JOHN ASHCROFT
Governor

G. TRACY MEHAN III
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MEMORANDUM

Division of Energy
Division of Environmental Quality
Division of Geology and Land Survey
Division of Management Services
Divisionof Parks, Recreation,
and Historic Preservation

DATE: SEPT 2, 1994

TO: County file: LACLEDE
Facility: Willard Asphalt Paving Co
Location: Lebanon, MO

FROM: Doug Elley

SUBJECT: COMPLIANCE TEST RESULTS Test Date: Aug. 9-10, 1994

Testing firm: RAMCON

Test team leader: Leon Evans
Source tested: CM1 - Dryer-drum stationary asphalt plant

Pollutants tested for: PM
Opacity

	% Iso	ft³ samp.	lb/hr	ppm	gr/dscf	gr/dscf corr.	Allowed	Opac%
Run #1	108	48.1			.0255		.04	
Run #2	104.1	47.6			.0227			
Run #3	105.7	48.1			.0136			
Averages					.02		.04	1

Rated production/operation capacity:

Production/operation rate during test: 300 ton/hr

Fuel used: #2 Fuel Oil Rate: Analysis:

Combustion Efficiency =CE= $\frac{CO_2}{CO_2 + CO}$ x 100 = ____x100 =____

Control device: Baghouse
Secondary chamber volume (measured): ____

Retention time: Run #1____ Run #2____ Run #3____
Av.= ____ seconds

Pressure drop(s): 2" H2O
Scrubber supply line water psi: ____

STATE OF MISSOURI
Mel Carnahan, Governor • David A. Shorr, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

September 2, 1994

Mr. Bradley Willard
Willard Asphalt Paving Co., Inc.
Rt. 5, Box 274
Lebanon, MO 65536

Dear Mr. Willard:

My staff has completed a review of the results of emission testing conducted by RAMCON on your new CMI dryer-drum stationary asphalt plant (Model PVM-375, S/N 104) on August 9-10, 1994, located a mile north of Lebanon, MO, on Rd.44202.

The results indicate an average particulate emission rate of 0.02 grains/dry standard cubic foot (gr/dscf), based on the first three runs. Plume opacity averaged 1%. Both of these values were well within the federal New Source Performance Standards (NSPS) limits of 0.04 gr/dscf for particulate and 20% opacity, at the time of testing.

Asphaltic concrete production during the tests averaged a rate of 300 tons/hour. Hence, in accordance with Permit #0494-021, production shall not exceed 100,000 tons/year, or 300 tons/hour, under the authority granted by the permit.

By this letter we acknowledge that the performance testing requirement in your permit has been met and compliance of the plant with the NSPS, Subpart I, limits has been demonstrated on the date of the above testing. Continued compliance will be dependent upon the quality of maintenance of your emission control system.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Steven Feeler
Acting Chief of Enforcement

SF/dep

c. Tracy McCracken, DNR/Southwest Regional Office

RAMCON
ENVIRONMENTAL CORPORATION

Source Sampling for Particulate Emissions

C.M.I. Drum-Mix Baghouse
Permit No. 0494-021

WILLARD ASPHALT PAVING, INC.
LEBANON, MISSOURI
August 9-10, 1994

Bradley Willard
Willard Asphalt Paving, Inc.

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

August 16, 1994

Mr. Bradley Willard
Willard Asphalt Paving, Inc.
Route 5, Box 274
Lebanon, Missouri 65536

RE: Particulate Emissions Test: August 9-10, 1994

Dear Mr. Willard:

Enclosed you will find four (4) copies of our report on the particulate emissions test we conducted pursuant to permit no. 0494-021 at your asphalt plant located in Lebanon, Missouri. Based on our test results, the average grain loading of the five (5) test runs do pass the standards set by the State of Missouri. Therefore, the plant is operating in compliance with State standards.

You will want to sign the report covers and send two copies to:

Mr. Doug Elley
Missouri Department of Natural Resources
Division of Environmental Quality
P. O. Box 176
Jefferson City, Missouri 65102

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

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SECTION A:

1. INTRODUCTION
2. TEST RESULTS
3. TEST PROCEDURES

SECTION A.

