APPENDIX K

COMPANY NAME: Valley Asphalt Corp. Plant # 5

COUNTY: Warren

DATE SENT:

PREMISE/SOURCE NO.: 1483110113 P902

SCC CODE: 3-05-002-01

SOURCE DESCRIPTION: Asphaltic Concrete Batch Plant

CONTROL EQUIPMENT: Fabric Filter Baghouse

MONITORING EQUIPMENT (CEM): N/A

TEST FIRM: Ramcon

DATE (S) OF TEST: Sept. 20,1994

FINAL TEST REPORT RECEIVED ON: 10-18-94

POLLUTANT (S) TESTED: Particulate

AUDIT SAMPLE SUBMITTED (please circle): ~~YES or~~ NO (if yes) PASSED or FAILED

EMISSION RATES*:

ACTUAL**: .022 gr./dscf

ALLOWABLE**: .04 gr./dscf

OPERATING RATES*:

MAXIMUM**: 300 tph

DURING TEST PERIOD**: 260 tph virgin 286 tph w/ Rap

TEST RESULTS: PASSED ~~or FAILED or RETEST~~

WERE ALL THE RUNS WITNESSED BY THE OEPA/LOCAL INSPECTOR (S) ~~YES~~ ~~or~~ NO
IF NO, THEN EXPLAIN UNDER COMMENTS:

COMMENTS: Two runs were observed.
The test data indicates compliance, but due to poor quality assurance, retesting should be conducted to determine an accurate emission rate.

I HEREBY VERIFY THAT THE INFORMATION CONTAINED WITHIN THE STACK TEST REPORT HAS BEEN REVIEWED AND IT HAS BEEN DETERMINED THAT THE TEST PROCEDURES, ANALYSES AND CALCULATIONS ARE:

[x] AN ACCEPTABLE DEMONSTRATION OF CONFORMANCE WITH THE APPROVED TESTING METHODOLOGY.

[ ] AN UNACCEPTABLE DEMONSTRATION OF CONFORMANCE WITH THE APPROVED TESTING METHODOLOGY.

Nov. 22, 1994
DATE OF REVIEW

Trent R. Lewis II
PREPARED BY Trent R. Lewis II

REVIEWED BY LeRoy R. Gruber

* BASED ON THREE RUN AVERAGES
** SPECIFY APPLICABLE UNITS
g:\m&a\lgruber\apndxk.frm

OBSERVER'S REPORT:

COMPLIANCE TEST

for

Particulate

Facility:	Valley Asphalt Corp. # 5
Premise Number:	1483110113
Source:	P902
Conducted On:	Sept. 20, 1994
Test Firm:	Ramcon
Observed By:	Trent R. Lewis II
Prepared By:	Trent R. Lewis II
Date Prepared:	Dec. 1, 1994

HAMILTON COUNTY
DEPARTMENT OF ENVIRONMENTAL SERVICES -
AIR QUALITY MANAGEMENT
1632 CENTRAL PARKWAY, ROOM 201
CINCINNATI, OHIO 45210

OEPA COPY
P&E COPY
M&A COPY

Valley Asphalt
Pn: 1483110113 P902

Testing for particulate emissions was performed at Valley Asphalt Plant #5 in Morrow Ohio on Sept. 20, 1994. The tests were conducted on the Asphalt batch plant. Applicable OAC Rules include: 3745-17-07, 3745-17-11, and the New Source Performance Standards specified in 40 CFR Part 60, Subpart I. The unit is rated at 300 tons/hr.throughput. The allowable particulate emissions rate is .04 gr./dscf. Only two runs were observed due to time constraints. The first run took two attempts to start.

Testing was executed by Ramcon Inc., under the supervision of Mr. Rob Bade to determine if particulate matter emission levels were within compliance with Permit to Operate (PTO) conditions, before the renewal of the PTO. DOES observer Trent Lewis (ET-2) was present during testing. Emission sampling was conducted to fulfill PTO requirements to test before reissue. Two runs of testing were observed by DOES representatives.

Test data is summarized in the tables below:

Particulate	**gr./dscf**	**lbs./ hr.**
Run 1	**.028**	**6.99**
Run 2	**.021**	**4.58**
Run 3	**.018**	**4.09**
Avg.	**.022**	**5.21**

For each respective run, the contractor's calculations were .0325, .0208, and .0179 gr./dscf. The difference between the test contractor's Run 1 calc. and the DOES calc. is mainly based on an incorrect meter volume correction used by the contractor. The DOES calc. should be used for compliance.

Stack conditions during testing averaged:

STACK GAS FLOW:	27,152 dscfm
STACK TEMP:	252 degrees F
% MOIST:	22.8
% O2:	15.3
% CO2:	2.3

The product produced during testing was 301 grade asphalt containing 10% RAP material. Production of asphaltic concrete during testing was at 286 tons/hr; 260 tons/hr. was virgin material and 26 tons/hr. RAP. The use of RAP is not customarily considered worst case conditions. A possible derating to the production value of virgin material or the requirement to run 10% rap may be in order. The observer did inform the facility contact about the use of rap.

There were multiple quality assurance concerns noted during testing. The probe used narrowed at the end where the probe connects to the connection tube leading to the filter holder. This causes a problem when attempting to recover particulate from the probe because the narrowing of the probe end does not allow the probe brush to completely pass through the probe.

This conflicts with federal methodology (40 CFR Part 60 re: Method 5), and may cause "packing" of the particulate material at the end of the probe. The tapering also hampers the visual inspection of the probe to determine if thorough cleaning has been performed. In addition, the sampling train cyclone and moisture collection flask used at the plants were not able to be properly rinsed with acetone and brushed clean due to the design of the unit. Consequently, the test team did not have equipment to thoroughly clean the cyclone.

These concerns led DOES to issue a letter to the contractor attempting to correct these problems in the future.

To use the data as an indicator of compliance, the observer attempted to simulate a worst case particulate loss due to the recovery problems encountered in the field by multipling the particulate catch in the acetone by 150%. The resultant average calculated to be .0315 gr./dscf. This weighted average could arguably be used as the reported emission rate when particulate loss rate, and the use of rap in production are considered.

Calibration of field sampling equipment, on site leak checks of equipment, and use of designated analytical equipment and sampling reagents were included in the quality assurance measures taken. Calculations of flow rate, isokinetic ratio, and mass emission rate were checked.

In conclusion, the proper testing protocol was followed,however DOES concerns as stated above (particulate recovery, actual emission rate, the tapering of the probe.) should be noted. The source was operating at near worst case conditions. The data is of sufficient accuracy and precision to be used in the determination of compliance.

Stack Test Results

Facility: Valley Asphalt #5
Source: P902
TestDate: 9-20-94
Observer: TRL

Variables	(units)	Run #1	Run #2	Run #3
Vm	ft3	41.748	38.722	41.026
Y		1.003	1.003	1.003
Pbar	inHg	29.95	29.95	29.95
delta H	in H2O	0.97	0.83	0.9
Tm	F	8	90	93
Vlc	ml	284	250	242
CO2	%	2	2	3
O2	%	16	14	16
N	%	82	84	81
CO	%	0	0	0
Cp		0.84	0.84	0.84
SQPD		0.4981	0.4429	0.4521
Ts	F	254	251	251
Pstatic	in H2O	29.96	29.96	29.96
ST LNTH.	in	60	60	60
ST. WID	in	60	60	60
Mn	mg	123.7	69.35	66.05
Dn	in	0.3	0.3	0.3
Theta	min	75	75	75

		Run #1	Run #2	Run #3	
Volume Metered	**Vm(std)=**	**47.38263**	**37.38312**	**39.39934**	**dscf**
Vol of H2O vap colt	**Vw(std)=**	**13.36788**	**11.7675**	**11.39094**	**scf**
Moisture content	**Bws=**	**0.220046**	**0.239417**	**0.224274**	
Mol wt dry basis	**Md=**	**28.96**	**28.88**	**29.12**	**lb/lb-mole**
Mol wt wet basis	**Ms=**	**26.5483**	**26.27514**	**26.62607**	**lb/lb-mole**
Avg stack gas vel	**Vs=**	**33.88995**	**30.22676**	**30.65063**	**fps**
Vol flwrt @stk cnd	**Qa=**	**50831.68**	**45337.24**	**45973.01**	**acfm**
Vol flwrt @drystd c	**Qsd=**	**29336**	**25622.85**	**26499.46**	**dscfm**
Vol flw rt @std cnd	**Qs=**	**37612.45**	**33688.44**	**34160.85**	**scfm**
Isokinetic variation	**%I=**	**109.4968**	**98.90794**	**100.7941**	**%**
Particulate conc	**Cs1=**	**0.040204**	**0.028569**	**0.025817**	**gr/dscf**
Part conc	**Cs2=**	0.0000057	0.0000041	0.0000037	**lb/dscf**
Part. emiss. rate	**ER1=**	**10.11**	**6.28**	**5.87**	**lbs/hr**

[redacted]

