4	.360	.360	.360	0.0	.360

where:

$D_{1,2,3}$, = Three different nozzles diameters, in.; each diameter measure within 0.001 in.

ΔD = Maximum difference between any two diameters, in., $\Delta D \leq 0.004$ in.

D_{avg} = Average of D_1, D_2, and D_3.

C. Field Data Sheets

LOCATION: Dar [illegible]
OPERATOR: R. Kennedy
DATE: 9/20/90
RUN NO.: 80-1
SAMPLE BOX NO.: 4
METER BOX NO.: 443
METER ΔH@:
K FACTOR: 12.1
PITOT TUBE COEFFICIENT, C_p: .84

SCHEMATIC OF STACK CROSS SECTION
Location
Stack diam.:

BAROMETRIC PRESSURE:
ROOM:
NOZZLE:
ASSUMED MOISTURE, %: 18 %
PROBE LENGTH, ft: 6 FT.
NOZZLE IDENTIFICATION NO.: H4
AVERAGE CALIBRATED NOZZLE DIAMETER, (in.): .36
PROBE HEATER SETTING: 250°F
LEAK RATE, (cfm): 0.0 AT 15 in
PROBE LINER MATERIAL: GLASS
STATIC PRESSURE, (in. Hg): +.34
FILTER NO.: 100062

TRAVERSE POINT NUMBER	TIME	SAMPLING TIME (θ), min.	VACUUM (in. Hg)	STACK TEMPERATURE (T_s) (°F)	VELOCITY HEAD (ΔP_s), (in. H_2O)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (in. H_2O)	GAS SAMPLE VOLUME (ft^3)	GAS SAMPLE TEMPERATURE - AT DRY GAS METER INLET (°F)	GAS SAMPLE TEMPERATURE - AT DRY GAS METER OUTLET (°F)	FILTER HOLDER TEMPERATURE, (°F)	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER, (°F)
	8:50	0					578.451				
A-1		3	2.0	143	.20	2.5	581.420	69	68	253	68
2	9:56	6	2.0	143	.25	3.1	584.901	73	66	258	
3	9:20	9	2.0	143	.25	3.1	588.310	79	69	249	
4		12	2.0	143	.25	3.1	591.850	82	69	247	
5	9:26	15	3.0	145	.58	7.1	596.365	83	70	250	
6	9:50	18	10.0	114	.58	7.1	600.780	85	70	253	
7		21	10.0	124	.58	7.1	605.420	96	70	252	
8		24	10.0	128	.58	7.1	610.110	96	71	253	
9		27	10.0	132	.35	4.3	613.009	116	74	251	
10		30	10.0	132	.35	4.3	616.255	117	76	250	
11		33	7.0	143	.22	2.7	619.010	124	78	255	
12	10:10	36	5.0	143	.20	2.4	621.650	124	78	255	
B-1	10:30	39	4.0	126	.28	3.5	624.621	99	81	244	
2		42	4.0	126	.28	3.5	627.555	99	82	245	
3		45	4.0	139	.29	3.5	630.277	114	82	249	
4		48	6.0	141	.37	4.6	634.661	121	82	247	
5		51	7.0	146	.40	5.0	638.600	128	83	248	
6		54	10.0	148	.55	6.8	642.999	132	85	250	
TOTAL								Avg.	Avg.		
AVERAGE								Avg.			

IMPINGER WATER
Final 410 ml
Init. 200 ml
Cond. 210 ml

DESICCANT
Final 241.2 gms
Init. 223.8 gms
Gain 17.4 gms

ORSAT ANALYSES

Time			
CO_2	3.5	3.5	3.5
O_2	17.5	17.5	17.5
CO			

C-083

LOCATION Kaneb Scrubber
OPERATOR Beck W. Lowell
DATE 9/20/90
RUN NO. BO-1
SAMPLE BOX NO. —
METER BOX NO. 443
METER ΔHq
K FACTOR 12.1
PITOT TUBE COEFFICIENT, C_p .84

SCHEMATIC OF STACK CROSS-SECTION
Location
Stack dimen.

BAROMETRIC PRESSURE 28.7
ASSUMED MOISTURE, % 14%
PROBE LENGTH, (ft) 6'
NOZZLE IDENTIFICATION NO. #4
AVERAGE CALIBRATED NOZZLE DIAMETER, (in.) .36
PROBE HEATER SETTING 250°F
LEAK RATE, (cfm)
PROBE LINER MATERIAL GLASS
STATIC PRESSURE, (in. Hg)
FILTER NO. 100062

TRAVERSE POINT NUMBER	TIME	SAMPLING TIME (θ), min.	VACUUM (in. Hg)	STACK TEMPERATURE (T_s) (°F)	VELOCITY HEAD (ΔP_s), (in. H_2O)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (in. H_2O)	GAS SAMPLE VOLUME (ft³)	GAS SAMPLE TEMPERATURE - AT DRY GAS METER INLET (°F)	OUTLET (°F)	FILTER HOLDER TEMPERATURE, (°F)	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER, (°F)
		57					642.998				
B-7		57	10.0	160	.45	5.5	647.110	136	87	251	68
8		60	8.0	151	.38	4.8	650.800	138	90	254	
9		63	8.0	150	.38	4.8	654.441	140	91	252	
10		66	8.0	150	.38	4.8	657.987	141	90	261	
11		69	6.0	156	.36	4.3	661.376	144	94	272	
12	11:06	72	6.0	156	.35	4.3	664.745	145	94	256	
TOTAL								Avg.	Avg.		
AVERAGE				140	.398	4.5	86.284	Avg. 95			

IMPINGER WATER
Final _____ ml
Init. _____ ml
Cond. _____ ml

DESICCANT
Final _____ gms
Init. _____ gms
Gain _____ gms

ORSAT ANALYSES

Time			
CO_2			
O_2			
CO			

LOCATION Baghouse outlet
OPERATOR K. Kennedy
DATE 9/20/90
RUN NO. BO-2
SAMPLE BOX NO. —
METER BOX NO. 443
METER ΔH@ _____
C FACTOR _____
PITOT TUBE COEFFICIENT, C_p .84

SCHEMATIC OF STACK CROSS-SECTION
Location _____
Stack dimen. _____

BAROMETRIC PRESSURE 24.75
ASSUMED MOISTURE, % 18%
PROBE LENGTH, (ft) 6'
NOZZLE IDENTIFICATION NO. #4
AVERAGE CALIBRATED NOZZLE DIAMETER, (in.) .36
PROBE HEATER SETTING 250 °F
LEAK RATE, (cfm) _____
PROBE LINER MATERIAL CLASS
STATIC PRESSURE, (in. Hg) +.34
FILTER NO. 100045

TRAVERSE POINT NUMBER	TIME	SAMPLING TIME (θ), min.	VACUUM (in. Hg)	STACK TEMPERATURE (T_s) (°F)	VELOCITY HEAD (ΔP_s), (in.)H_2O	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (in. H_2O)	GAS SAMPLE VOLUME (ft^3)	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET (°F)	GAS SAMPLE TEMPERATURE AT DRY GAS METER OUTLET (°F)	FILTER HOLDER TEMPERATURE, (°F)	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER, (°F)
	12:20	0					667.600				
A-1		3	5.0	130	.30	3.7	670.145	130	92	255	68
2	12:26	6	5.0	133	.30	3.7	673.577	138	93	253	
3	12:40	9	6.0	135	.35	4.3	677.500	121	93	255	
4		12	6.0	135	.35	4.3	680.870	122	93	249	
5		15	6.5	138	.37	4.5	684.900	122	94	251	
6		18	10.0	143	.50	6.2	688.880	138	91	251	
7		21	12.0	147	.55	6.8	693.370	142	92	250	
8		24	10.0	147	.45	5.5	697.700	146	94	255	
9		27	8.0	150	.33	4.0	701.050	142	95	250	
10		30	8.0	150	.33	4.0	704.450	143	96	250	
11		33	8.0	151	.33	4.0	707.881	144	96	252	
12	1:10	36	8.0	151	.30	3.7	711.070	144	96	250	
B-1	1:12	39	8.0	158	.30	3.7	714.770	131	96	255	
2	9	42	8.0	158	.30	3.7	718.250	141	96	253	
3		45	8.0	159	.37	4.5	722.000	141	96	255	
4	1:21	48	8.0	159	.37	4.5	725.900	142	96	256	
5	147	51	9.0	157	.40	5.0	729.830	149	100	257	
6		54	9.0	157	.40	5.0	733.770	149	100	255	
TOTAL								Avg.	Avg.		
AVERAGE								Avg.			

IMPINGER WATER
Final 356 ml
Init. 200 ml
Cond. 196 ml

DESICCANT
Final 222.1 gms
Init 208.8 gms
Gain 13.3 gms

ORSAT ANALYSES

Time			
CO_2	3.4	3.4	3.4
O_2	17.0	17.0	17.0
CO			

C-098

LOCATION Baghouse outlet
OPERATOR K. Kennedy
DATE 9/20/90
RUN NO. BO-2
SAMPLE BOX NO. —
METER BOX NO. 443
METER ΔH@
C FACTOR
PITOT TUBE COEFFICIENT, C_p .84

SCHEMATIC OF STACK CROSS-SECTION
Location
Stack dimen.