1. INTRODUCTION

On August 9-10, 1994 personnel from RAMCON Environmental Corporation conducted a source emissions test pursuant to permit no. 0494-021 for particulate emissions compliance at Willard Asphalt Paving, Inc.'s C.M.I. drum-mix asphalt plant located in Lebanon, Missouri. RAMCON personnel conducting the test were Leon Evans, Team Leader, and E.T. Crook. 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. Evans 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 Missouri.

Mr. Doug Elley of Missouri's Department of Natural Resources observed the testing conducted by RAMCON Environmental Corporation. E.T. Crook of RAMCON Environmental conducted the opacity test which ranged from zero (0) to five (5) percent over the five (5) runs and therefore meets N.S.P.S. requirements.

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 Missouri are the same as those set by EPA.

SUMMARY OF TEST RESULTS

August 9-10, 1994

Test Run	Time	Actual Emissions gr/dscf	Emissions lbs/hr	Isokinetic Variation %
1	10:55 - 12:33	0.0255	4.89	108.0
2	14:30 - 16:00	0.0227	4.47	104.1
3	17:30 - 19:00	0.0136	2.66	105.7
4	08:10 - 09:35	0.0100	1.94	101.3
5	10:17 - 12:05	0.0070	1.38	102.0
	Average:	0.0158	3.07	

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

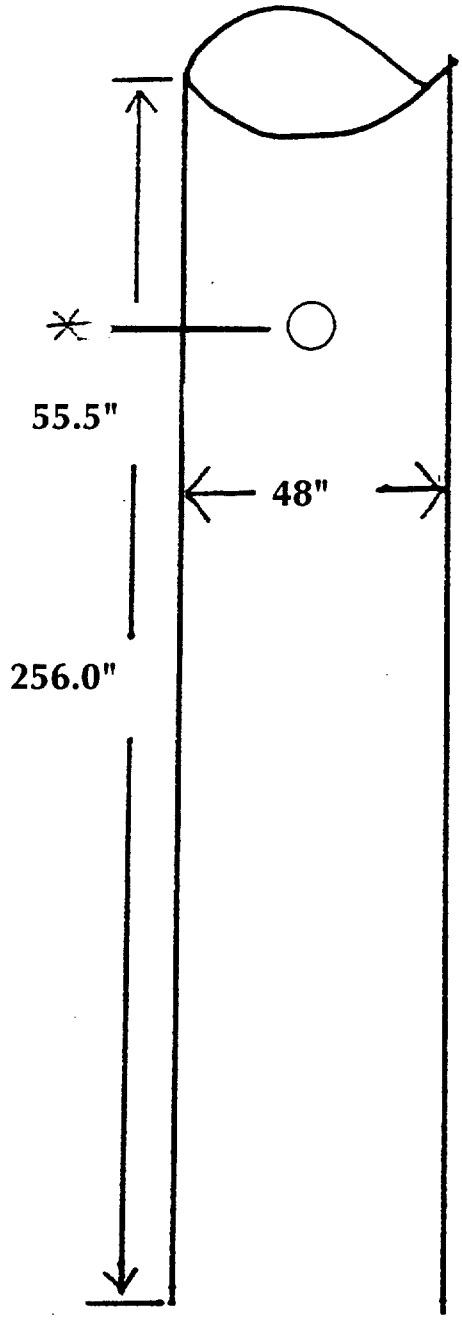
3. TEST PROCEDURES

(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: A fourth and fifth test run were completed as an indication of improved plant performance. Apparently some water had accumulated in the bottom of the fan while the plant was out as service. During this period rust formed. When the test started, the rust and water were gradually blown out of the stack. This adversely affected the test results. Once all this rusty water was gone, the plant emissions improved to the levels indicated in the last three test runs.

(c) Sampling Site: The emissions test was conducted after a baghouse on a rectangular stack measuring 64" x 48" with an equivalent diameter of 54.9". Five (5) sampling ports were placed 55.5" down (1.0 diameters upstream) from the top of the stack and 256" up (4.7 diameters downstream) from the last flow disturbance. The ports were evenly spaced on 9.6" centers. The two outside ports are 4.8" from the side walls of the stack. Twenty-five (25) points were sampled, five (5) through each port for two and one-half (2½) minutes each for a total testing time of sixty-two and one-half (62½) minutes.