Stack Test Results

Facility: Valley Asphalt #5
Source: R902
TestDate: 9-20-94
Observer: TRL

Variables	(units)	Run #1	Run #2	Run #3
Vm	ft3	41.748	38.722	41.026
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delta H	in H2O	0.97	0.83	0.9
Tm	F	8	90	93
Vlc	ml	284	250	242
CO2	%	2	2	3
O2	%	16	14	16
N	%	82	84	81
CO	%	0	0	0
Cp		0.84	0.84	0.84
SQPD		0.4981	0.4429	0.4521
Ts	F	254	251	251
Pstatic	in H2O	29.96	29.96	29.96
ST LNTH.	in	60	60	60
ST. WID	in	60	60	60
Mn	mg	85.5	50.6	46
Dn	in	0.3	0.3	0.3
Theta	min	75	75	75

		Run #1	Run #2	Run #3	
Volume Metered	**Vm(std)=**	**47.38263**	**37.38312**	**39.39934**	**dscf**
Vol of H2O vap colt	**Vw(std)=**	**13.36788**	**11.7675**	**11.39094**	**scf**
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Vol flw rt @std cnd	**Qs=**	**37612.45**	**33688.44**	**34160.85**	**scfm**
Isokinetic variation	**%I=**	**109.4968**	**98.90794**	**100.7941**	**%**
Particulate conc	**Cs1=**	**0.027789**	**0.020845**	**0.01798**	**gr/dscf**
Part conc	**Cs2=**	**3.97E-06**	**2.98E-06**	**2.57E-06**	**lb/dscf**
Part. emiss. rate	**ER1=**	**6.99**	**4.58**	**4.09**	**lbs/hr**

Stack Test Results

Facility: Valley Asphalt #5
Source: P902
TestDate: 9-20-94
Observer: TRL

Variables	(units)	Run #1	Run #2	Run #3
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Ts	F	254	251	251
Pstatic	in H2O	29.96	29.96	29.96
ST LNTH.	in	60	60	60
ST. WID	in	60	60	60
Mn	mg	85.5	50.6	46
Dn	in	0.3	0.3	0.3
Theta	min	75	75	75

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Isokinetic variation	%I=	109.4968	98.90794	100.7941	%
Particulate conc	Cs1=	0.027789	0.020845	0.01798	gr/dscf
Part conc	Cs2=	3.97E-06	2.98E-06	2.57E-06	lb/dscf
Part. emiss. rate	ER1=	6.99	4.58	4.09	lbs/hr

RAMCON
ENVIRONMENTAL CORPORATION

RECEIVED
OCT 18 1994

Source Sampling for Particulate Emissions

McCarter Batch-Mix Baghouse
Permit No. 14831110113P902

VALLEY ASPHALT CORPORATION
MORROW, OHIO
September 20, 1994

Fred Brammer
Valley Asphalt Corporation

G. Sumner Buck, III
President
RAMCON Environmental Corporation

RAMCON BUILDING, 6707 FLETCHER CREEK COVE, MEMPHIS, TENNESSEE 38133
TELEPHONE 800/458-4567 IN TENNESSEE 901/387-0500 FAX 901/387-0400

RAMCON
ENVIRONMENTAL CORPORATION

October 6, 1994

Mr. Fred Brammer
Valley Asphalt Corporation
11641 Mosteller Road
Cincinnati, Ohio 45421

RE: Particulate Emissions Test: September 20, 1994

Dear Mr. Brammer:

Enclosed you will find three (3) copies of our report on the particulate emissions test we conducted pursuant to permit no. 1483111011 3P902 at your asphalt plant located in Morrow, Ohio. Based on our test results, the average grain loading of the three test runs do pass the standards set by the State of Ohio. Therefore, the plant is operating in compliance with State standards.

You will want to sign the report covers and send one copy to:

Mr. Frank Story
Southwestern Ohio Air Pollution
Control Agency
1632 Central Parkway
Cincinnati, Ohio 45210

You will need to keep one copy of the report at the plant.

We certainly have enjoyed working with you. Please let us know if we can be of further assistance.

Sincerely,

G. Sumner Buck, III
President

GSBiii:wpc
Enclosures

RAMCON BUILDING, 6707 FLETCHER CREEK COVE, MEMPHIS, TENNESSEE 38133
TELEPHONE 800/458-4567 IN TENNESSEE 901/387-0500 FAX 901/387-0400

TABLE OF CONTENTS

SECTION A:

1. INTRODUCTION
2. TEST RESULTS
3. TEST PROCEDURES

SECTION A.

1. INTRODUCTION

On September 20, 1994 personnel from RAMCON Environmental Corporation conducted a source emissions test pursuant to permit no. 14831110113P902 for particulate emissions compliance at Valley Asphalt Corporation's McCarter batch-mix asphalt plant located in Morrow, Ohio. RAMCON personnel conducting the test were Rob Bade, Team Leader, and Charles Dicks. Tommy South was responsible for the laboratory analysis including taring the beakers and filters and recording final data in the laboratory record books. Custody of the samples was limited to Mr. Bade and Mr. South.

The purpose of the test was to determine if the rate of particulate emissions from this plant's baghouse is below or equal to the allowable emissions limit set by US EPA and the State of Ohio.

Mr. Trent Lewis of Ohio's Southwestern Regional Pollution Control Agency observed the testing conducted by RAMCON Environmental Corporation.

2. TEST RESULTS

The table below summarizes the test results. The grain loading limitation for EPA is .04 gr/dscf as specified in 39 FR 9314, March 8, 1974, 60.92 Standards for Particulate Matter (1), as amended. The allowable emissions for the State of Ohio are the same as those set by EPA.

Summary of Test Results

September 20, 1994

Test Run	Time	Actual Emissions gr/dscf	Emissions lbs/hr	Isokinetic Variation %
1	12:58 - 14:17	0.0325	7.79	98.4
2	15:20 - 16:44	0.0208	4.55	99.6
3	17:30 - 18:42	0.0179	4.04	102.0
Average:		0.0237	5.46	

On the basis of these test results, the average grain loading of the three test runs is below the .04 gr/DSCF allowable emissions limitation set by EPA and the State of Ohio. Therefore, the plant is operating in compliance with State standards.

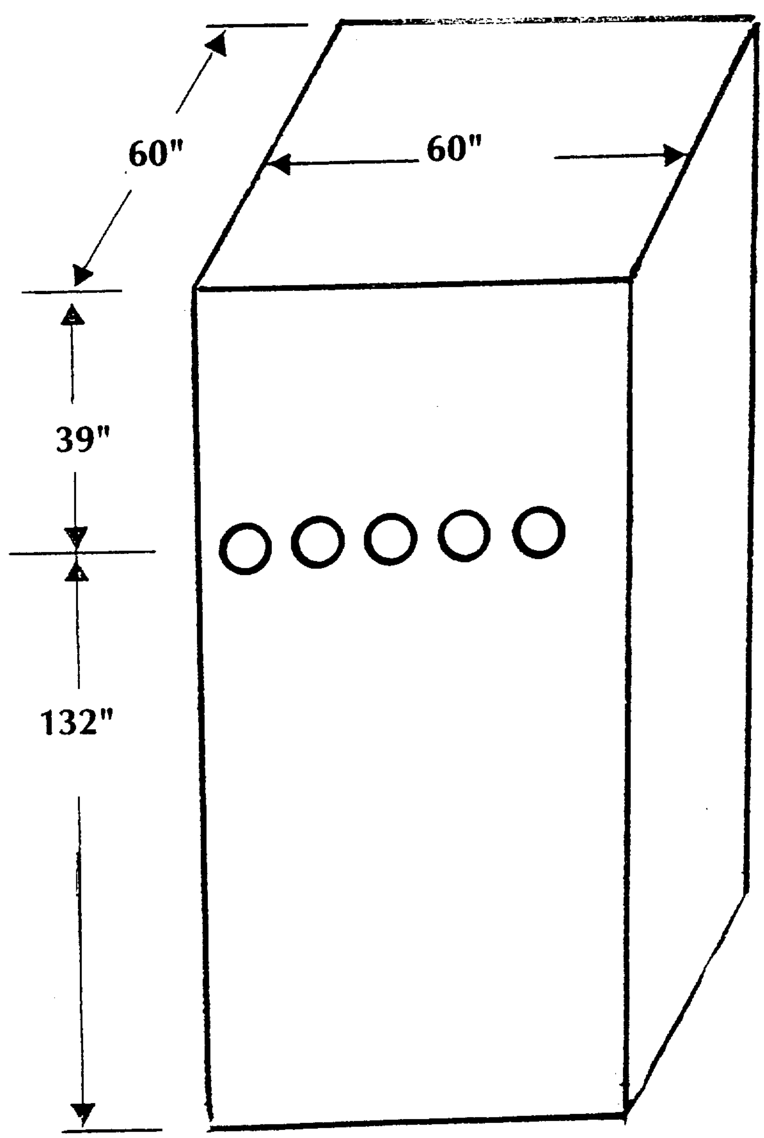
3. TEST PROCEDURES

(a) Method Used: Method 5 source sampling was conducted in accordance with requirements of the U.S. Environmental Protection Agency as set forth in 39 FR 9314, March 8, 1974, 60.93, as amended.