BAROMETRIC PRESSURE 28.75
ASSUMED MOISTURE, % 18 %
PROBE LENGTH, (ft) 6'
NOZZLE IDENTIFICATION NO. #4
AVERAGE CALIBRATED NOZZLE DIAMETER, (in.) .36
PROBE HEATER SETTING 250°F
LEAK RATE, (cfm) 0.0 AT 15
PROBE LINER MATERIAL GLASS
STATIC PRESSURE, (in. Hg) +.34
FILTER NO. 100045

TRAVERSE POINT NUMBER	TIME 54	SAMPLING TIME (θ), min.	VACUUM (in. Hg)	STACK TEMPERATURE (T_s) (°F)	VELOCITY HEAD (ΔP_s), (in. H_2O)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (in. H_2O)	GAS SAMPLE VOLUME (ft^3)	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET (°F)	GAS SAMPLE TEMPERATURE AT DRY GAS METER OUTLET (°F)	FILTER HOLDER TEMPERATURE, (°F)	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER, (°F)
B-7	57		8.0	136	.45	5.5	737.700	121	87	260	<68
8	60		6.0	140	.35	4.3	741.150	127	88	263	
9	63		6.0	144	.30	3.7	744.377	129	89	266	
10	66		5.0	149	.25	3.1	747.270	130	89	265	
11	69		5.0	149	.25	3.1	749.975	131	90	261	
12	72	2.10	5.0	149	.25	3.1	752.801	131	90	260	
TOTAL								Avg.	Avg.		
AVERAGE				147	.590	4.3	85.201	Avg. 114			

IMPINGER WATER
Final 396 ml
Init. ____ ml
Cond. ____ ml

DESICCANT
Final ____ gms
Init. ____ gms
Gain ____ gms

ORSAT ANALYSES

Time			
CO_2			
O_2			
CO			

LOCATION Bechtel Outlet
OPERATOR R. Kennedy
DATE 9/21/90
RUN NO. BG-3
SAMPLE BOX NO. —
METER BOX NO. 443
METER ΔHq
C FACTOR
PITOT TUBE COEFFICIENT, C_p .84

SCHEMATIC OF STACK CROSS-SECTION
Location
Stack dimen.

BAROMETRIC PRESSURE 29.72
ASSUMED MOISTURE, % 18%
PROBE LENGTH, (ft) 6'
NOZZLE IDENTIFICATION NO. H4
AVERAGE CALIBRATED NOZZLE DIAMETER, (in.) .36
PROBE HEATER SETTING
LEAK RATE, (cfm)
PROBE LINER MATERIAL
STATIC PRESSURE, (in. Hg) 4.39
FILTER NO. 100061

TRAVERSE POINT NUMBER	TIME 9:05	SAMPLING TIME (θ), min. 0	VACUUM (in. Hg)	STACK TEMPERATURE (T_s) (°F)	VELOCITY HEAD (ΔP_s), (in. H_2O)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (in. H_2O)	GAS SAMPLE VOLUME (ft³) 753.161	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET (°F)	OUTLET (°F)	FILTER HOLDER TEMPERATURE, (°F)	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER, (°F)
A-1		3	5.0	141	.25	3.1	756.610	73	61	252	68
2		6	5.0	141	.25	3.1	759.770	82	63	250	
3		9	6.0	142	.30	3.7	763.150	87	64	251	
4		12	6.0	142	.30	3.7	766.660	91	67	255	
5		15	10.0	132	.60	7.4	771.101	93	66	254	
6	9:40	18	9.0	135	.50	6.1	775.250	104	69	251	
7		21	9.0	119	.50	6.1	779.400	98	69	268	
8		24	7.0	137	.39	4.6	782.940	105	71	252	
9		27	7.0	138	.38	4.6	786.550	107	71	254	
10		30	5.0	139	.30	3.7	789.777	107	72	251	
11		33	5.0	137	.30	3.7	793.100	101	73	270	
12	9:10	36	5.0	138	.25	3.0	796.060	102	74	265	
B-1	9:20	39	5.5	124	.21	3.3	799.880	98	74	275	
2		42	5.5	143	.27	3.3	802.870	106	74	269	
3		45	6.0	141	.30	3.7	806.171	109	74	267	
4		48	6.0	143	.30	3.7	809.490	110	74	267	
5		51	7.0	146	.35	4.3	812.100	115	77	266	
6		54	10.0	146	.40	5.0	817.317	120	78	266	
TOTAL								Avg.	Avg.		
AVERAGE								Avg.			

IMPINGER WATER
Final 410 ml
Init. 200 ml
Cond. 210 ml

DESICCANT
Final 229.9 gms
Init. 210.4 gms
Gain 19.5 gms

ORSAT ANALYSES

Time			
CO_2	3.4	3.4	3.4
O_2	17.0	17.0	17.0
CO			

C-099

LOCATION Raphaelo Spring
OPERATOR K. Kennedy
DATE 9/21/90
RUN NO. B-3
SAMPLE BOX NO. —
METER BOX NO. 443
METER ΔH@ _____
C FACTOR _____
PITOT TUBE COEFFICIENT, C_p .84

SCHEMATIC OF STACK CROSS SECTION
Location _____
Stack dimen. _____

BAROMETRIC PRESSURE 29.2
ASSUMED MOISTURE, % 18%
PROBE LENGTH, (ft) 6'
NOZZLE IDENTIFICATION NO. #4
AVERAGE CALIBRATED NOZZLE DIAMETER, (in.) .36
PROBE HEATER SETTING 250°F
LEAK RATE, (cfm) 0.0 at 15 Hg
PROBE LINER MATERIAL Glass
STATIC PRESSURE, (in. Hg) _____
FILTER NO. 100061

TRAVERSE POINT NUMBER	TIME 54	SAMPLING TIME (θ), min.	VACUUM (in. Hg)	STACK TEMPERATURE (T_s) (°F)	VELOCITY HEAD (ΔP_s), (in. H_2O)	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER (in. H_2O)	GAS SAMPLE VOLUME (ft^3)	GAS SAMPLE TEMPERATURE - AT DRY GAS METER INLET (°F)	OUTLET (°F)	FILTER HOLDER TEMPERATURE, (°F)	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER, (°F)
B-7	57		10.0	148	.40	5.0	820.990	122	80	264	<68
8	60		7.0	149	.36	4.4	824.670	120	81	265	
9	63		7.0	149	.36	4.4	828.145	120	81	264	
10	66		7.0	150	.34	4.2	831.550	120	81	264	
11	69		7.0	150	.36	4.4	835.222	121	81	265	
12	72	9:56	7.0	150	.36	4.4	838.867	122	81	265	
TOTAL								Avg.	Avg.		
AVERAGE				141	.587	4.3	85.736	Avg. 89			

IMPINGER WATER
Final 410 ml
Init. _____ ml
Cond. _____ ml

DESICCANT
Final _____ gms
Init. 210.4 gms
Gain _____ gms

ORSAT ANALYSES

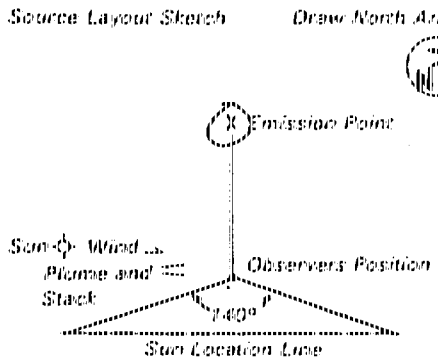
Time			
CO_2			
O_2			
CO			

C-099

Visible Emission Observation Form

SOURCE NAME	Marsh Asphalt Co.
ADDRESS	
CITY	STATE Pa. ZIP
PHONE	SOURCE ID NUMBER
PROCESS EQUIPMENT	Batch Mix — OPERATING MODE Normal
CONTROL EQUIPMENT	Baghouse — OPERATING MODE Normal
DESCRIBE EMISSION POINT	START Stack Exit STOP Stack Exit
HEIGHT ABOVE GROUND LEVEL	START 30' STOP 30'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 110' STOP 110'
DIRECTION FROM OBSERVER	START SW STOP SW
DESCRIBE EMISSIONS	START Very light STOP Very light
EMISSION COLOR	START White STOP White
PLUME TYPE: CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☐ YES ☒	
IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☒	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 1' from exit STOP 1' from exit
DESCRIBE BACKGROUND	START Trees STOP Trees
BACKGROUND COLOR	START Green STOP Green
SKY CONDITIONS	Clear START 40% STOP 40%
WIND SPEED mph	START 0-3 mph STOP 0-3
WIND DIRECTION	START Calm STOP Calm
AMBIENT TEMP.	START 60°F STOP
WET BULB TEMP	
RH percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
9/20/90	8:50	

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1	5	5	5	5	31	5	5	5	5
2	5	5	5	5	32	5	5	5	5
3	5	5	5	5	33	5	5	5	5
4	5	5	5	5	34	5	5	5	5
5	5	5	0	0	35	5	5	5	5
6	0	0	5	5	36	5	5	5	5
7	0	5	5	0	37	5	5	5	5
8	0	5	5	5	38	5	5	5	5
9	0	5	5	5	39	5	5	5	5
10	0	5	5	5	40	5	5	5	5
11	0	5	5	5	41	5	5	5	5
12	5	5	5	5	42	5	5	5	5
13	0	5	5	5	43	5	5	5	5
14	0	5	5	5	44	5	5	5	5
15	0	5	5	5	45	5	5	5	5
16	0	0	0	0	46	5	5	5	5
17	0	5	5	0	47	5	5	5	5
18	0	5	5	0	48	5	5	5	5
19	0	5	5	0	49	5	5	5	5
20	0	5	5	0	50	5	5	5	5
21	0	5	5	0	51	5	5	5	5
22	0	0	5	0	52	5	5	5	5
23	5	5	5	5	53	5	5	5	5
24	5	5	5	5	54	5	5	5	5
25	5	5	5	5	55	5	5	5	5
26	5	5	5	5	56	5	5	5	5
27	5	5	5	5	57	5	5	5	5
28	5	5	5	5	58	5	5	5	5
29	5	5	5	5	59	5	5	5	5
30	5	5	5	5	60	5	5	5	5

AVERAGE OPACITY FOR HIGHEST PERIOD: 5%

NUMBER OF READINGS ABOVE 5 % WERE 0

RANGE OF OPACITY READINGS: 0% MINIMUM — 5% MAXIMUM

OBSERVER'S NAME (PRINT): Richard L. Campbell

OBSERVER'S SIGNATURE: Richard L. Campbell — DATE

ORGANIZATION: CSC INC.