Points on a Diameter	Probe Mark*
1	6.4"
2	19.2"
3	32.0"
4	44.8"
5	57.6"



SECTION B:

THE SOURCE

THE SOURCE

Willard Asphalt Paving, Inc. employs a C.M.I. drum-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 halfway down the drum through a separate conveyor. The required amount of hot asphalt oil is then injected onto and mixed into the dried aggregate. The now newly formed hot asphalt mix is pulled to the top of a storage silo by a conveyor. 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 drum mixer uses a burner fired with no. 2 fuel oil to heat air to dry the aggregate, and the motion of the rotating drum to blend the aggregate. The air is drawn into the system via an exhaust fan. After passing through the gas burner and the mixing drum, the air passes through a baghouse. The baghouse is manufactured by C.M.I.. The exhaust gases are 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 drum mixer.

FORM REC#03

DATA ON FACILITY BEING STACK TESTED

TODAY'S DATE: 8-10-94

COMPANY NAME Willard Asphalt Paving COMPANY REP. Clifford Wells PHONE 417 588 2939

LOCATION OF FACILITY Lebanon Mo ORIGINAL START-UP DATE June 94 DESIGNED CAPACITY 375 TPH

OEM CMI MODEL NO. PVM 375 TYPE Drum Mix AC TYPE AC 20

1 Time (24 HR) NOTE: check small box in column when moisture sample is taken	2 Fuel Use (2 #Fuel Oil, Nat. Gas, Propane, Coal, other)	3 Burner Setting	4 Blower Pressure	5 Production Rate: X Mix, Aggregate (TPH)	5 Production Rate: RAP (TPH)	6 Asphalt Cement %	7 Mix Temp. °F	8 Exhaust Gas Temp. °F	9 Venturi Scrubber, X Baghouse: Pressure Drop in w.g.	9 Venturi Scrubber, X Baghouse: Water Pressure psi	10 Ambient Temp. °F	11 Relative Humidity %	12 Exhaust Damper Position
8:10	#2	45	.20	291	—	5.8	295	251	1.8	—	75°	—	39
8:28	#2	59	.26	291	—	6.1	290	249	1.9	—	75°	—	44
8:41	#2	58	.20	291	—	6.1	300	256	1.9	—	75°	—	40
9:00	#2	55	.22	291	—	6.0	305	257	2.1	—	75°	—	40
9:15	#2	48	.2	293	—	6.0	290	250	2.	—	75°	—	40
9:30	#2	48	.21	291	—	6.0	295	253	2	—	75°	—	40
10:55	#2	48	.2	295	—	6.0	300	225	2	—	79°	—	40
11:10	#2	44	.24	296	—	6.0	300	247	1.9	—	80°	—	37
11:25	#2	46	.26	292	—	6.0	300	251	1.9	—	86°	—	40
11:40	#2	44	.28	291	—	6.0	295	251	1.9	—	88°		40
11:55	#2	45	.22	290	—	6.0	290	247	1.9	—	88°		40
12:10	#2	45	.28	292	—	6.0	295	249	2	—	88°	—	40

FORM REC#03

DATA ON FACILITY BEING STACK TESTED

TODAY'S DATE: 8-9-94

COMPANY NAME Willard Asphalt Paving COMPANY REP. Clifford Wells PHONE (417) 588 2939