(b) Problems Encountered: Testing was delayed due to failure of the pre-test leak check. After the leak was repaired, testing was not affected.

(c) Sampling Site: The emissions test was conducted after a baghouse on a rectangular stack measuring 60" x 60" with an equivalent diameter of 60". Five (5) sampling ports were placed 39" down (.65 diameters upstream) from the top of the stack and 132" up (2.2 diameters downstream) from the last flow disturbance. The ports were evenly spaced on 12" centers. The two outside ports are 6" from the side walls of the stack. Twenty-five (25) points were sampled, five (5) through each port for three (3) minutes each for a total testing time of seventy-five (75) minutes.

Points on a Diameter	Probe Mark*
1	6.0"
2	18.0"
3	30.0"
4	42.0"
5	54.0"



SECTION B:

THE SOURCE

THE SOURCE

Valley Asphalt Corporation employs a McCarter batch-mix asphalt plant which is used to manufacture hot mix asphalt for road pavement. The process consists of blending prescribed portions of cold feed materials (sand, gravel, screenings, chips, etc.) uniformly and adding sufficient hot asphalt oil to bind the mixture together. After the hot asphalt mix is manufactured at the plant, it is transported to the location where it is to be applied. The hot asphalt mix is spread evenly over the surface with a paver then compacted with a heavy roller to produce the final product.

The following is a general description of the plant's manufacturing process: The cold feed materials (aggregate) are dumped into separate bins which in turn feed a common continuous conveyor. The aggregate is dispensed from the bins in accordance with the desired formulation onto the cold feed system conveyor, to an inclined weigh conveyor, then to a rotating drum for continuous mixing and drying at approximately 300°F. When recycled asphalt mix is used, it is added directly into the pugmill. The dried aggregate is pulled by a bucket elevator to the top of a gradation control unit which separates and stores the aggregate by size. The required amount of each aggregate is dispensed into a weigh-hopper and from there into a pugmill where the hot liquid asphalt pavement is mixed thoroughly with the aggregate. The hot asphalt mix is then discharged from the storage silo through a slide gate into waiting dump trucks which transports the material to a final destination for spreading. The rated capacity of the plant will vary with each aggregate mix and moisture content with a 5% surface moisture removal.

The mixer uses a burner fired with natural gas to heat air to dry the aggregate. The air is drawn into the system via an exhaust fan. After passing through the gas burner, the air passes through a baghouse. The baghouse is manufactured by McCarter. The exhaust gas is drawn through the baghouse and discharged to the atmosphere through the stack. The design pressure drop across the tube sheet is 2 - 6 inches of water. The particulate matter, which is removed by the baghouse, is reinjected into the pugmill.

ran R__ 03

DATA ON FACILITY BEING STACK TESTED

TODAY'S DATE: 9/20/94

COMPANY NAME Valley Asphalt COMPANY REP. ______ PHONE (   ) ______

LOCATION OF FACILITY Morrow ORIGINAL START-UP DATE ______ DESIGNED CAPACITY 300

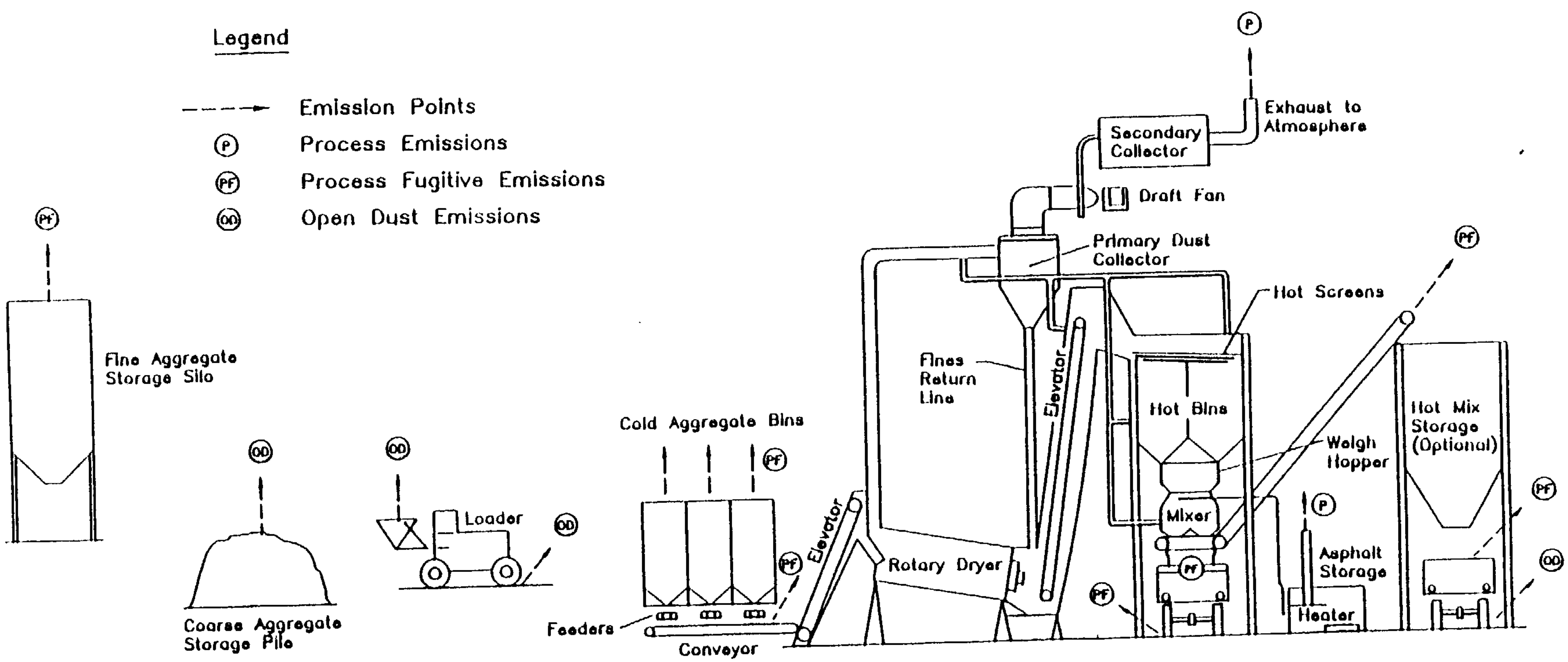
OEM McCarter MODEL NO. M-300-18 TYPE Batch AC TYPE 20

1	2	3	4	5		6	7	8	9		10	11	12
Time (24 HR) NOTE: check small box in column when moisture sample is taken	Fuel Use __ #Fuel Oil __ Nat. Gas ✓ Propane __ Coal __ other	Burner Setting	Blower Pressure	Production Rate		Asphalt Cement	Mix Temp.	Exhaust Gas Temp.	__ Venturi Scrubber ✓ Baghouse		Ambient Temp.	Relative Humidity	Exhaust Damper Position
				✓ Mix Aggregate TPH	✓ RAP TPH	%	°F	°F	Pressure Drop in w.g.	Water Pressure psi	°F	%	
12:15		35%	[illegible]	260	26	4.7%	348°	260°	2	.18			Open
12:30		46%	[illegible]	260	26	4.7%	340	260	2	.18			"
1:00		57%		260	26	4.7%	344	260	2	.18			"
1:15		33%		260	26	4.7%	356	260	2	.18			"
1:30		59%		260	26	4.7%	339	260	2	.18			"
1:45		37%		260	26	4.7%	348	260	2	.18			"
2:00		55%		260	26	4.7%	355	260	2	.18			"
2:15		51%		260	26	4.7%	341	260	2	.18			"
3:25		5%		260	26	4.7%	366	275	2.5	.18			"
3:40		8%		260	26	4.7%	340	270	2.3	.18			"
3:55		58%		260	26	4.7%	343	270	2.2	.18			"
4:10		38%		260	26	4.7%	347	270	2.3	.18			"
4:25		50%		260	26	4.7%	347	270	2.1	.18			"
4:40		64%		260	26	4.7%	337	270	2.1	.18			"
5:30		02%		260	26	4.7%	346	270	2.2	.18			"
5:45		30%		260	26	4.7%	355	270	2.2	.18			"
6:00		15%		260	26	4.7%	351	260	2.3	.18			"
6:15		27%		260	26	4.7%	344	260	2.4	.18			"

n R 04

PAGE ___ OF ___

1 Time (24 HR) NOTE: check small box in column when moisture sample is taken	2 Fuel Use #Fuel Oil ___ Nat. Gas ✓ Propane ___ Coal ___ other ___	3 Burner Setting	4 Blower Pressure	5 Production Rate Mix ✓ Aggregate TPH	5 Production Rate ✓ RAP TPH	6 Asphalt Cement %	7 Mix Temp. °F	8 Exhaust Gas Temp. °F	9 ___ Venturi Scrubber ✓ Baghouse Pressure Drop in w.g.	9 Water Pressure psi	10 Ambient Temp. °F	11 Relative Humidity %	12 Exhaust Damper Position
6 30		18%	[illegible]	260	26	4.7%	352	270	3.3	1.8			open
6 45		35		260	26	4.7%	346	270	3.3	1.8			"



General Process Flow Diagram for A Batch-Mix Asphalt Paving Plant

SECTION C:

EQUIPMENT USED

EQUIPMENT USED

Equipment used to conduct the particulate emissions test was:

A. A Lear Siegler PM-100 stack sampler with appropriate auxiliary equipment and glassware (with train set up according to the schematic on the next page).