COMMENTS: TEST NO. 1

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE — TITLE — DATE

CERTIFIED BY: ETA — DATE: 9/16/90

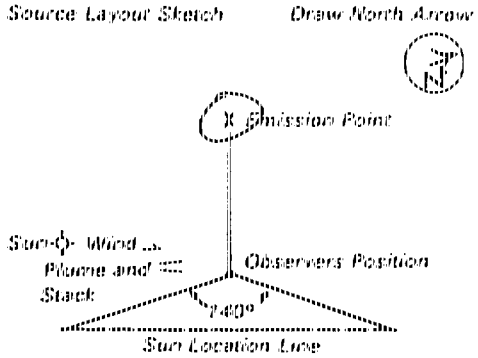
VERIFIED BY — DATE

① @ 8:55 stop plant down
② @ 9:20 start up
③ @ 9:50 start up
④ @ 10:19 stop plant down
⑤ @ 10:33 start up

Visible Emission Observation Form

SOURCE NAME	MARSH Asphalt
ADDRESS	
CITY	
STATE	Pa.
ZIP	
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Rotary Kiln
OPERATING MODE	normal
CONTROL EQUIPMENT	Baghouse
OPERATING MODE	normal
DESCRIBE EMISSION POINT	Baghouse
START	STACK Exit
STOP	Stack Exit
HEIGHT ABOVE GROUND LEVEL	START 30' STOP 30'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 110' STOP 110'
DIRECTION FROM OBSERVER	START SW STOP SW
DESCRIBE EMISSIONS	START Very Light STOP Very Light
EMISSION COLOR	START white STOP white
PLUME TYPE: CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☐ YES ☑	
IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☑	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 1' from Exit STOP 1' from Exit
DESCRIBE BACKGROUND	START Trees STOP Trees
BACKGROUND COLOR	START Green STOP Green
SKY CONDITIONS	clear START 40% STOP 40%
WIND SPEED	START 0-2 STOP 0-2
WIND DIRECTION	START calm STOP calm
AMBIENT TEMP.	START STOP
WET BULB TEMP.	
RH, percent	

Source Layout Sketch



OBSERVATION DATE	START TIME	STOP TIME
9/20/90		11:07

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	5	5	5	5	31				
2	5	5	5	5	32				
3	0	5	0	0	33				
4	0	0	5	5	34				
5	5	5	5	5	35				
6	5	5	5	5	36				
7	5	5	5	5	37				
8	5	5	5	5	38				
9	5	5	5	5	39				
10	5	5	5	5	40				
11	0	5	0	0	41				
12	0	5	0	5	42				
13	5	5	5	5	43				
14	5	5	5	5	44				
15	5	5	5	5	45				
16	5	5	5	5	46				
17	5	5	5	5	47				
18	5	5	5	5	48				
19	5	5	5	5	49				
20	5	5	5	5	50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

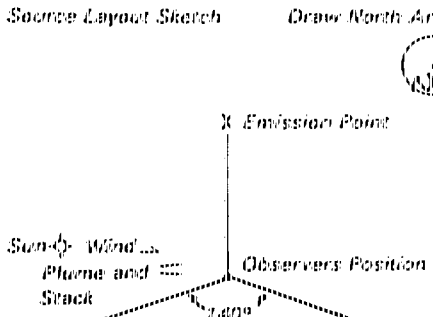
AVERAGE OPACITY FOR HIGHEST PERIOD	NUMBER OF READINGS ABOVE % WERE
RANGE OF OPACITY READINGS	MINIMUM MAXIMUM
OBSERVER'S NAME (PRINT)	Richard L. Campbell
OBSERVER'S SIGNATURE	Richard L. Campbell
DATE	
ORGANIZATION	CSC INC.
CERTIFIED BY	ETA
DATE	9/18/90
VERIFIED BY	
DATE	

COMMENTS	TEST NO. 1 Cont.
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE	
TITLE	
DATE	

Visible Emission Observation Form

SOURCE NAME	MARSH Asphalt Co.
ADDRESS	
CITY	STATE PA. ZIP
PHONE	SOURCE ID NUMBER
PROCESS EQUIPMENT	Rotary Kiln
OPERATING MODE	normal
CONTROL EQUIPMENT	Baghouse
OPERATING MODE	normal
DESCRIBE EMISSION POINT	BAGHOUSE
START	STACK EXIT STOP STACK EXIT
HEIGHT ABOVE GROUND LEVEL	START 30' STOP 30'
HEIGHT RELATIVE TO OBSERVER	START 10' STOP 10'
DISTANCE FROM OBSERVER	START 110' STOP 110'
DIRECTION FROM OBSERVER	START SW STOP SW
DESCRIBE EMISSIONS	START Very light STOP Very light
EMISSION COLOR	START white STOP white
PLUME TYPE: CONTINUOUS ☑	FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT	NO ☐ YES ☑
IF WATER DROPLET PLUME:	ATTACHED ☐ DETACHED ☑
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START 1-foot stack exit STOP 1-foot stack exit
DESCRIBE BACKGROUND	START Trees STOP Trees
BACKGROUND COLOR	START Green STOP Green
SKY CONDITIONS	Overcast START 75% STOP 75%
WIND SPEED PMPH	START 0-3 STOP 0-3
WIND DIRECTION	START SW STOP SW
AMBIENT TEMP.	START 70°F STOP
WET BULB TEMP.	
RH percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
9/20/90	1348	

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	5	0	31	5	5	5	5
2	0	5	5	0	32	5	5	5	5
3	0	5	5	0	33	5	5	5	5
4	5	5	5	5	34	5	0	5	5
5	5	5	5	5	35	5	0	0	0
6	5	5	5	5	36	5	5	5	0
*7	5	5	5	5	37	5	5	5	5
*8	0	0	5	0	38	5	5	0	0
9	0	0	5	0	39	5	5	5	5
10	0	0	0	0	40	5	5	5	5
11	5	5	0	5	41	5	5	0	0
12	5	0	5	5	42	0	0	5	5
13	5	0	5	5	43	5	5	5	0
14	5	5	5	5	44	5	5	5	5
15	5	0	0	0	45	5	5	5	5
16	5	0	5	5	46	5	5	5	5
17	5	5	5	5	47	5	5	5	5
18	5	5	5	5	48	5	5	5	5
19	5	0	5	5	49	5	0	0	5
20	0	0	5	0	50	5	5	5	5
21	5	5	5	0	51	5	5	5	5
22	5	5	5	0	52	0	5	5	0
23	5	5	5	5	53	5	5	5	5
24	0	0	5	0	54	5	5	5	5
25	0	5	0	5	*55	5	0	5	5
26	5	5	0	0	*56	0	0	0	0
27	5	5	5	5	57	0	0	5	0
28	5	5	5	5	58	0	0	0	0
29	5	5	5	5	59	0	0	5	5
30	5	5	5	5	60	0	5	5	5

AVERAGE OPACITY FOR HIGHEST PERIOD 5%

NUMBER OF READINGS ABOVE 10 % WERE 6

RANGE OF OPACITY READINGS 0% MINIMUM 10% MAXIMUM

OBSERVER'S NAME (PRINT) Richard L. Campbell

COMMENTS TEST NO. 2

OBSERVER'S SIGNATURE Richard L. Campbell DATE 9/20/90

ORGANIZATION ESC INC.

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE DATE

CERTIFIED BY EPA DATE 9/18/90

VERIFIED BY DATE

① * 1325 plant down
*1838 plant start up

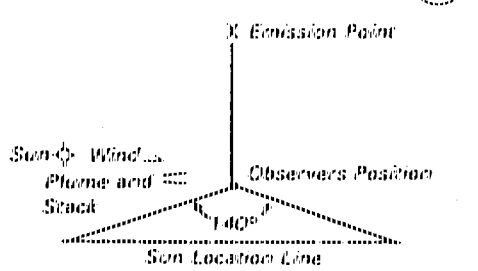
② * 1125 plant shutdown
*1150 plant start up

Visible Emission Observation Form

SOURCE NAME	MARSH Asphalt Co.
ADDRESS	
CITY	
STATE	
ZIP	
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Rotary Kiln
OPERATING MODE	normal
CONTROL EQUIPMENT	Baghouse
OPERATING MODE	normal
DESCRIBE EMISSION POINT	Baghouse
START	STACK EXIT
STOP	STACK Exit
HEIGHT ABOVE GROUND LEVEL START	30'
STOP	30'
HEIGHT RELATIVE TO OBSERVER START	10'
STOP	10'
DISTANCE FROM OBSERVER START	110'
STOP	110'
DIRECTION FROM OBSERVER START	SW
STOP	SW
DESCRIBE EMISSIONS START	Very light
STOP	Very light
EMISSION COLOR START	white
STOP	white
PLUME TYPE: CONTINUOUS ☑ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☐ YES ☑	
IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☑	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	1' from stack exit
STOP	1' from exit
DESCRIBE BACKGROUND START	Trees
STOP	Trees
BACKGROUND COLOR START	Green
STOP	Green
SKY CONDITIONS START	90%
STOP	90%
WIND SPEED START	0-2 MPH
STOP	0-3
WIND DIRECTION START	
STOP	W
AMBIENT TEMP START	70°F
STOP	
WET BULB TEMP	
RH, percent	

Source Layout Sketch

Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
9/20/90		2:11

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	5	5	5	0	31				
2	5	5	5	5	32				
3	5	5	5	5	33				
4	0	5	0	5	34				
5	0	5	0	5	35				
6	0	5	5	0	36				
7	0	0	5	5	37				
8	5	5	5	5	38				
9	5	5	5	5	39				
10	0	5	0	5	40				
11	5	5	5	5	41				
12	0	0	5	0	42				
13	0	0	5	5	43				
14	0	5	5	0	44				
15	5	5	5	5	45				
16	5	5	5	5	46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD

NUMBER OF READINGS ABOVE % WERE

RANGE OF OPACITY READINGS MINIMUM MAXIMUM

OBSERVER'S NAME (PRINT): Richard L. Campbell

OBSERVER'S SIGNATURE: Richard L. Campbell

DATE

ORGANIZATION: CSC INC.