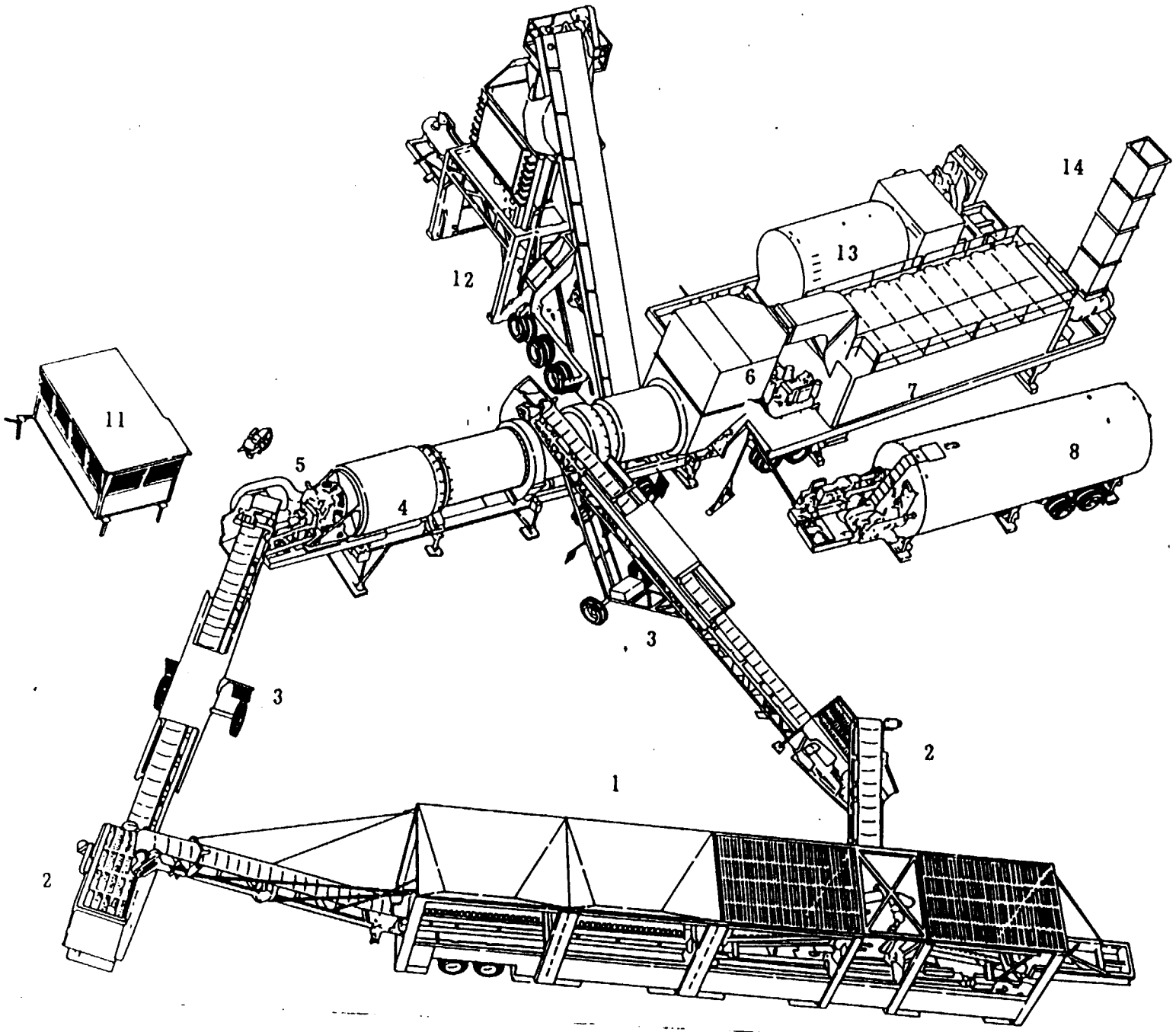
LOCATION OF FACILITY Lebanon MO ORIGINAL START-UP DATE June 94 DESIGNED CAPACITY 375 TPH