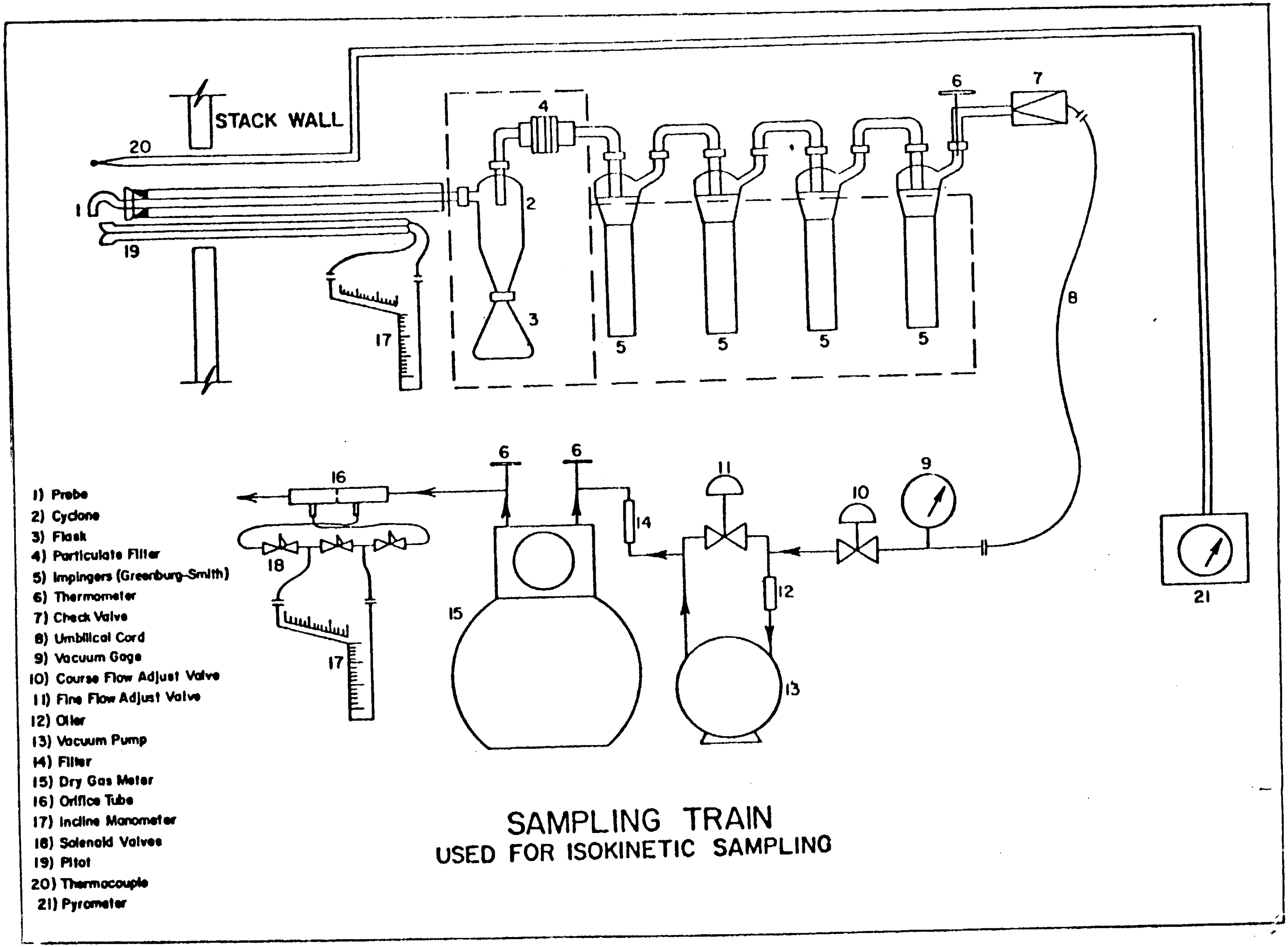
B. An Airguide Instruments Model 211-B (uncorrected) aneroid barometer for checking the barometric pressure.

C. Weston dial thermometers to check meter temperatures or an Analogic Model 2572 Digital Thermocouple to check stack temperatures.

D. A Hays 621 Analyzer to measure the oxygen, carbon dioxide and carbon monoxide content of the stack gases or, for non-combustion sources, a Bacharach Instrument Company Fyrite for gas analysis.

E. Schleicher and Schuell Type 1-HV filters with a porosity of .03 microns.

F. Reagent- or ACS-grade acetone with a residue of $\leq$ .001.


STACK WALL
20
1
19
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
21
1) Probe
2) Cyclone
3) Flask
4) Particulate Filter
5) Impingers (Greenburg-Smith)
6) Thermometer
7) Check Valve
8) Umbilical Cord
9) Vacuum Gage
10) Course Flow Adjust Valve
11) Fine Flow Adjust Valve
12) Oiler
13) Vacuum Pump
14) Filter
15) Dry Gas Meter
16) Orifice Tube
17) Incline Manometer
18) Solenoid Valves
19) Pitot
20) Thermocouple
21) Pyrometer
SAMPLING TRAIN
USED FOR ISOKINETIC SAMPLING

SECTION D:

LABORATORY PROCEDURES AND RESULTS

LABORATORY PROCEDURES FOR PARTICULATE SAMPLING

I. Field Preparation

A. FILTERS: Fiberglass 4" sampling filters are prepared as follows:

Filters are removed from their box and numbered on the back side with a felt pen. The numbering system is continuous from job to job. The filters are placed in a desiccator to dry for at least 24 hours. Clean plastic petri dishes, also numbered, top and bottom, are placed in the desiccator with the filters. After desiccation, the filters are removed, one at a time, and weighed on the Sartorius analytical balance then placed in the correspondingly numbered petri dish. Weights are then recorded in the lab record books. Three filters are used for each complete particulate source emissions test and there should be several extra filters included as spares.

B. SILICA GEL: Silica Gel used for the test is prepared as follows:

Approximately 200 g of silica gel is placed in a wide mouth "Mason" type jar and dried in an oven at 175°C for two hours. The open jars are removed and placed in a desiccator until cool for two hours and then tightly sealed. The jars are then numbered and weighed on the triple beam balance to the closest tenth of a gram. This weight is recorded for each sealed jar. The number of silica gel jars used is the same as the number of filters. Silica gel should be indicating type, 6-16 mesh.

II. Post - Testing Lab Analysis

A. FILTERS: The filters are returned to the lab in their sealed petri dishes. In the lab, the dishes are opened and placed into a desiccator for at least 24 hours. Then the filters are weighed continuously every six hours until a constant weight is achieved. All data is recorded on the laboratory forms that will be bound in the test report.

B. SILICA GEL: The silica gel used in the stack test is returned to the appropriate mason jar and sealed for transport to the laboratory where it is reweighed to a constant weight on a triple beam balance to the nearest tenth of a gram.

C. PROBE RINSINGS: In all tests where a probe washout analysis is necessary, this is accomplished in accordance with procedures specified in "EPA Reference Method 5". These samples are returned to the lab in sealed mason jars for analysis. The front half of the filter holder is washed in accordance with the same procedures and included with the probe wash. Reagent or ACS grade acetone is used as the solvent. The backhalf of the filter holder is washed with deionized water into the impinger catch for appropriate analysis.

D. IMPINGER CATCH: In some testing cases, the liquid collected in the impingers must be analyzed for solid content. This involves a similar procedure to the probe wash solids determination, except that the liquid is deionized water.

E. ACETONE: A blank analysis of acetone is conducted from the one gallon glass container used in the field preparation. This acetone was used in the field for rinsing the probe, nozzle, and top half of the filter holder. A blank analysis is performed prior to testing on all new containers of acetone received from the manufacturer to insure that the quality of the acetone used will be exceed the .001% residual purity standard.

SPECIAL NOTE

When sampling sources high in moisture content, (such as asphalt plants) the filter paper sometimes sticks to the filter holder. When removing the filter, it may tear. In order to maintain control of any small pieces of filter paper which may be easily lost, they are washed with acetone into the probe washing. This makes the filter weight light (sometimes negative) and the probe wash correspondingly heavier. this laboratory procedure is taught by EPA in the "Quality Assurance for Source Emissions Workshop" at Research Triangle Park and is approved by EPA.