COMMENTS: TEST NO. 2 cont

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE

DATE

CERTIFIED BY: FTA

DATE: 9/20/90

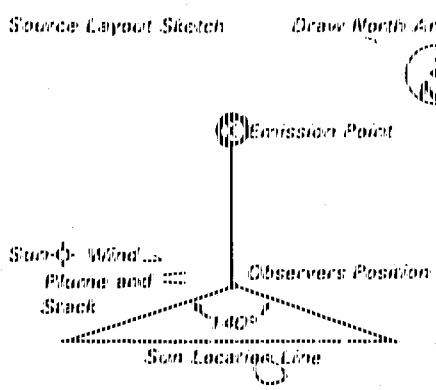
VERIFIED BY

DATE

Visible Emission Observation Form

SOURCE NAME	MARSH Asphalt Co.
ADDRESS	
CITY	
STATE	PA.
ZIP	
PHONE	
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Rotary Kiln
OPERATING MODE	normal
CONTROL EQUIPMENT	Baghouse
OPERATING MODE	normal
DESCRIBE EMISSION POINT	Baghouse
START	stack exit
STOP	stack exit
HEIGHT ABOVE GROUND LEVEL START	30'
STOP	30'
HEIGHT RELATIVE TO OBSERVER START	10'
STOP	10'
DISTANCE FROM OBSERVER START	110'
STOP	110'
DIRECTION FROM OBSERVER START	SW
STOP	SW
DESCRIBE EMISSIONS START	Very light
STOP	Very light
EMISSION COLOR START	white
STOP	white
PLUME TYPE: CONTINUOUS ☑ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☐ YES ☑	
IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☑	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	1' from exit
STOP	1' from exit
DESCRIBE BACKGROUND START	TREES
STOP	TREES
BACKGROUND COLOR START	Green
STOP	Green
SKY CONDITIONS START	50%
STOP	50%
WIND SPEED mph START	0-5
STOP	0-5
WIND DIRECTION START	S.E.
STOP	
AMBIENT TEMP. START	65
STOP	
WET BULB TEMP.	
RH, percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
9/6/90	805 AM	

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	5	5	0	31	5	5	5	5
2	5	5	5	5	32	0	5	0	5
3	0	5	0	5	33	5	5	5	5
4	0	5	5	5	34	5	0	5	5
5	5	0	5	0	35	5	5	0	5
6	5	0	0	5	36	5	5	5	5
7	0	5	5	0	37	5	5	0	5
8	5	5	5	5	38	5	5	0	5
9	5	0	5	0	39	5	5	5	5
10	5	0	5	0	40	5	5	5	5
11	0	5	5	0	41	5	5	0	5
12	5	5	5	5	42	0	0	0	5
13	0	5	5	0	43	5	5	0	5
14	5	5	5	5	44	5	5	5	5
15	5	5	5	0	45	5	0	0	5
16	0	5	5	5	46	5	0	5	5
17	0	0	5	5	47	5	5	5	0
18	0	5	0	5	48	5	0	5	5
19	0	5	5	0	49	5	0	0	0
20	0	5	5	0	50	5	0	5	0
21	5	5	5	0	51	5	0	5	0
22	5	0	0	0	52	5	5	5	5
23	5	5	5	5	53	5	5	0	5
24	5	5	0	5	54	5	0	0	0
25	5	5	5	5	55	5	5	5	0
26	5	5	5	5	56	0	5	0	5
27	5	5	0	5	57	5	5	5	5
28	5	5	5	0	58	0	0	5	5
29	0	0	5	0	59	0	5	5	5
30	0	5	5	5	60	5	0	5	0

AVERAGE OPACITY FOR HIGHEST PERIOD: 4%

NUMBER OF READINGS ABOVE 10 % WERE: 0

RANGE OF OPACITY READINGS: 0% MINIMUM — 10% MAXIMUM

OBSERVER'S NAME (PRINT): Richard L. Campbell

COMMENTS: TEST NO 3

OBSERVER'S SIGNATURE: Richard L. Campbell

DATE: 9/21/90

ORGANIZATION: CSC INC.

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SIGNATURE

TITLE

DATE

CERTIFIED BY: EPA

DATE: 9/18/90

VERIFIED BY

DATE

* plant down at 8:09 am
* plant up at 8:18 am

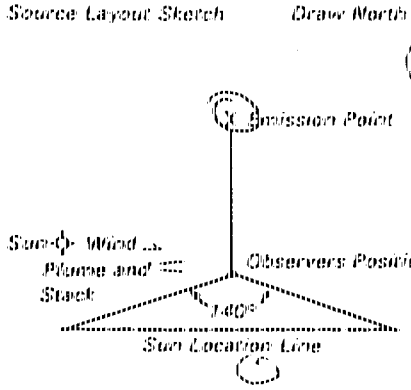
4: 8:24 plant down
4: 8:32 plant up
4: plant down at 8:38

4: 8:56 down
4: 9:00 up
4: 9:10 down
4: 9:15 up

Visible Emission Observation Form

SOURCE NAME	Marsh Asphalt Co.
ADDRESS	
CITY	STATE / ZIP
PHONE	SOURCE ID NUMBER
PROCESS EQUIPMENT	Rotary Kiln
OPERATING MODE	Normal
CONTROL EQUIPMENT	Baghouse
OPERATING MODE	Normal
DESCRIBE EMISSION POINT	Baghouse
START	Stack Exit
STOP	Stack Exit
HEIGHT ABOVE GROUND LEVEL START	30'
STOP	30'
HEIGHT RELATIVE TO OBSERVER START	10'
STOP	10'
DISTANCE FROM OBSERVER START	110'
STOP	110'
DIRECTION FROM OBSERVER START	SW
STOP	SW
DESCRIBE EMISSIONS START	Very light
STOP	Very light
EMISSION COLOR START	white
STOP	white
PLUME TYPE: CONTINUOUS ☑ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☐ YES ☑	IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☑
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	1-from exit
STOP	1-from exit
DESCRIBE BACKGROUND START	Trees
STOP	Trees
BACKGROUND COLOR START	Green
STOP	Green
SKY CONDITIONS START	Overcast 50%
STOP	50%
WIND SPEED START	0-5
STOP	0-5
WIND DIRECTION START	
STOP	
AMBIENT TEMP. START	65°F
STOP	
WET BULB TEMP.	
RH percent	

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE	START TIME	STOP TIME
9/8/90		9:52

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1	0	0	5	0	31				
2	0	5	5	0	32				
3	0	0	0	0	33				
4	0	0	0	5	34				
5	5	5	0	0	35				
6	5	5	5	0	36				
7	5	0	5	0	37				
8	5	5	5	0	38				
9	0	0	0	5	39				
10	5	0	5	5	40				
11	5	5	5	5	41				
12	5	0	5	0	42				
13	5	5	5	0	43				
14	5	5	0	5	44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD	NUMBER OF READINGS ABOVE % WERE
RANGE OF OPACITY READINGS MINIMUM	MAXIMUM
OBSERVER'S NAME (PRINT)	Richard L. Campbell
OBSERVER'S SIGNATURE	Richard L. Campbell — DATE 9/8/90
ORGANIZATION	CSC INC.
COMMENTS	TEST 103 cont.
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE	CERTIFIED BY ETA — DATE 9/8/90
TITLE — DATE	VERIFIED BY — DATE

D. Process Data

MARSH ASPHALT, INC.

PHONE 020-2100

COOLSPRING ☐ BELLEVERNON ☐ CARRICHAELS ☐ CONNELLSVILLE ☐ DRAVOSBURG ☐

DATE.....

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TICKET #	[illegible]	[illegible]	[illegible]	[illegible]				
2545	[illegible]	[illegible]	[illegible]	2.3				
2546	[illegible]	[illegible]	[illegible]	2.3				
2547	[illegible]	[illegible]	[illegible]	2.3				
2548	[illegible]	[illegible]	[illegible]	2.3				
2549	[illegible]	[illegible]	[illegible]	2.3		TEST # 1		
2550	[illegible]	[illegible]	[illegible]	2.3				
2551	[illegible]	[illegible]	[illegible]	2.3				
2552	[illegible]	[illegible]	[illegible]					
2553	[illegible]	[illegible]	[illegible]					
2554	[illegible]	[illegible]	[illegible]					
2555	[illegible]	[illegible]	[illegible]	2.3				
			[illegible]	2.53			2.78 [illegible]	
			= [illegible]					
2583	[illegible]	[illegible]	[illegible]	2.3				
2584	[illegible]	[illegible]	[illegible]	2.3				
2585	[illegible]	[illegible]	[illegible]	2.3				
2586	[illegible]	[illegible]	[illegible]	2.3				
2587	[illegible]	[illegible]	[illegible]	2.3		TEST # 2		
2588	[illegible]	[illegible]	[illegible]	2.3				
2589	[illegible]	[illegible]	[illegible]	2.3				
2590	[illegible]	[illegible]	[illegible]	2.3				
2591	[illegible]	[illegible]	[illegible]	2.3				
2592	[illegible]	[illegible]	[illegible]	2.3				
2593	[illegible]	[illegible]	[illegible]	2.3				
2594	[illegible]	[illegible]	[illegible]					
2595	[illegible]	[illegible]	[illegible]	2.3				
2596	[illegible]	[illegible]	[illegible]	2.3				
			[illegible]	2.59			2.77 [illegible]	
			= [illegible]					
2625	[illegible]	[illegible]	[illegible]	2.3				
2626	[illegible]	[illegible]	[illegible]	2.3				
2630	[illegible]	[illegible]	[illegible]	2.3				
2631	[illegible]	[illegible]	[illegible]	2.3				
2632	[illegible]	[illegible]	[illegible]	2.3				
2633	[illegible]	[illegible]	[illegible]	2.3				
2634	[illegible]	[illegible]	[illegible]	2.3				
2635	[illegible]	[illegible]	[illegible]	2.3		TEST # 3		
2636	[illegible]	[illegible]	[illegible]					
2637	[illegible]	[illegible]	[illegible]	2.3				
2638	[illegible]	[illegible]	[illegible]	2.3				
2639	[illegible]	[illegible]	[illegible]	2.3				
2640	[illegible]	[illegible]	[illegible]	2.3				
2641	[illegible]	[illegible]	[illegible]	2.3				
2642	[illegible]	[illegible]	[illegible]	2.3				
2643	[illegible]	[illegible]	[illegible]	2.3				
			[illegible]	[illegible]			2.78 [illegible]	
			= [illegible]					
						AVG =	2.78 [illegible]	