OEM CMI MODEL NO. PUM 375 TYPE Drum Mix AC TYPE AC 10

1 Time (24 HR) NOTE: check small box in column when moisture sample is taken	2 Fuel Use	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 Venturi Scrubber/Baghouse Water Pressure psi	10 Ambient Temp. °F	11 Relative Humidity %	12 Exhaust Damper Position
9:10	#2	48	.21	305	0	5.8	290	256	2	NA	80°	—	45
9:25	#2	48	.21	305	0	5.8	290	262	2	NA	80°	—	41
10:40	#2	48	.21	307	0	5.8	290	248	2	NA	84°	—	40
11:00	#2	56	.22	301	0	5.8	290	261	2	NA	84°	—	44
11:16	#2	55	.22	300	0	5.8	297	277	2	NA	84°	—	44
11:28	#2	55	.22	298	0	5.8	290	275	2	NA	84°	—	44
11:45	#2	55	.22	299	0	5.8	295	274	2	NA	84°		44
12:00	#2	54	.21	301	0	5.8	290	276	2	NA	85°		43
12:22	#2	54	.23	300	0	5.8	290	262	2	NA	86°		44
4:32	#2	52	.21	302	0	5.8	290	255	1.9	NA	85°		40
4:50	#2	54	.23	302	0	5.8	300	271	2	NA	85°		40
5:05	#2	53	.25	300	—	5.8	295	272	1.9	NA	85°		40
5:15	#2	54	.2	301	—	5.8	295	275	2	NA	83°		40
5:30	#2	54	.2	300	—	5.8	290	273	2	NA	80°		40
5:45	#2	54	.2	301	—	5.8	295	270	2	NA	80°		40
6:00	#2	54	.2	300	—	5.8	290	271	2	NA	80°		40
17:40	#2	54	.24	311	—	5.8	290	253	1.9	NA	80°		40
17:55	#2	55	.23	300	—	5.8	295	269	1.8	NA	80°		40

PAGE ___ OF ___

1 Time (24 HR) NOTE: check small box in column when moisture sample is taken	2 Fuel Use X #Fuel Oil X Nat. Gas ___ Propane ___ Coal ___ ___ other	3 Burner Setting	4 Blower Pressure	5 Production Rate X Mix Aggregate TPH	5 Production Rate ___ RAP TPH	6 Asphalt Cement %	7 Mix Temp. °F	8 Exhaust Gas Temp. °F	9 X Venturi Scrubber Baghouse Pressure Drop in w.g.	9 Water Pressure psi	10 Ambient Temp. °F	11 Relative Humidity %	12 Exhaust Damper Position
8.10	#2	55	.19	300	0	5.4	285	269	.20	—	80°		40
8.26	#2	58	.19	296	—	5.4	299	272	.2		80°		40
8.43	#2	55	.22	298	—	5.4	295	277	.19		80		40
8.58	#2	54	.22	296	—	5.4	295	271	.19		80°		40
test 4													



CMI drum mixer plant (baghouse)

1. Aggregate bins: Virgin aggregate is fed individually into bins by type. It is metered onto a conveyor belt running under the bins to a shaker screen. The proportion to each aggregate type is determined by the job mix formula and pre-set to be metered out to meet these specifications.

2. Preliminary oversize screen: The aggregate is fed through a shaker screen where oversize rocks and foreign material is screened out of the mix.

3. Weigh conveyor belt: The aggregate is conveyed to the rotary drum dryer on a conveyor belt which weighs the material. The production rate is determined by this weight reading.

4. Rotary drum/dryer mixer: The aggregate is fed into the rotary drum dryer where it is tumbled by flighting into a veil in front of a flame which drives off the moisture. Further mixing is also accomplished in an outer shell of this drum. Hot liquid asphalt is injected in the outer shell of the drum where it is mixed with the aggregate.

5. Burner: The fuel fired burner is used to provide the flame which drys the aggregate.

6. Knock off baffling: A baffling plate is inserted in the "dirty" side plenum as a knock out for heavy particles in the air stream. These particles fall to the bottom of the baghouse.

7. Baghouse: The hot gases are pulled through the bags into the clean air plenum. The solid particulate matter is trapped on the dust coat buildup on the bags. A bag cleaning cycle consisting of jet burst of air from the inside (or clean air side) of the bags sends a large bubble of air down the inside of the bags shaking loose buildup on the bag surface. This particulate matter is collected at the bottom of the baghouse and reinjected into the drum mixer where it is used as part of the finished product.

8. Liquid asphalt storage: The liquid asphalt is stored in this heated tank until it is needed in the mixer. The amount of asphalt content and its temperature are pre-set for each different type job.

9. Conveyor to surge/storage bin: The finished product of aggregate mixed with liquid asphalt is conveyed to a surge bin.