WEIGHING PROCEDURE - SARTORIUS ANALYTICAL BALANCE

The Sartorius balance is accurate to 0.1 mg and has a maximum capacity of 200 grams. The balance precision (standard deviation) is 0.05 mg. Before weighing an item, the balance should first be zeroed. This step should be taken before every series of weighings. To do this, the balance should have all weight adjustments at the "zero" position. The beam arrest lever (on the lower left hand side toward the rear of the balance) is then slowly pressed downward to the full release position. The lighted vernier scale on the front of the cabinet should align with the "zero" with the mark on the cabinet. If it is not so aligned, the adjustment knob on the right hand side (near the rear of the cabinet) should be turned carefully until the marks align. Now return the beam arrest to the horizontal arrest position. The balance is now "zeroed".

To weigh an item, it is first placed on the pan. And the sliding doors are closed to avoid air current disturbance. The weight adjustment knob on the right hand side must be at "zero". The beam arrest is then slowly turned upward. The lighted scale at the front of the cabinet will now indicate the weight of the item in grams. If the scale goes past the divided area, the item then exceeds 100 g weight (about 3-1/2 ounces) and it is necessary to arrest the balance (beam arrest lever) and move the lever for 100 g weight away from you. It is located on the left hand side of the cabinet near the front, and is the knob closest to the side of the cabinet. The balance will not weigh items greater than 200 grams in mass, and trying to do this might harm the balance. Remember, this is a delicate precision instrument.

After the beam is arrested in either weight range, the procedure is the same. When the weight of the item in grams is found, "dial in" that amount with the two knobs on the left hand side (near the 100 g lever) color coded yellow and green. As you dial the weight, the digits will appear on the front of the cabinet. When the proper amount is dialed, carefully move the arrest lever down with a slow, steady turn of the wrist. The lighted dial will appear, and the right hand side knob (front of cabinet) is turned to align the mark with the lower of the two lighted scale divisions which the mark appears between. when these marks are aligned, the two lighted digits along with the two indicated on the right hand window on the cabinet front are fractional weight in grams (the decimal would appear before the lighted digits) and the whole number of grams weight is the amount "dialed in" on the left.

In general, be sure that the beam is in "arrest" position before placing weight on or taking weight off of the pan. Don't "dial in" weight unless the beam is arrested. The balance is sensitive to even a hand on the table near the balance, so be careful and painstaking in every movement while weighing.

RAMCON
ENVIRONMENTAL CORPORATION

July 28, 1994

RECEIVED
AUG 1 1994
Hamilton County Department
of Environmental Services

Mr. Fred Brammer
Valley Asphalt Corporation
11641 Mosteller Road
Cincinnati, Ohio 45421
513/771-8400

Dear Mr. Brammer:

Confirming our conversation, weather permitting, RAMCON Environmental Corporation will schedule the emissions test to be conducted at your facility located in Morrow, Ohio. The test will be conducted on September 14, 1994.

The State will want to demonstrate compliance while operating the plant at or near capacity for the duration of the test which will take six to eight hours. We will begin testing soon after you start production on the test date(s).

Should anything come up to alter this schedule, please contact me and I will notify all parties involved. We look forward to working with you.

Sincerely,

George Sumner Buck, III
President

WJSII:vp

cc: Mr. Frank Story
Southwestern Ohio A.P.C. Agency
1632 Central Parkway
Cincinnati, Ohio 45210

Form REC#8

SAMPLE ANALYTICAL DATA FORM

Plant Location Valley asphalT #5 Relative humidity in lab 45 %

Sample Location Morrow, Ohio Density of Acetone (p_a) .7857 mg/ml

Blank volume (V_a) 100 ml

Date/Time wt. blank 9/27 1:00P Gross wt. 46.9149 mg

Date/Time wt. blank 9/28 8:00A Gross wt. 46.9149 mg

Ave. Gross wt. 46.9149 mg

Tare wt. 46.9148 mg

Weight of blank (m_{ab}) .0001 mg

Acetone blank residue concentration (C_a) (C_a) = (M_{ab}) / (V_a) (p_a) = (.000001 mg/g)

Weight of residue in acetone wash: $W_a = C_a V_{aw} p_a$ = (.000001)(250)(.7857) = (.0002)

		Run # 1	Run # 2	Run # 3
Acetone rinse volume (V_{aw})	ml	250	250	250
Date/Time of wt 9/27 1:00P Gross wt	g	99.3799	101.1609	94.6081
Date/Time of wt 9/28 8:00A Gross wt	g	99.3800	101.1609	94.6078
Average Gross wt	g	99.3800	101.1609	94.6080
Tare wt	g	99.3034	101.1172	94.5677
Less acetone blank wt (W_a)	g	.0002	.0002	.0002
Wt of particulate in acetone rinse (m_a)	g	.0764	.0435	.0401

Filter Numbers	#	TS00960	TS00924	TS00899
Date/Time of wt 9/27 1:00P Gross wt	g	.6091	.6060	.6044
Date/Time of wt 9/28 8:00A Gross wt	g	.6090	.6061	.6044
Average Gross wt	g	.6091	.6061	.6044
Tare wt	g	.6000	.5990	.5985

Weight of particulate on filters(s) (m_f)	g	.0091	.0071	.0059
Weight of particulate in acetone rinse	g	.0764	.0435	.0401
Total weight of particulate (m_n)	g	.0855	.0506	.0460

Note: In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be subtracted from the sample weight.

Remarks Heavy particulate - Slight oil deposits

Signature of analyst Thomas Smith Signature of reviewer S. Dick

SECTION E:

CALCULATIONS

DATE: September 20, 1994

NAME: Valley Asphalt Corporation, No. 5
LOCATION: Morrow, Ohio

SUMMARY OF TEST DATA

Permit No. 1483110113P902

			09-20-94	09-20-94	09-21-94	
			Run #1	Run #2	Run #3	
		start	12:58	15:20	17:30	
		finish	14:17	16:44	18:42	
	SAMPLING TRAIN DATA					*
1.	Sampling time, minutes	Θ	75.00	75.00	75.00	
2.	Sampling nozzle diameter, inches	D_n	0.300	0.300	0.300	
3.	Sampling nozzle cross-section area, ft²	A_n	0.000491	0.000491	0.000491	
4.	Isokinetic variation	I	98.4	99.6	102.0	10
5.	Sample gas volume — std. condition, ft³	$V_{m(std)}$	40.465	37.383	39.686	1
6.	Average meter temperature, °R	T_m	548	550	549	
7.	Average orifice pressure drop, inches H_2O	ΔH	0.97	0.83	0.90	
8.	Total Particulate collected, mg.	M_n	85.50	50.60	46.00	
	VELOCITY TRAVERSE DATA					
9.	Stack area, ft²	A	25.00	25.00	25.00	
10.	Absolute stack gas pressure, inches Hg.	P_s	29.95	29.95	29.95	
11.	Barometric pressure, inches Hg.	P_{bar}	29.95	29.95	29.95	
12.	Average absolute stack temperature, R°	T_s	714	710	711	
13.	Average √vel. head, (C_p = .84)	$\sqrt{dP}$	0.49	0.44	0.45	
14.	Average stack gas velocity, ft/second	V_s	33.47	30.02	30.51	7
	STACK MOISTURE CONTENT					
15.	Total water collected by train, ml	V_{ic}	284.00	250.00	242.00	4
16.	Moisture in stack gas, percent (%)	B_{ws}	24.88	23.99	22.32	5
	STACK MOLECULAR WEIGHT					
17.	Percent CO_2 by volume	CO_2	3.0	2.0	3.0	
18.	Percent O_2 by volume	O_2	16.0	14.0	16.0	
19.	Percent CO by volume	CO	0.0	0.0	0.0	
20.	Percent N_2 by volume	N_2	81.0	84.0	81.0	
21.	Dry molecular weight, lb/lb-mole	M_d	29.12	28.88	29.12	3
22.	Stack molecular weight, lb/lb-mole	M_s	26.35	26.27	26.64	6
	EMISSIONS DATA					
23.	Stack gas flow rate, dscf/hr	Q_{sd}	1,675,038.3	1,528,743.9	1,585,599.5	8
24.	Stack gas flow rate, cfm	acfm	50,205	45,030	45,765	
25.	Particulate concentration, gr/dscf	C_s	0.0325	0.0208	0.0179	2
26.	Particulate emission, lb/hr	E	7.79	4.55	4.04	9

* see Calculation No. on following pages

F:\Forms\SummryR3:100694

1. Dry Gas Volume

$$V_m \left[\frac{T_{(std)}}{T_m}\right] \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{P_{std}}\right] = 17.64 \frac{°R}{\epsilon.\ Hg} Y V_m \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}\right]$$

Where:

$V_{m(std)}$ = Dry gas volume through meter at standard conditions, ft^3.
V_m = Dry gas volume measured by meter, ft^3.
P_{bar} = Barometric pressure at orifice meter, in. Hg.
P_{std} = Standard absolute pressure, (29.92 in. Hg.).
T_m = Absolute temperature at meter, °R.
T_{std} = Standard absolute temperature, (528°R).
ΔH = Avg. pressure drop across orifice meter, in. H_2O.
Y = Dry gas meter calibration factor.
13.6 = Inches of water per Hg.