Test No. 1

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
LOEN EAGLE CONST. CO.
E 045
UNIONTOWN, PA
15401

Job
GROUP 12-90-S14
WASHINGTON CO.
S.R. 0519
ITEM# 0430 0501

Cust# 1507
Job# 1507-11
Truck# DL-62
Mix# 400
Name 102-TOP 90-15
Trucker 0055
Ticket# 2565

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
8:46:00	0	4980	8570	8570	1	570	570	9140
8:46:45	0	4904	8572	8572	-2	571	571	9143
8:47:47	-6	4956	8544	8544	1	571	571	9115
8:48:40	-6	4962	8564	8564	-6	570	570	9134
8:49:40	-4	4962	8600	8600	1	569	569	9169
			Agg Total	42850		Asp Total	2851	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Job/Del Location	LOAD TOTAL
36	596.49	8:50:38 am Sep 26, 1990 F	CSP-2	45701

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
LOUD EAGLE CONST. CO.
R 945
UNIONTOWN, PA
15401

Job
GROUP 12-90-814
WASHINGTON CO.
S.R. 0519
ITEM# 0420 (Cal)

Cust# 1507
Job# 1507-11
Truck# BL-54
Mix# 400
Name 102-TOP 90-15
Trucker HARMOL
Ticket# 2566

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP 2	Asp Total	Batch Total
Target		4968	8630			570		9200
8:58:21	0	4962	8576	8576	-1	575	575	9151
:59:03	2	4886	8616	8616	4	570	570	9186
9:00:03	0	4936	8560	8560	-3	569	569	9129
9:01:05	-2	4936	8582	8582	0	574	574	9156
:02:06	-6	4902	8562	8562	-3	569	569	9131
			Agg Total	42896		Asp Total	2857	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
37	619.37	9:02:56 am Sep 20, 1990	F	CSP-2	45753

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
[illegible] LAND EAGLE CONST. CO.	GROUP 12-90-S14	Cust# 1507
[illegible]	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-73
[illegible]	ITEM# 0420 0500	Mix# 400
		Name ID2-TOP 90-15
		Trucker S. STHH
		Ticket# 2567

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
9:27:40	16	4986	8566	8566	-2	569	569	9135
9:28:16	10	5000	8578	8578	0	572	572	9150
9:29:17	12	4886	8566	8566	-2	567	567	9133
9:30:19	14	4980	8596	8596	-6	574	574	9170
9:31:19	6	4974	8574	8574	-2	571	571	9145
			Agg Total	42880		Asp Total	2853	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del Location	LOAD TOTAL
38	642.24	9:27:09 am Sep 20, 1990	F CSP-2	45733

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job		
LEON EAGLE CONST. CO.	GROUP 12-90-S14	Cust#	1507
1 905	WASHINGTON CO.	Job#	1507-11
UNIONTOWN, PA	S.R. 0519	Truck#	DL-60
15401	ITEM# 0420 0501	Mix#	400
		Name	IBQ-TOP 90-15
		Trucker	PETE C.
		Ticket#	2568

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4960	8630			570		9200
9:58:55	10	4920	8596	8596	-1	572	572	9160
9:59:32	12	4910	8620	8620	4	573	573	9193
10:00:33	14	4920	8576	8576	-1	570	570	9146
10:01:35	10	4922	8558	8558	2	570	570	9128
10:03:07	12	4892	8564	8564	-3	568	568	9133
			Agg Total	42914		Asp Total	2853	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
29	665.12	10:03:57 am Sep 20, 1990	F	CSP-2	45767

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1935

LABORATORY TECHNICIAN: TEMPERATURE: 300°F

Customer	Job	
[illegible] DEN HAGLE CONST. CO.	GROUP 12-90-SI4	Cust# 1507
[illegible]	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-60
[illegible]	ITEM# 0420 050)	Bin# 400
		Base ID2-TOP 90-15
		Trucker J. WALTERS
		Ticket# 2569

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
10:04:08	4	4948	8614	8614	1	572	572	9186
10:05:09	-4	4942	8540	8540	1	569	569	9117
10:06:10	0	5040	8590	8590	3	571	571	9160
10:08:13	-4	4970	8690	8690	-4	572	572	9262
10:07:12	0	4876	8614	8614	-1	574	574	9188
			Agg Total	43064		Asp Total	2858	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Feb/Del	Location	LOAD TOTAL
30	689.00	10:10:03 am Sep 20, 1990	F	CSP-2	45922

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

REPORTING TECHNICIAN:

TEMPERATURE:

Customer	Job		
LOCH EAGLE CONST. CO.	GROUP 12-90-S14	Cust#	1507
N 905	WASHINGTON CO.	Job#	1507-11
UNIONTOWN, PA	S.R. 0519	Truck#	BL-82
15401	ITEM# 0420-0501	Mix#	400
		Name	ID2-TOP 90-15
		Trucker	THIELER
		Ticket#	2570

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570	0	9200
10:05	0	4890	8538	8538	0	571	571	9109
10:40	-6	4970	8552	8552	1	574	574	9126
11:42	-6	4960	8582	8582	3	576	576	9158
12:42	-8	4956	8590	8590	5	564	564	9154
13:44	-4	4884	8596	8596	-3	570	570	9166
		Agg Total		63858		Asp Total	2855	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
31	710.94	10:14:34 am Sep 20, 1990	F	CSP-2	45713

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Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
LEEB EAGLE CONST. CO.
[illegible] 965
UNIONTOWN, PA
15401

Job
GROUP 12-90-S14
WASHINGTON CO.
S.R. 0519
ITEM# 0470_0501

Cust# 1507
Job# 1507-11
Truck# BL-87
Mix# 400
Name 102-TOP 90-15
Trucker FORSYTHE
Ticket# 2571

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP 2	Asp Total	Batch Total
Target		4968	8630			570		9200
10:14:45	-12	4984	8568	8568	-1	571	571	9139
10:15:47	-4	4970	8616	8616	2	573	573	9189
10:16:48	2	4972	8606	8606	6	574	574	9180
10:17:50	-8	4980	8582	8582	0	574	574	9156
10:18:52	0	4896	8550	8550	4	572	572	9122
			Agg Total	43922		Asp Total	2864	

Cost/Ton Percent Tax Load Cost Amount Tax Dest Charge Total Cost

Load#	Job Total	Time & Date	Feb/Mil Location	LOAD TOTAL
32	733.87	[illegible] Sep 20, 1990	CSP-2	45786

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WARNING:
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MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
ALDEN EAGLE COOST. CO.	GROUP 12-90-S14	Cust# 1507
R 945	WASHINGTON CO.	Job# 1507-11
HUNTINGTON, PA	S.R. 0519	Truck# PL-93
15401	ITEM# 0120 0501	Mix# 400
		Name 102-TOP 90-15
		Trucker D. WILLIAMS
		Ticket# 2572

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
10:19:54	2	4928	8556	8556	-5	565	565	9123
10:20:57	8	4946	8582	8582	-3	572	572	9154
10:21:59	10	4884	8620	8620	-4	568	568	9188
10:23:01	8	4976	8580	8580	-2	575	575	9155
10:24:03	6	4942	8552	8552	-1	572	572	9124
		Agg Total		42890		Asp Total	2852	

Cost/Ton	Percent Tax	Load Cost	Annual Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
33	756.70	10:24:55 am Sep 20, 1990	F	CSP-2	45742

RECEIVED BY:

Don Walter

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

[illegible] TECHNICIAN:

TEMPERATURE:

Customer	Job	
[illegible] EAGLE CONST. CO.	GROUP 12-90-SJ4	Cust# 1507
[illegible]	WASHINGTON CO.	Job# 1507-11
[illegible]	S.R. 0519	Truck# BL-78
[illegible]	(TEN# 0420 050)	Mix# 400
		Name ID2-TOP 90-15
		Trucker COLE
		Ticket# 2573

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
10:01:15	20	4940	8550	8550	-1	568	568	9118
1 01:51	24	4994	8538	8538	2	570	570	9108
10:02:52	12	4922	8546	8546	0	572	572	9118
10:03:54	2	4914	8634	8634	-4	569	569	9203
1 04:56	4	4958	8564	8564	-6	569	569	9133
			Agg Total	42832		Asp Total	2848	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Cost Charge	Total Cost

Load#	Job Total	Time & Date	Job/Del	Location	LOAD TOTAL
34	779.54	10:45:55 am Sep 20, 1990	F	CSP-2	45680

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Stack

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Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE: 305°F

Customer	Job	Cust# 1507
...LDEN EAGLE CONST. CO.	GROUP 12-90-SI4	Job# 1507-11
BOX 945	WASHINGTON CO.	Truck# BL-84
...ICHTOWN, PA	S.R. 0519	Mix# 400
5401	ITEM# 0420 0501	Name ID2-TOP 90-15
		Trucker DAVISON
		Ticket# 2574

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
0:45:58	10	4886	8606	8606	-4	566	566	9172
0:46:59	14	5000	8578	8578	-1	570	570	9140
10:48:00	10	4972	8622	8622	1	571	571	9193
0:50:13	4	4948	8540	8540	-6	568	568	9108
0:49:03	4	4958	8530	8530	1	569	569	9107
			Agg Total	42884		Asp Total	2844	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

LoadD	Job Total	Time & Date	Fob/Del Location	LOAD TOTAL
35	802.41	10:52:11 am Sep 20, 1990	F CSP-2	45728

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WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

[illegible] INC.
[illegible] BOX 1125
[illegible] PA. 15401
[illegible] 1400
COOLSPRING PLANT #2 (412) 437-1936

[illegible] QUALITY TECHNICIAN: TEMPERATURE:

Customer
[illegible] EDEN EAGLE CONST. CO.
[illegible] 905
[illegible], PA
401

[illegible]

Cust# 1507
Job# 1507-[illegible]
Truck# [illegible]
[illegible] 960
[illegible]
[illegible]
[illegible] 2575