10. Surge/Storage bin: The asphaltic cement is dumped into this surge bin and metered out to dump trucks which pull underneath a slide gate at the bottom of the bin.

11. Control/operators house: The entire plant operation is controlled from this operator's house.

12. Truck loading scale: As the trucks receive the asphalt from the storage/surge bin, they are weighed on the lading scale which tells the plant operator the amount of asphalt that is being trucked on each individual load.

13. Fuel storage.

14. Stack

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.

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.

Form REC#8

SAMPLE ANALYTICAL DATA FORM

Plant Location Hillard Pavina — Relative humidity in lab 45 %

Sample Location Lebanon Missouri — Density of Acetone (pa) .7857 mg/ml

Blank volume (V_a) 100 ml

Date/Time wt. blank 8/12 7:30A — Gross wt. 100.6011 mg

Date/Time wt. blank 8/12 2:00P — Gross wt. 100.6010 mg

Ave. Gross wt. 100.6011 mg

Tare wt. 100.6010 mg

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

Acetone blank residue concentration (C_a) (C_a) = (M_{ab}) / (V_a) (P_a) = (.00000/ mg/g)

Weight of residue in acetone wash: $W_a = C_a V_{aw} P_a$ = (.00000/)(400)(.7857) = (.0003)

		Run # 1	Run # 2	Run # 3
Acetone rinse volume (V_{aw})	ml	400	400	400
Date/Time of wt 8/12 7:30A Gross wt	g	164.3240	162.9422	168.9965
Date/Time of wt 8/12 2:00P Gross wt	g	164.3238	162.9422	168.9963
Average Gross wt	g	164.3239	162.9422	168.9964
Tare wt	g	164.2518	162.8770	168.9596
Less acetone blank wt (W_a)	g	.0003	.0003	.0003
Wt of particulate in acetone rinse (m_a)	g	.0718	.0649	.0365

Filter Numbers	#	TS00854	TS00883	TS00884
Date/Time of wt 8/12 7:30A Gross wt	g	.5458	.6039	.6080
Date/Time of wt 8/12 2:00P Gross wt	g	.5458	.6037	.6078
Average Gross wt	g	.5458	.6038	.6079
Tare wt	g	.5378	.5985	.6020

Weight of particulate on filters(s) (m_f)	g	.0080	.0053	.0059
Weight of particulate in acetone rinse	g	.0718	.0649	.0365
Total weight of particulate (m_n)	g	.0798	.0702	.0424

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 Run 1 & 2 has heavy rust in P.W.

Signature of analyst Thomas South Signature of reviewer

Form REC#8

SAMPLE ANALYTICAL DATA FORM

Plant Location Willard Paving — Relative humidity in lab 45 %

Sample Location Lebanon, MO — Density of Acetone (pa) .7857 mg/ml

Blank volume (V_a) 100 ml

Date/Time wt. blank 8/12 7:30A — Gross wt. 100.6011 mg

Date/Time wt. blank 8/12 2:00P — Gross wt. 100.6010 mg

Ave. Gross wt. 100.6011 mg

Tare wt. 100.6010 mg

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

Acetone blank residue concentration (C_a) (C_a) = (M_{ab}) / (V_a) (p_a) = (.00001 mg/g)

Weight of residue in acetone wash: $W_a = C_a V_{aw} p_a$ = (.00001)(400)(.7857) = (.0003)

		Run # 4	Run # 5	Run #
Acetone rinse volume (V_{aw})	ml	400	400	
Date/Time of wt 8/12 7:30A Gross wt	g	99.8135	102.4393	
Date/Time of wt 8/12 2:00P Gross wt	g	99.8133	102.4393	
Average Gross wt	g	99.8134	102.4393	
Tare wt	g	99.7854	102.4218	
Less acetone blank wt (W_a)	g	.0003	.0003	
Wt of particulate in acetone rinse (m_a)	g	.0277	.0172	
Filter Numbers	#	TS00955	TS16	
Date/Time of wt 8/12 7:30A Gross wt	g	.5808	.5640	
Date/Time of wt 8/12 2:00P Gross wt	g	.5805	.5640	
Average Gross wt	g	.5807	.5640	
Tare wt	g	.5788	.5600	
Weight of particulate on filters(s) (m_f)	g	.0019	.0040	
Weight of particulate in acetone rinse	g	.0277	.0172	
Total weight of particulate (m_n)	g	.0296	.0212	