2. Total Contaminants By Weight: Grain Loading

$$C_s = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{M_n}{V_{m(std)}}\right]$$

Where:

C_s = Concentration of particulate (or pollutant) in stack gas, dry basis, corrected to standard conditions, gr/dscf.
M_n = Total amount of particulate (or pollutant) collected, mg.
$V_{m(std)}$ = Dry gas volume through meter at standard conditions, cu. ft.

3. Dry Molecular Weight

$$M_d = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%CO + \%N_2)$$

Where:

M_d = Dry molecular weight, lb/lb-mole.
$\%CO_2$ = Percent carbon dioxide by volume, dry basis.
$\%O_2$ = Percent oxygen by volume, dry basis.
$\%N_2$ = Percent nitrogen by volume, dry basis.
%CO = Percent carbon monoxide by volume, dry basis.
0.264 = Ratio of O_2 to N_2 in air, v/v.
0.28 = Molecular weight of N_2 or CO, divided by 100.
0.32 = Molecular weight of O_2 divided by 100.
0.44 = Molecular weight of CO_2 divided by 100.

4. Water Vapor Condensed

$$V_{wc_{std}} = [V_f - V_i] \left[\frac{P_w \ R \ T_{(std)}}{M_w \ \ P_{(std)}}\right] = 0.04707 \ [V_f - V_i]$$

$$V_{wsg_{std}} = [W_f - W_i] \left[\frac{R \ \ T_{(std)}}{M_w \ \ P_{(std)}}\right] = 0.04715 \ [W_f - W_i]$$

Where:

- 0.04707 = Conversion factor, ft^3/ml.
- 0.04715 = Conversion factor, ft^3/g.
- Vwc_{std} = Volume of water vapor condensed (std. cond.), ml.
- $Vwsg_{std}$ = Volume of water vapor collected in silica gel (standard conditions), ml.
- $V_f - V_i$ = Final volume of impinger contents less initial volume, ml.
- $W_f - W_i$ = Final weight of silica gel less initial weight, g.
- P_w = Density of water, 0.002201 lb/ml.
- R = Ideal gas constant, 21.85 in.Hg. (cu.ft./lb-mole)(°R).
- M_w = Molecular weight of water vapor, 18.0 lb/lb-mole.
- T_{std} = Absolute temperature at standard conditions, 528°R.
- P_{std} = Absolute pressure at standard conditions, 29.92 inches Hg.

5. Moisture Content of Stack Gases

$$B_{ws} = \left[\frac{V_{wc_{std}} + V_{wsg_{std}}}{V_{wc_{std}} + V_{wsg_{std}} + V_{mstd}}\right] \times 100$$

Where:

- B_{ws} = Proportion of water vapor, by volume, in the gas stream.
- V_m = Dry gas volume measured by dry gas meter, dcf.
- Vwc_{std} = Volume of water vapor condensed, corrected to standard conditions, scf.
- $Vwsg_{std}$ = Volume of water vapor collected in silica gel corrected to std. cond., scf.

6. Molecular Weight of Stack Gases

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

Where:

- M_s = Molecular weight of stack gas, wet basis (lb./lb.-mole).
- M_d = Molecular weight of stack gas, dry basis (lb./lb.-mole).

7. Stack Gas Velocity

$$V_s = K_p \quad C_p \quad \left[\sqrt{\Delta P}\right] \text{avg} \quad \sqrt{\frac{T_s(\text{avg})}{P_s \quad M_s}}$$

Where:

- V_s = Average velocity of gas stream in stack, ft/sec.
- K_p = 85.49 ft/sec [(g/g-mole) — (mm Hg)/(°K)(mm H_2O]$^{1/2}$
- C_p = Pitot tube coefficient, dimensionless.
- ΔP = Velocity head of stack gas, in. H_2O.
- P_{bar} = Barometric pressure at measurement site, in. Hg.
- P_g = Stack static pressure, in. Hg.
- P_s = Absolute stack gas pressure, in. Hg. = $P_{bar} + P_g$
- P_{std} = Standard absolute pressure, 29.92 in. Hg.
- t_s = Stack temperature, °F.
- T_s = Absolute stack temperature, °R. = 460 + t_s.
- M_s = Molecular weight of stack gas, wet basis, lb/lb-mole.

8. Stack Gas Flow Rate

$$Q_{sd} = 3600 \left[1 - B_{wc} \right] V_s \quad A \left[\frac{T_{std}}{T_{stk}} \right] \left[\frac{P_s}{P_{std}} \right]$$

Where:

- Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions (dscf/hr).
- A = Cross sectional area of stack (ft^2).
- 3600 = Conversion factor (sec/hr).
- T_{stk} = Absolute stack temperature (°R).
- T_{std} = Standard absolute temperature (528°R).
- P_{bar} = Barometric pressure at measurement site (in. Hg.).
- P_g = Stack static pressure (in. Hg.).
- P_s = Absolute stack gas pressure (in. Hg.) = $P_{bar} + P_g$
- P_{std} = Standard absolute pressure (29.92 in. Hg.).

9. Emissions Rate From Stack

$$E = \left[\frac{(C_s')\ (Q_{sd})}{7{,}000\ gr/lb}\right] = lb/hr$$

Where:

- E - Emissions rate, lbs/hr.
- C_s - Concentration of particulate (or pollutant) in stack gas, dry basis, corrected to standard conditions, gr/dscf.
- Q_{sd} - Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

10. Isokinetic Variation

$$I = 100\ T_s \left[\frac{(0.002669)\ (V_{ic} + \left(\frac{Y_i\ V_m}{T_m}\right)\ (P_{bar} + \Delta H/13.6)}{60\ \theta\ V_s\ P_s\ A_n}\right]$$

Where:

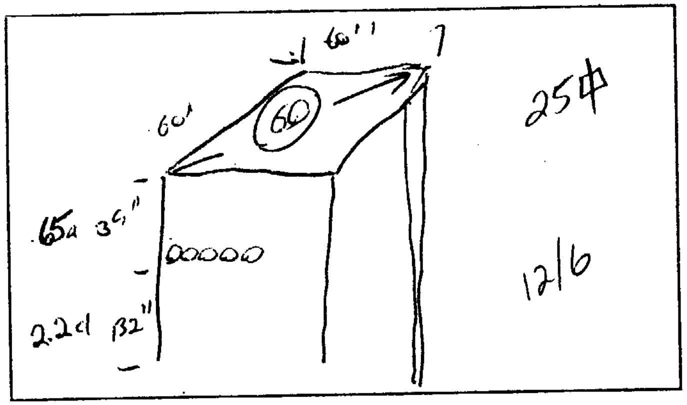
- I - Percent isokinetic sampling.
- 100 - Conversion to percent.
- T_s - Absolute average stack gas temperature, °R.
- 0.002669 - Conversion factor, Hg - ft^3/ml - °R.
- V_{ic} - Total volume of liquid collected in impingers and silica gel, ml.
- T_m - Absolute average dry gas meter temperature, °R.
- P_{bar} - Barometric pressure at sampling site, in. Hg.
- ΔH - Average pressure differential across the orifice meter, in. H_2O.
- 13.6 - Specific gravity of mercury.
- 60 - Conversion seconds to minutes.
- Θ - Total sampling time, minutes.
- V_s - Stack gas velocity, ft/sec.
- P_s - Absolute stack gas pressure, in. Hg.
- A_n - Cross sectional area of nozzle, ft^2.
- Y_i - Calibration factor.