Time	Agg T	AGG 2	AGG 1	[illegible]	[illegible]	[illegible]	Top Total	Batch Total
Target		4968	[illegible]			[illegible]		9200
[illegible]:52:13	10	4978	[illegible]	[illegible]	[illegible]	[illegible]	569	9119
[illegible]:52:57	0	4960	[illegible]	[illegible]	[illegible]	[illegible]	572	9182
[illegible]:54:06	8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9197
[illegible]:55:06	6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9188
[illegible]:56:21	10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9159
		Agg Total		[illegible]		[illegible]	[illegible]	

Cont/Ton Percent Tax [illegible] Cost Tax Dest Charge Total Cost

Load#	Job Total	[illegible]	[illegible]	LOAD TOTAL
36	[illegible]	[illegible]	[illegible]	45844

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[signature]

Test No. 2

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job		
[illegible] EAGLE CONST. CO.	GROUP 12-90-S14	Cust#	1507
[illegible] 945	WASHINGTON CO.	Job#	1507-11
UNIONTOWN, PA	S.R. 0519	Truck#	BL-80
15401	ITEM# 0420 [illegible]	Mix#	400
		Name	102-TOP 90-15
		Trucker	ROGER
		Ticket#	2585

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
12:25:45	8	4966	8658	8658	0	564	564	9222
[illegible]:26:21	6	4944	8598	8598	1	569	569	9167
[illegible]:27:21	4	4956	8646	8646	3	569	569	9215
12:28:21	6	4888	8548	8548	3	569	569	9117
[illegible]:29:21	6	4918	8614	8614	2	572	572	9186
			Agg Total	43064		Asp Total	2843	

43064

= 21.53 tons

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
4b	1054.22	12:30:12 pm Sep 26, 1990	F	CSP-2	45907

22.95 tons

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WARNING:
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Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
[illegible] EAGLE CONST. CO.
[illegible] 905
UNIONTOWN, PA
15401

Job
GROUP [illegible]
WASHINGTON CO.
S.R. 0519
ITEM [illegible]

Cust# 1507
Job# 1507-11
Truck# BL-77
Mix# 400
Name 102-TOP 90-15
Trucker J. RANKIN
Ticket# 2586

Time	Agg T	AGG 2	AGG 1	Agg Total	Agg T	AGG 4	Asp Total	Batch Total
Target		4968	8630			570		8200
12:46:22	18	4896	8600	8600	0	573	573	9173
:06:58	16	4954	8586	8586	0	571	571	9157
:07:59	10	4926	8566	8566	-1	571	571	9137
12:09:00	14	4970	8570	8570	2	572	572	9142
:50:02	12	4980	8576	8576	-5	571	571	9147
		Agg Total		42898		Asp Total	2858	

= 119 s Mas

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Cost Charge	Total Cost

Load#	Job Total	Time & Date	Job/Del Location	LOAD TOTAL
47	1677.10	12:50:57 pm Sep 20, 1990	F CSP-2	45756

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MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
GOLDEN EAGLE CONST. CO.	GROUP 12 90-714	Cust# 1507
[illegible] 945	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-74
15401	ITEM# 0428 0501	Mix# 400
		Name 102-TOP 90-15
		Trucker RUSSELL
		Ticket# 2587

Time	Agg T	AGG 2	AGG 1	Agg Total	Agg T	A.P.A	Agg Total	Batch Total
Target		4968	8630			570		9200
12:51:03	16	4952	8598	8598	1	573	573	9171
1 :52:04	4	4882	8556	8556	1	570	570	9126
1 :53:05	4	5008	8580	8580	5	570	570	9150
12:54:06	-4	4970	8576	8576	-5	571	571	9147
1 :55:07	-2	5014	8634	8634	1	565	565	9199
		Agg Total		42944		Agg Total	2849	

42944

= 21.47 Ans

Cont/Ton	Percent Tax	Load Cost	Amount Tax	Cost Charge	Total Cost

Load#	Job Total	Time & Date	Sub/Del Location	LOAD TOTAL
48	1100.00	[illegible] Sep 20, 1990 F	CSP-2	45793

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[signature]

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
[illegible] EAGLE CONST. CO.	GROUP 12-90-[illegible]	Cust# 1507
[illegible] 945	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-76
15401	ITEM# 0420 0501	Mix# 400
		Name IDZ-TOP 90-15
		Trucker CAPAN
		Ticket# 2588

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP 1	Asp Total	Batch Total
Target		4968	8630			570		9200
12:56:07	4	4976	8638	8638	-2	567	567	9205
1 :57:08	-2	4934	8632	8632	4	570	570	9202
1 :58:08	-4	5008	8550	8550	2	568	560	9110
12:59:08	4	4964	8546	8546	1	571	571	9117
1 :00:08	-2	4956	8562	8562	0	565	565	9127
			Agg Total	42928		Asp Total	2841	

= 21.46 tons

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Cost Charge	Total Cost

John Capan

Load#	Job Total	Time & Date	Fab/Del Location	LOAD TOTAL
49	1122.88	1:00:53 pm Sep 20, 1990 F	CSP-2	45769

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WARNING:
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MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE: 305°F

Customer
G[illegible] EAGLE CONST. CO.
[illegible] 905
UNIONTOWN, PA
15401

Job
GROUP 12-90-[illegible]
WASHINGTON CO.
S.R. 0519
ITEM# 0420 0501

Cust# 1507
Job# 1507-11
Truck# BL-86
Mix# 400
Name ID2-TOP 90-15
Trucker MIKE
Ticket# 2589

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP 1	Asp Total	Batch Total
Target		4968	8630			570		9200
1:01:09	-4	4990	8646	8630	1	573	573	9213
02:19	0	4972	8562	8562	1	566	566	9128
03:34	-2	4924	8544	8544	3	567	567	9111
1:04:39	0	4898	8712	8712	-3	570	570	9282
05:43	-4	4972	8612	8612	-2	569	569	9181
		Agg Total		43070		Asp Total	2845	

43070

$ 21.54 tons

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Deal Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del Location	LOAD TOTAL
50	1145.64	[illegible] pm Sep [illegible]	CSP-2	45915

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[illegible]

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
[illegible]LDED EAGLE CONST. CO.	GROUP 12-90-S14	Cust# 1507
[illegible] 945	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-62
15401	Tech# [illegible]	Mix# 400
		Name 1D2-TOP 90-15
		Trucker [illegible]
		Ticket# 2590

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
8:07:51	-18	4886	8586	8586	-1	570	570	9156
8:08:30	-4	4992	8616	8616	-1	571	571	9187
8:10:40	-4	4916	8678	8678	-4	571	571	9249
8:11:42	-2	4916	8656	8656	2	568	568	9224
8:12:43	-10	4878	8614	8614	0	573	573	9187
			Agg Total	43150		Asp Total	2853	

43190

= 21.5% [illegible]

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del Location	LOAD TOTAL
51	1168.84	1:13:32 pm Sep 20, 1990	F CSP-2	46003

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Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
GOLDEN EAGLE CONST. CO.
[illegible] 945
UNIONTOWN, PA
15401

Job
GROUP 12-90-S11
WASHINGTON CO.
S.R. 0519
ITEM 0420 0501

Cust# 1507
Job# 1507-11
Truck# DL-54
Mix# 400
Name ID2-TOP 90-15
Trucker MARNOL
Ticket# 2591

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
1:16:09	0	4926	8568	8568	-1	569	569	9137
16:46	-4	4922	8594	8594	2	568	568	9162
17:47	0	4960	8590	8590	1	574	574	9164
1:18:47	-6	4898	8594	8594	-3	573	573	9167
1:19:49	0	4946	8598	8598	-4	571	571	9169
			Agg Total	43944		Asp Total	2855	

43944
= 21.47 tons

Cost/Ton Percent Tax Load Cost Amount Tax Best Charge Total Cost

Load#	Job Total	Time & Date	Fob/Del Location	LOAD TOTAL
52	1191.74	1:20:38 pm Sep 20, 1990	F CSP-2	45799

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WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
GOLDEN EAGLE CONST. CO.	GROUP 12-90-S14	Cust# 1507
[illegible] 945	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# DL-73
15401	ITEM# 0420-0501	Mix# 400
		Name ID2-TOP 90-15
		Trucker S. STUR
		Ticket# 2592

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP 1	Asp Total	Batch Total
Target		4968	8630			570		9200
1:20:50	-2	4890	8584	8584	2	569	569	9153
21:50	-4	4922	8564	8564	0	569	569	9133
22:51	-8	4920	8630	8630	2	568	568	9198
1:23:51	-2	4998	8560	8560	-2	575	575	9135
24:52	-4	4900	8630	8630	1	570	570	9200
		Agg Total		42968		Asp Total	2851	

42968

= 21.48 tons

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
53	1214.65	1:25:[illegible] pm Sep 20, 1990	F	CSP-2	45819

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WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
GOLDEN EAGLE CONST. CO.
R 1 905
UNIONTOWN, PA
15401

Job
GROUP 12-90-814
WASHINGTON CO.
S.R. 0519
ITEM# 0420 0501

Cust# 1507
Job# 1507-11
Truck# BL-68
Mix# 400
Name ID2-TOP 90-15
Trucker PETE C.
Ticket# 2593

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
1:26:42	0	4948	8710	8710	-1	571	571	9281
1:27:10	-2	4910	8566	8566	0	573	573	9139
1:28:10	0	5014	8606	8606	-3	572	572	9170
1:29:19	4	4898	8624	8624	0	567	567	9191
1:30:20	4	5020	8560	8560	2	576	576	9136
			Agg Total	43066		Asp Total	2859	

43066

= 21.53

Cost/Ton Percent Tax Load Cost Amount Tax Dest Charge Total Cost

Load#	Job Total	Time & Date	Fob/Del Location	LOAD TOTAL
58	1237.61	1:30:00 pm Sep 20, 1990	F CSP-2	45925

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WARNING:
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Refer to M.S.D.S. for more information.

MARSH ASPHALT [illegible]
P.O. BOX [illegible]
UNIONTOWN, PA [illegible]
(412) 438-[illegible]
COOLSPRING PLANT #2 [illegible]

[illegible] TECHNICIAN		TEMPERATURE
Customer	Job	Cust# 9999
CASH		Job# 9999
		Truck# 040
		Hand 400-2
		Name [illegible]
		Trucker
		Ticket# [illegible]

Time	Agg T	LOG T	AGG T	Agg Total	Asp T	ASP T	Asp Total	Batch [illegible]
Target		2800	5638			372		
[illegible]	[illegible]	3864	5606	5606	-1	373	373	
[illegible]		2920	5694	5694	2	374	374	
		Agg Total		11300		Asp Total	747	

= 5.65 [illegible]

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dust Charge	Total Cost
[illegible]	6.00	141.55	0.49		150.05

Load#	Job Total	Time & Date	Feb/Dul	Location	Load Total
	6.02	1:44:17 pm Sep 30, 1990	F	CSP-2	[illegible]

RECEIVED [illegible]

[illegible]

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE: 295°F

Customer	Job	
LUSH HAGLE CONST. CO.	GROUP 12-90 S14	Cust# 1507
Box 965	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-60
901	ITEM 0430 0501	Mix# 400
		Name ID2-TOP 90-15
		Trucker J. WALTERS
		Ticket# 2595

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
1:57:19	14	4978	8550	8550	-1	574	574	9124
1:57:56	8	4976	8556	8556	-1	569	569	9125
1:58:57	10	4976	8548	8548	3	565	565	9113
2:00:10	8	5068	8620	8620	-2	574	574	9194
2:01:13	8	4986	8630	8630	-2	567	567	9197
		Agg Total		42904		Asp Total	2849	

42904

$21.45 tons

Cont/Ton	Percent Tax	Load Cont	Amount Tax	Dest Charge	Total Cont

Load#	Job Total	Time & Date	Job/Del Location	Load TOTAL
55	1260.41	2:02:15 pm Sep 20, 1990	F CSP-2	45753

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
G BEN EAGLE CONST. CO.	GROUP 12-90-514	Cust# 1507
B 965	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-02
15401	ITEM# 0420 0501	Mix# 400
		Name 1D2-TOP 90-15
		Trucker THIELER
		Ticket# 2596

Time	Agg T	AGG 2	AGG 1	Asp Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
2:02:26	2	4944	8700	8700	-6	571	571	9271
03:30	8	4884	8540	8540	1	573	573	9113
04:51	6	4902	8730	8730	3	569	569	9299
2:06:03	8	4880	8636	8636	-1	577	577	9213
07:14	6	4942	8620	8620	-6	569	569	9189
		Agg Total		43226		Asp Total	2859	

43226

= 21.6 tons

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Feb/Del	Location	LOAD TOTAL
56	1283.53	2:08:15 pm Sep 20, 1990	F	CSP-2	46085

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B Thiele

Test No. 3

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
LOCH EAGLE CONST. CO.
H 965
UNIONTOWN, PA
15401

Job
GROUP 12-90 S14
WASHINGTON CO
S.R. 0519
ITEM 0420 0[illegible]

Cust# 1507
Job# 1507-11
Truck# BL-75
Mix# 900
Name ID2-TOP 90-15
Trucker NICKLOW
Ticket# 2628

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
8:02:05	10	4946	8594	8594	0	567	567	9161
8:02:47	10	4902	8650	8650	1	567	567	9217
8:03:48	8	4886	8690	8690	0	571	571	9261
8:04:49	6	4948	8634	8634	-5	569	569	9203
8:05:50	6	4960	8622	8622	-4	570	570	9192
		Agg Total		[illegible]		Asp Total	2844	

Cont/Ton	Percent Tax	Load Cost	Amount Tax	Best Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
19	437.66	8:06:40 am Sep 11, 1990	F	CSP-2	46034

RECEIVED BY:

J.W. Nicklow

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE: 300°F

Customer
GOLDEN EAGLE CONST. CO.
1 I 945
LAJOUTOWN, PA
15401

Job
GROUP 12-[illegible]
WASHINGTON CO.
S.R. 0519
[illegible]

Cust# 1507
Job# 1507-11
Truck# BL-88
Mix# 400
Name ID2-TOP 90-15
Trucker GIBSON
Ticket# 2629

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP #	Asp Total	Batch Total
Target		4968	8630			570		9200
8:06:51	0	4986	8634	8634	3	567	567	9201
8:07:51	4	4982	8632	8632	3	567	567	9199
8:08:53	6	4996	8688	8688	-2	572	572	9260
8:09:54	6	4972	8604	8604	-2	568	568	9172
8:10:56	8	4958	8656	8656	-3	563	563	9219
			Agg Total	45234		Asp Total	2837	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Deal Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
20	460.69	8:11:46 am Sep 21, 1990	F	CSP-2	46051

RECEIVED BY:

Guy Gibson

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
GOLDEN EAGLE CONST. CO.	GROUP 12 90-514	Cust# 1507
X 945	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-01
15401	ITEM# 0420 0501	Mix# 400
		Name 102-TOP 90-15
		Trucker GRIFFITH
		Ticket# 2630

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
8:23:36	0	4878	8696	8696	0	569	569	9265
8:23:52	0	4956	8596	8596	1	570	570	9166
8:26:54	-10	4948	8668	8668	5	569	569	9237
8:25:54	-2	4972	8608	8608	3	575	575	9183
8:26:54	-6	4984	8540	8540	2	571	571	9111
		Agg Total		4[illegible]		Asp Total	2854	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Cost Charge	Total Cost

Load#	Job Total	Time & Date	Fee/Pal Location	LOAD TOTAL
21	~~482.67~~ 482.67	8:27:43 am Sep 21, 1990	CSP-2	45962

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
GOLDEN EAGLE CONST. CO.	GOOSE 12-90-S14	Cust# 1507
[illegible] 945	[illegible] CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0525	Truck# BL-62
15401	[illegible]	Mix# 400
		Name ID2-TOP 90-15
		Trucker BOSS
		Ticket# 2631

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP 1	Asp Total	Batch Total
Target		4968	8630			570		9200
0:36:11	0	4960	8642	8642	0	567	567	9209
0:36:53	16	4902	8588	8588	2	568	568	9156
0:37:55	14	4952	8606	8606	3	567	567	9173
0:38:56	14	4950	8660	8660	3	569	569	9229
0:40:03	12	4924	8596	8596	4	571	571	9167
			Agg Total	[illegible]		Asp Total	2842	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Job/Del Location	LOAD TOTAL
22	505.63	8:40:57 am Sep 11, 1990	CSP-2	45934

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-4034

LABORATORY TECHNICIAN: TEMPERATURE:

Customer Job Cust# 9999
CASH Job# 9999
Truck# OTH
Mix# 400-2
Name 1D2 TOP
Trucker
Ticket# 2632

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		2640	5159			341		5500
8:46:06	0	2680	5156	5156	0	341	341	5497
8:47:19	2	2704	5220	5220	2	341	341	5561
		Agg Total		10384		Asp Total	682	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost
20.50	6.00	130.03	7.00		137.03

Load#	Job Total	Time & Date	Fob/Del Location	LOAD TOTAL
1	5.53	8:46:09 am Sep 21, 1990	F CSP-2	11066

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
GOLDEN EAGLE CONST. CO.
[illegible] 945
UNIONTOWN, PA
15401

Job
GROUP 12 90-[illegible]
WASHINGTON CO.
S.R. 0519
[illegible]

Cust# 1507
Job# 1507-11
Truck# BL-61
Mix# 400
Name ID2-TOP 90-15
Trucker MCCULLOUGH
Ticket# 2633

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
8:49:13	-0	4928	8568	8568	-1	566	566	9134
49:56	-2	4960	8698	8698	3	569	569	9267
51:45	6	4914	8540	8540	3	567	567	9107
8:52:33	2	4944	8590	8590	0	571	571	9161
54:08	-2	4908	8650	8650	-2	564	564	9214
		Agg Total		4[illegible]		Asp Total	2637	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dept Charge	Total Cost

Load#	Job Total	Time & Date	Job/Del Location	LOAD TOTAL
23	528.58	8:55:01 am Sep 21, 1990 F	CSP-2	45883

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
LOGS EAGLE CONST. CO.
N 945
UNIONTOWN, PA
15401

Job
GROUP 12-90-514
WASHINGTON CO.
S.R. 0519
ITEM# 0420 0500

Cust# 1507
Job# 1507-11
Truck# BL-73
Mix# 600
Mach ID2-TOP 90-15
Trucker S. STUR
Ticket# 2634

Time	Agg T	AGG 2	AGG 3	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4960	8630			570		9200
8:55:59	-14	4984	8570	8570	0	571	571	9141
8:56:35	4	4936	8602	8602	1	564	564	9166
8:57:02	-2	4986	8620	8620	2	575	575	9195
8:58:40	12	5026	8626	8626	2	568	568	9194
8:59:59	4	4952	8628	8628	-2	563	563	9193
		Agg Total		8304		Asp Total	2041	

Cost/Ton Percent Tax Load Cost Percent Tax Test Charge Total Cost

Load#	Job Total	Time & Date	Fob/Del Location	LOAD TOTAL
20	551.52	9:00:54 am Sep 21, 1990	F CSP-2	45887

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE: 310°F

Customer	Job		
LUEN EAGLE COBLE, CO.	GROUP 17-90 214	Cust#	1507
R 965	WASHINGTON CO.	Job#	1507-11
UNIONTOWN, PA	S.T. 0519	Truck#	BL-54
15401	ITEM# 6120 0001	Mix#	400
		Name	1D2-TOP 90-15
		Trucker	MAXHOL
		Ticket#	2635

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
9:05:20	0	4908	8590	8590	0	566	566	9156
:05:59	0	4936	8708	8708	1	568	568	9276
:07:35	10	4934	8622	8622	3	567	567	9189
9:08:41	2	4928	8626	8626	3	567	567	9193
:09:07	6	5022	8552	8552	-4	568	568	9120
		Agg Total		43098		Asp Total	2836	

Cont/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
25	574.49	9:10:46 am Sep 21, 1990	F	CSP-2	45934

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to MSDS for more information.