SECTION F:

FIELD DATA

RAMCON Environmental Corporation

Plant: Valley #5
Location: [illegible], OH
Operator: KB
Date: 9/21/94
Run No. 1
Sample Box No. 1
Meter Box No. Nutec #2
Meter H @ 1.916
C Factor 1.023
Pitot Tube Coefficient Cp .84



Schematic of Stack Cross Section

Ambient Temperature 75
Barometric Pressure 29.95
Assumed Moisture, % 29
Probe Length, m (ft) 5
Probe Heater Setting 4
Nozzle Identification No. 0004909
Avg. Calibrated Nozzle Dia., (in.) .300/.300/.300
Leak Rate, m³/min. (cfm) .011 @5"
Static Pressure, mm Hg (in. Hg) 1.10
Filter No. TS00960

	Impinger Volume, ml	Silica Gel Weight, g
Final	1414	418
Initial	200	418
Difference	214	0

25/75

Traverse Point No.	Sampling Time (⊖) min.	Vacuum in. Hg	Stack Temperature (T_s) °F	Velocity Head (P_s) in H_2O	Pressure Diff. Orf. Meter in H_2O	Gas Sample Volume, ft³	Gas Sample Temperature at Dry Gas Meter °F Inlet	Outlet	Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
1	12:58 / 13:01	2	230	.15	.60	32.405 / 33.9	85	84	244	68
2	13:04	2	246	.15	.60	35.2	85	84	252	68
3	13:07	2	250	.18	.71	36.6	85	84	264	63
4	13:10	2	251	.17	.67	38.0	87	85	261	59
5	13:13	3	254	.19	.75	39.5	87	84	254	59
1	13:14 / 13:17	3	250	.20	.79	41.0	86	84	256	63
2	13:20	3	256	.21	.83	42.7	89	86	253	62
3	13:23	3	257	.20	.79	44.2	90	86	253	62
4	13:26	3	256	.18	.71	45.7	91	86	257	63
5	13:29	3	255	.17	.67	47.1	92	87	256	65
1	13:30 / 13:33	4	246	.30	1.2	49.2	89	85	256	66
2	13:36	4	254	.31	1.2	51.0	89	85	251	61
3	13:39	4	256	.30	1.2	53.0	90	86	251	59
4	13:42	4	259	.27	1.1	54.7	93	87	256	61
5	13:45	4	260	.24	.95	56.5	95	88	257	62

F:\Forms\18-00001

RAMCON emissions test log sheet, cont. Date 9/20/94 Location Morrow, ON Test No. 1 2614

Traverse Point No.	Sampling Time (Θ) min.	Vacuum in. Hg	Stack Temperature (T_S) °F	Velocity Head (P_S) in H_2O	Pressure Diff. Orf. Meter in H_2O	Gas Sample Volume, ft³	Gas Sample Temperature at Dry Gas Meter °F		Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
							Inlet	Outlet		
1	~~13:46~~ 13:49	4	255	.29	1.1	58.3	92	87	257	63
2	13:52	4	257	.31	1.2	60.7	93	87	257	61
3	13:55	4	254	.29	1.1	61.9	91	86	255	55
4	13:58	4	254	.28	1.1	63.7	92	87	255	62
5	14:01	4	253	.30	1.2	65.5	90	86	249	60
1	~~14:02~~ 14:05	4	257	.28	1.1	67.3	90	86	258	63
2	14:08	4	260	.30	1.2	69.2	92	88	257	60
3	14:11	4	262	.28	1.1	71.0	95	88	254	60
4	14:14	4	258	.29	1.1	72.8	91	86	257	58
5	14:17	4	256	.30	1.2	74.653	91	86	257	58
			253.84	.492	.9668	41.748	87.96			

RAMCON Environmental Corporation

Plant Volly #5
Location Merron, ON
Operator RB
Date 9/20/94
Run No. 2
Sample Box No. 1
Meter Box No. Nutec #2
Meter H @ 1.91
C Factor 1.002
Pitot Tube Coefficient Cp .84

Ambient Temperature 80
Barometric Pressure 29.95
Assumed Moisture, % 25
Probe Length, m (ft) 5
Probe Heater Setting 4
Nozzle Identification No. 0001909
Avg. Calibrated Nozzle Dia., (in.) .300/.300/.300
Leak Rate, m³/min. (cfm) .016 @ 6"
Static Pressure, mm Hg (in. Hg) 1.15
Filter No. TS00624

	Impinger Volume, ml	Silica Gel Weight, g
Final	450	422
Initial	200	422
Difference	250	0

4.21

Schematic of Stack Cross Section

Traverse Point No.	Sampling Time (Θ) min.	Vacuum in. Hg	Stack Temperature (T_s) °F	Velocity Head (P_s) in H_2O	Pressure Diff. Orf. Meter in H_2O	Gas Sample Volume, ft³	Gas Sample Temperature at Dry Gas Meter °F		Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
							Inlet	Outlet		
1	15:20 / 15:23	2	233	.40	.42	75.950 / 77.1	88	87	262	67
2	15:26	2	248	.14	.59	78.4	88	87	256	68
3	15:29	2	254	.12	.51	79.8	90	88	252	65
4	15:32	2	253	.10	.42	80.9	89	87	255	63
5	15:35	2	253	.10	.42	82.0	90	88	255	64
1	15:38 / 15:41	3	241	.19	.80	83.5	87	86	257	68
2	15:44	3	252	.19	.80	85.1	88	87	251	61
3	15:47	3	253	.16	.67	86.4	91	88	251	63
4	15:50	3	251	.15	.63	87.8	93	89	258	65
5	15:53	3	250	.16	.67	89.2	94	89	261	65
1	15:56 / 15:59	3	250	.18	.76	90.7	93	90	253	68
2	16:02	4	249	.20	.84	92.3	93	89	253	65
3	16:05	4	255	.19	.80	94.0	95	90	254	64
4	16:09	4	255	.15	.63	95.3	98	90	256	64
5	16:10	3	252	.13	.55	96.5	95	90	256	65

RAMCON emissions test log sheet, cont. Date 9/20/94 Location Marcou, ON Test No. 2

Traverse Point No.	Sampling Time (Θ) min.	Vacuum in. Hg	Stack Temperature (T_s) °F	Velocity Head (P_s) in H_2O	Pressure Diff. Orf. Meter in H_2O	Gas Sample Volume, ft³	Gas Sample Temperature at Dry Gas Meter °F Inlet	Gas Sample Temperature at Dry Gas Meter °F Outlet	Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
1	~~11:12~~ 16:15	4	247	.25	1.1	98.4	91	88	252	60
2	16:18	4	251	.27	1.1	100.2	92	89	252	60
3	16:21	4	252	.21	.89	101.8	93	90	258	61
4	16:24	4	254	.16	.76	103.3	95	91	258	62
5	16:27	4	253	.19	.91	104.9	94	90	252	60
1	~~16:29~~ 16:32	8	250	.30	1.3	106.8	93	90	257	69
2	16:35	5	252	.30	1.3	108.8	93	89	260	61
3	16:38	5	253	.31	1.3	110.8	92	89	257	58
4	16:41	5	251	.32	1.4	112.8	91	88	251	59
5	16:44	5	250	.31	1.3	114.672	92	89	253	60
			250.48	.436	.831	38.722	90.26			

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Plant Valley #5
Location Marlow, OH
Operator B
Date 5/20/99
Run No. 3
Sample Box No. 1
Meter Box No. Nutes #2
Meter H @ 1.976
C Factor 1.023
Pitot Tube Coefficient Cp .84

Ambient Temperature 75
Barometric Pressure 29.95
Assumed Moisture, % 25
Probe Length, m (ft) 5
Probe Heater Setting 4
Nozzle Identification No. 0027909
Avg. Calibrated Nozzle Dia., (in.) .300/.300/.300
Leak Rate, m³/min. (cfm) .012 @ 6"
Static Pressure, mm Hg (in. Hg) +.15
Filter No. B00899

	Impinger Volume, ml	Silica Gel Weight, g
Final	442	431
Initial	200	431
Difference	242	0

Schematic of Stack Cross Section

Traverse Point No.	Sampling Time (Θ) min.	Vacuum in. Hg	Stack Temperature (T_s) °F	Velocity Head (P_s) in H_2O	Pressure Diff. Orf. Meter in H_2O	Gas Sample Volume, ft³	Gas Sample Temperature at Dry Gas Meter °F Inlet	Outlet	Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
1	17:30 / 17:33	2	245	.10	.42	114.899 / 116.1	85	85	244	68
2	17:36	2	253	.15	.63	117.4	86	86	240	65
3	17:39	2	257	.10	.42	118.7	86	85	263	61
4	17:42	2	254	.11	.46	119.8	85	85	256	60
5	17:45	2	254	.12	.50	121.0	87	86	250	60
1	17:45 / 17:48	2	251	.16	.66	122.5	87	85	255	61
2	17:51	3	252	.18	.76	124.1	88	84	256	60
3	17:54	3	254	.14	.59	125.6	89	86	256	60
4	17:57	3	254	.15	.64	127.0	91	86	254	60
5	18:00	3	253	.14	.59	128.5	92	87	257	58
1	18:01 / 18:04	4	251	.25	1.1	130.2	91	87	255	59
2	18:07	4	253	.21	.89	131.8	92	86	255	55
3	18:10	4	253	.24	1.0	133.6	92	87	253	55
4	18:13	4	253	.20	.85	135.2	94	87	253	56
5	18:16	4	252	.20	.85	136.8	94	87	255	55

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RAMCON emissions test log sheet, cont. Date 9/22/94 Location Marion, OH Test No. 3

Traverse Point No.	Sampling Time (Θ) min.	Vacuum in. Hg	Stack Temperature (T_s) °F	Velocity Head (P_s) in H_2O	Pressure Diff. Orf. Meter in H_2O	Gas Sample Volume, ft³	Gas Sample Temperature at Dry Gas Meter °F Inlet	Gas Sample Temperature at Dry Gas Meter °F Outlet	Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
1	16:11 / 16:14	4	249	.29	1.2	136.7	93	88	256	61
2	16:17	4	250	.31	1.3	140.7	93	88	254	55
3	16:20	4	249	.31	1.3	142.7	95	88	247	60
4	16:23	4	248	.24	1.1	144.5	96	88	254	61
5	16:26	4	248	.21	.99	146.3	97	89	259	62
1	16:27 / 16:30	4	250	.30	1.3	146.2	98	89	253	64
2	16:33	4	248	.31	1.3	150.2	97	89	248	61
3	16:36	4	249	.30	1.3	151.9	97	89	255	61
4	16:39	4	246	.29	1.2	153.6	97	89	261	61
5	16:42	4	248	.26	1.1	155.925	97	89	260	61
			251	.452	.995	41.028	93.12			

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SECTION G:

CALIBRATION

4A

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? ✓ yes ______ no

Pitot tube openings damaged? ______ yes (explain below) ✓ no

α_1 = 1.3 ° (<10°), α_2 = 0.8 ° (<10°), β_1 = 0.5 ° (<5°), β_2 = 1.8 ° (<5°)

γ = 2.9 °, θ = 1.7 °, A = .97 cm (in.)