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
6 DEN EAGLE CONST. CO.	GROUP 12-90-[illegible]	Cust# 1507
R 945	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. [illegible]	Truck# BL-60
15401	[illegible]	Mix# 400
		Name [illegible]-TOP 90-15
		Trucker J. WALTERS
		Ticket# 2637

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
9:20:11	12	4982	8562	8562	1	568	568	9130
21:00	16	4876	8620	8620	1	566	566	9186
22:10	6	4942	8594	8594	4	568	568	9162
9:20:11	6	5022	8580	8580	2	569	569	9149
23:10	4	4952	8668	8668	2	569	569	9237
		Agg Total		43034		Asp Total	2840	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Rest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Dsl	Location	LOAD TOTAL
26	597.42	9:20:06 am Sep 21, 1990	F	CSP-2	45864

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
LOUD EAGLE CONST. CO.	GROUP 11-90-STA	Cust# 1507
B 945	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-79
15403	ITEM# 0420 0501	Mix# 400
		Name ID2-TOP 90-15
		Trucker POWELL
		Ticket# 2638

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp 1	ASP 2	Asp Total	Batch Total
Target		4968	8630			570		9200
9:36:01	4	4982	8604	8604	0	570	570	9174
9:36:30	0	4966	8572	8572	1	567	567	9139
9:37:30	0	4942	8676	8676	-2	567	567	9243
9:38:39	4	4946	8562	8562	-2	568	568	9130
9:39:40	2	4952	8604	8604	-3	566	566	9170
		Agg Total		43018		Asp Total	2838	

Cost/Ton	Percent Tax	Load Cost	Percent Tax	Best Charge	Total Cost

Load#	Job Total	Time & Date	Job/Cel Location	LOAD TOTAL
27	620.35	9:20:27 am Sep 21, 1990 F	CSP-2	45856

RECEIVED BY:
Richard Powell

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
GOLDEN EAGLE CONST. CO.
R 1 965
GREENTOWN, PA
15401

Job
GROUP 12 90-S15
WASHINGTON CO.
S.R. 0519
ITEM# 0420 0501

Cust# 1507
Job# 1507-11
Truck# BL-68
Mix# 400
Name 1D2-TOP 90-15
Trucker PETE C.
Ticket# 2639

Time	Agg T	AGG 2	AGG 1	Agg Total	Amp T	ASP A	Amp Total	Batch Total
Target		4968	8630			570		9200
9:30:40	-4	4970	8674	8674	-5	569	569	9243
9:31:41	-4	4928	8576	8576	0	573	573	9149
9:32:42	-4	4942	8616	8616	4	564	564	9180
9:33:43	-4	4920	8656	8656	4	570	570	9226
9:34:44	4	4950	8598	8598	-6	562	562	9160
			Agg Total	43126		Amp Total	2838	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
28	643.33	9:35:35 am Sep 21, 1990	F	CSP-2	45958

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1935

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
COLLEGE EAGLE CONST. CO.	GROUP 12-90-514	Cust# 1507
R 965	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-87
15401	ITEM 0420 (50)	Mix# 400
		Name 102-TOP 90-15
		Trucker FORSYTHE
		Ticket# 2640

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP 4	Asp Total	Batch Total
Target		4968	8630			570		9200
9:35:45	0	4954	8622	8622	2	568	568	9190
9:36:45	0	4932	8538	8538	1	568	568	9106
9:37:00	0	4942	8560	8560	-2	567	567	9127
9:38:02	0	4936	8692	8692	-3	571	571	9263
9:39:40	0	4936	8642	8642	2	569	569	9211
		Agg Total		43054		Asp Total	2843	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Best Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
29	666.27	9:40:37 am Sep 21, 1990	F	CSP-2	45897

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE: 300°F

Customer	Job	
[illegible] EAGLE CONST. CO.	GROUP 12-90 SI4	Cust# 1507
[illegible] 965	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-82
15401	ITEM# [illegible]	Mix# 400
		Name 1D2-TOP 90-15
		Trucker THIELER
		Ticket# 26441

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
9:40:49	4	4908	8664	8664	3	569	569	9233
9:41:50	0	4962	8570	8570	2	570	570	9140
9:42:50	4	4892	8656	8656	-3	570	570	9236
9:43:51	2	4914	8670	8670	4	568	568	9238
9:44:52	2	4904	8630	8630	-1	568	568	9198
		Agg Total		43190		Asp Total	2845	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Fob/Del	Location	LOAD TOTAL
30	699.29	9:45:41 am Sep 21, 1990	F	CSP-2	46035

RECEIVED BY:

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1[illegible]

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer
LOEN EAGLE CONST. CO.
[illegible] 045
UNIONTOWN, PA
[illegible]

Job
GROUP 12-90-S14
WASHINGTON Co.
S.R. 0519
ITEM 0420 0501

Cust# 1507
Job# 1507-11
Truck# BL-84
Mix# 400
Name HOZ-TOP 90-15
Trucker DAVISON
Ticket# 2642

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4960	8630			570		9200
9:46:02	0	4922	8560	8560	-1	566	566	9126
46:54	4	4886	8582	8582	-4	565	565	9147
47:55	4	5016	8568	8568	-4	567	567	9135
9:48:56	8	4942	8540	8540	4	571	571	9111
49:58	6	4966	8570	8570	-3	566	566	9136
		Agg Total		42820		Asp Total	2835	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dept Charge	Total Cost

Load#	Job Total	Time & Date	Job/Bal	Location	LOAD TOTAL
33	712.12	[illegible]	[illegible]	CSP-2	45655

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Davison

WARNING:
Skin contact may cause thermal burns.
Refer to M.S.D.S. for more information.

MARSH ASPHALT, INC.
P.O. BOX 1125
UNIONTOWN, PA. 15401
(412) 438-1400
COOLSPRING PLANT #2 (412) 437-1936

LABORATORY TECHNICIAN:

TEMPERATURE:

Customer	Job	
[illegible] EAGLE CONST. CO.	GROUP 12-90-S14	Cust# 1507
[illegible] 905	WASHINGTON CO.	Job# 1507-11
UNIONTOWN, PA	S.R. 0519	Truck# BL-78
15401	TTCH# 0420 0500	Mix# 400
		Name 102-TOP 90-15
		Trucker COLE
		Ticket# 2643

Time	Agg T	AGG 2	AGG 1	Agg Total	Asp T	ASP A	Asp Total	Batch Total
Target		4968	8630			570		9200
9:51:50	0	4962	8552	8552	0	572	572	9124
52:26	0	4956	8566	8566	3	568	568	9134
53:27	0	4982	8572	8572	-2	568	568	9140
9:54:28	0	4944	8626	8626	4	563	563	9189
55:28	2	4996	8608	8608	2	570	570	9178
			Agg Total	42924		Asp Total	2841	

Cost/Ton	Percent Tax	Load Cost	Amount Tax	Dest Charge	Total Cost

Load#	Job Total	Time & Date	Job/Del Location	LOAD TOTAL
32	735.00	9:56:32 am Sep 21, 1990	F CSP-2	45765

RECEIVED BY:

ptacle

FABRIC FILTER DATA SHEET — PARAMETERS
OF DESIGN AND OPERATION AFFECTING PERFORMANCE

Facility: Marsh Asphalt (Cockspur) Boiler No.:

Monitor Name: Test No.: 1-3

Design Efficiency: Test Date: 9/26 & 9/27

	Recording Interval: Sampling Time (minutes)	Recording Interval: Clock Time (24 hr. clock)	Pressure Drop Across Baghouse (in. H_2O)	Pressure Drop Across Compartment (in. H_2O): 1	2	3	4	5
TEST NO. 1	9/26	8:15am	5.6"					
		8:30	5.9					
		8:45	4.7					
		9:00	4.2					
		9:15	3.8					
		9:30	3.2					
		9:45	5.0					
		10:00	5.0					
		10:15	4.0					
		10:30	4.8					
TEST NO. 2	9/26	12:30pm	4.9					
		12:30	5.8					
		12:45	4.9					
		1:00	4.0					
		1:15	4.7					
		1:30	4.2					
		2:00	5.7					
		2:30	3.4					
TEST NO. 3	9/27	8:05 Am	3.8"					
		8:10 Am	5.0					
		8:25	4.4					
		8:45	4.6					
		9:00	4.0					
		9:20	5.6					
		9:35	4.2					
		9:50	3.4					
		10:00	3.6					
		Representative						
		Design						

E. Laboratory Data

ANALYTICAL DATA

Test No.	BO-1	BO-2	BO-3
Test Data	9/20/90	9/20/90	9/21/90
Filter No.	100062	100045	100061
Filter Tare, mg	619.6	640.0	621.1
Filter Final, mg	647.4	663.1	643.6
Filter Net, mg	27.8	23.1	22.5
Probe Acetone, mg	36.1	29.1	25.6
Probe Water, mg	6.9	6.2	6.1
Impinger Sol, mg	30.0	2.4	6.5
Impinger Insol., mg	1.3	4.1	6.1
Impinger Acetone, mg	12.4	7.7	9.3
Acetone Blank (mg)*	0.08	---	---
Water Blank (mg)*	0.1	---	---
Total Particulate, mg	84.5	70.2	69.6

*Data not corrected for blank values.

Analyst [signature]

Reviewer [signature]

F. V. E. CERTIFICATION

EASTERN
TECHNICAL
ASSOCIATES

919-834-2970

MEMO TO: Richard L. Campbell
Comprehensive Safety Compliance, Inc.

FROM: THOMAS ROSE
President
Eastern Technical Associates

DATE: OCTOBER 11, 1990

SUBJECT: FIELD CERTIFICATION VERIFICATION

This is to certify that Richard L. Campbell did pass the Field Certification session of the Pittsburgh, Pennsylvania Smoke School that was conducted on September 18, 1990. He will be issued a wallet card and Certification Certificate with the number 4227249 on it.

If you have any questions, please contact our office.

Thank you,

2412 ATLANTIC AVE.
P.O. BOX 58495
RALEIGH, NC 27658