$z = A \sin \gamma$ = .05 cm (in.); <0.32 cm (<1/8 in.), $w = A \sin \theta$ = .03 cm (in.); <.08 cm (<1/32 in.)

P_A .48 cm (in.) P_b .49 cm (in.)

D_t = .38 cm (in.)

Comments: ______________________

Calibration required? ______ yes ✓ no

4B

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? ✓ yes ______ no

Pitot tube openings damaged? ______ yes (explain below) ______ no

α_1 = 2.3 ° (<10°), α_2 = .5 ° (<10°), β_1 = 1.8 ° (<5°),
β_2 = 1.8 ° (<5°)

γ = 3.2 °, θ = 1.0 °, A = .98 cm (in.)

$z = A \sin \gamma$ = .05 cm (in.); <0.32 cm (<1/8 in.),
$w = A \sin \theta$ = .02 cm (in.); <.08 cm (<1/32 in.)

P_A .49 cm (in.) P_b .49 cm (in.)

D_t = .38 cm (in.)

Comments: ______________________________

Calibration required? ______ yes ✓ no

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 3-11-93 Thermocouple number 523

Ambient temperature ________ °C Barometric pressure ________ in. Hg

Calibrator ________ Reference: mercury-in-glass ________

Other ________

Reference point number[a]	Source[b] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference[c] %
a	Ice water	32	33	
B	Boiling water	212	210	
C	hot oil	550	548	

[a]Every 30°C (50°F) for each reference point.

[b]Type of calibration system used.

[c]

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

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English Units)

Test No. ______ Date 9/25 Meter Box No. Nutech ? Plant No. ______

Barometric Pressure P_b = 30.23 in.Hg Dry Gas Meter No. 1552696 Pretest Y ______

Orifice Manometer Setting (ΔH), in. H_2O	Gas Volume: Wet Test Meter (V_w) ft³	Gas Volume: Dry Gas Meter (V_d) ft³	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 Avg.† (t_d) °F	Time (Θ) min	Vacuum Setting in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
1.0	10	300.835 / 306.697	74°	80 / 80	86 / 88	83.5	9:06	9"	.977	1.816
2.0	10	290.334 / 300.597	74°	82 / 80	80 / 88	81.5	13.1	7"	.983	1.895
3.0	10	279.932 / 290.191	74°	78 / 84	70 / 78	79	10:56	5"	.976	1.855
									Y = .978	1.855

† If there is only one thermometer on the dry gas meter, record the temperature under t_d where:

V_w = Gas volume passing through the wet test meter, ft³.
V_d = Gas volume passing through the dry gas meter, ft³.
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 ± 0.05Y.
P_b = Barometric pressure, in. Hg.
Θ = Time of calibration run, minutes.

$$\Delta H @ 1 = \frac{(0.0317)(\Delta H)}{P_b (t_d + 460)} \left[\frac{(t_w + 460)\Theta}{V_w} \right]^2$$

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POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test number ________ Date 9/30/94 Meter box number Nutech 2 Plant ________

Barometric pressure, P_b = 30.30 in. Hg Dry gas meter number ________ Pretest Y ________

Orifice manometer setting, (ΔH), in. H_2O	Gas volume		Temperature				Time (θ), min	Vacuum setting, in. Hg	Y_i	Y_i
	Wet test meter (V_w), ft^3	Dry gas meter (V_d), ft^3	Wet test meter (t_w), °F	Dry gas meter Inlet (t_{d_i}), °F	Dry gas meter Outlet (t_{d_o}), °F	Dry gas meter Average[a] (t_d), °F				$\frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
3.0	10	424.015 / 434.411	74	91 / 98	86 / 88	90.75	10.91		.980	Ok 1.93
2.0	10	434.641 / 445.992	74	96 / 103	89 / 92	95	14.55		.995	1.878
1.0	10	446.269 / 457.914	74	100 / 103	90 / 95	97	20.52		.983	1.86
									Y = .986	1.896

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

where

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 ± 0.05Y.

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min.

SECTION H:

RAMCON PERSONNEL

Name: Mr. Sumner Buck
Title: President

Qualifications: Mr. Buck is a graduate of the University of Mississippi with graduate studies at Memphis State University and State Technical Institute of Memphis. He is a graduate of the EPA 450 "Source Sampling for Particulate Pollutant's" course and the 474 "Continuous Emissions Monitoring" courses outlined by EPA at Research Triangle Park, N.C. He has been directly involved in conducting and supervising air emission testing for over 15 years. He has personally conducted over 400 air emission tests. He currently sponsors and directs visual emission certification schools for US EPA Method 9.

Project Duties: Mr. Buck is responsible for the overall supervision of each testing project. This includes the correspondence to the State Regulatory Agency and the plant personnel regarding scheduling, testing requirements, etc. He will assist in supervision of the project preparation for each team involved and the overall organization between the testing crew(s) and facility.

Name: Mr. Joe Sewell
Title: Vice President

Qualifications: Mr. Sewell is currently serving as the Vice President of RAMCON Environmental Corporation. Mr. Sewell is a graduate of Christian Brothers University in Memphis, Tennessee where he obtained a Bachelor of Science degree in Chemical Engineering. He has conducted and supervised air emissions testing projects ranging a broad spectrum of facility process categories. His accomplishments include the development of the instrumental branch of emissions testing utilizing continuous emission monitors and gas chromatography. Mr. Sewell performs a major role in the upgrading of testing capabilities and professional quality that RAMCON Environmental Corporation offers.

Project Duties: Mr. Sewell provides staff engineering and project administration to ensure the integrity of the requested services. He serves as the primary contact person for RAMCON Environmental Corporation handling all correspondence between the facility personnel involved in the project and respective state agency representative(s). He provides project leadership to RAMCON Environmental Corporation field supervisors and managers involved in the testing project.

Name: Mr. Ray Jenkins
Title: Source Sampling Director

Qualifications: Mr. Jenkins is serving as the Source Sampling Director for RAMCON Environmental Corporation. He was promoted to this leadership position after gaining a significant amount of experience in conducting and providing field supervision of a variety of air testing projects. Mr. Jenkins has personally conducted and/or supervised all of the prevalent EPA approved procedures with expertise in the instrumental analyzer procedures. He graduated from Memphis State University obtaining a Bachelor of Science degree in Biology. He is also currently certified to conduct US EPA Reference Method 9 for the visual determination of emission opacity.

Project Duties: Mr. Jenkins provides project leadership to the Team Leaders and Field Technicians. He ensures the test crew(s) involved in the test project will be properly informed to his respective duties and responsibilities during the testing process. Mr. Jenkins also serves as the Quality Assurance/Quality Control Coordinator and provides guidance in QA/QC to each Team Leader with regard to sample integrity.

Name: Mr. Tommy South
Title: Laboratory Technician

Qualifications: Mr. South is currently serving as Laboratory Technician. He is proficient in conducting many analysis procedures such as front and back-half particulate analysis, titrations, extractions, etc.

Project Duties: Mr. South conducts the laboratory analysis on the particulate samples. He is also responsible for accepting the remaining field samples from the Field Sample Bank

Manager and performing inspection as to integrity. He documents the transfer on the chain of custody forms and distributed the subcontracted samples to the respective laboratories.

Name: Mr. Allen Turner
Title: Team Leader

Qualifications: Mr. Turner has been employed with RAMCON Environmental Corporation for five years. Altogether, he has sampled approximately 300 stacks of all types. Mr. Turner became qualified for a Team Leader in 1988 and has served as such since that time. He is a current V.E. reader and continues his studies at State Technical Institute in Memphis, Tennessee. Mr. Turner has extensive experience in EPA Methods 1-9.

Project Duties: Mr. Turner is responsible for isokinetic sampling procedures, including but not limited to, Method 5 for particulate, multi-metals, PAH, calibration and cleaning of necessary equipment for his testing. His duties on-site include assembling the sample train, leak checking the system, operation of the train and recording the test data on the field data forms.