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

Signature of analyst Thomas South Signature of reviewer

SECTION E:

CALCULATIONS

NAME: Willard Asphalt Paving, Inc.
LOCATION: Lebanon, Missouri

DATE: August 9, 1994

SUMMARY OF TEST DATA

Permit No. 0494-021

			08-09-94 Run #1	08-09-94 Run #2	08-09-94 Run #3	
		start	10:55	14:30	17:30	
		finish	12:33	16:00	19:00	
	SAMPLING TRAIN DATA					*
1.	Sampling time, minutes	Θ	62.50	62.50	62.50	
2.	Sampling nozzle diameter, inches	D_n	0.353	0.353	0.353	
3.	Sampling nozzle cross-section area, ft^2	A_n	0.000680	0.000680	0.000680	
4.	Isokinetic variation	I	108.0	104.1	105.7	10
5.	Sample gas volume — std. condition, ft^3	$V_{m(std)}$	48.113	47.594	48.113	1
6.	Average meter temperature, °R	T_m	563	565	554	
7.	Average orifice pressure drop, inches H_2O	ΔH	2.12	2.04	2.06	
8.	Total Particulate collected, mg.	M_n	79.80	70.20	42.40	
	VELOCITY TRAVERSE DATA					
9.	Stack area, ft^2	A	21.33	21.33	21.33	
10.	Absolute stack gas pressure, inches Hg.	P_s	30.13	30.13	30.13	
11.	Barometric pressure, inches Hg.	P_{bar}	30.13	30.13	30.13	
12.	Average absolute stack temperature, R°	T_s	735	737	730	
13.	Average $\sqrt{}$vel. head, (C_p = .84)	$\sqrt{dP}$	0.48	0.48	0.48	
14.	Average stack gas velocity, ft/second	V_s	33.42	33.31	33.19	7
	STACK MOISTURE CONTENT					
15.	Total water collected by train, ml	V_{ic}	392.00	344.00	361.00	4
16.	Moisture in stack gas, percent (%)	B_{ws}	27.77	25.39	26.11	5
	STACK MOLECULAR WEIGHT					
17.	Percent CO_2 by volume	CO_2	3.3	3.3	3.3	
18.	Percent O_2 by volume	O_2	11.7	11.3	11.7	
19.	Percent CO by volume	CO	0.0	0.0	0.0	
20.	Percent N_2 by volume	N_2	85.0	85.3	85.0	
21.	Dry molecular weight, lb/lb-mole	M_d	29.00	28.99	29.00	3
22.	Stack molecular weight, lb/lb-mole	M_s	25.95	26.20	26.13	6
	EMISSIONS DATA					
23.	Stack gas flow rate, dscf/hr	Q_{sd}	1,341,125.2	1,377,009.1	1,371,837.5	8
24.	Stack gas flow rate, cfm	acfm	42,778	42,637	42,483	
25.	Particulate concentration, gr/dscf	C_s	0.0255	0.0227	0.0136	2
26.	Particulate concentration, lb/hr	E	4.89	4.47	2.66	9

*see Calculation No. on following pages

NAME: Willard Asphalt Paving, Inc.
LOCATION: Lebanon, Missouri

DATE: August 10, 1994

SUMMARY OF TEST DATA

	Permit No. 0494-021		08-10-94 Run #4	08-10-94 Run #5	
		start	08:10	10:17	
		finish	09:35	12:05	
	SAMPLING TRAIN DATA				*
1.	Sampling time, minutes	Θ	62.50	62.50	
2.	Sampling nozzle diameter, inches	D_n	0.353	0.353	
3.	Sampling nozzle cross-section area, ft^2	A_n	0.000680	0.000680	
4.	Isokinetic variation	I	101.3	102.0	10
5.	Sample gas volume — std. condition, ft^3	$V_{m(std)}$	45.760	46.791	1
6.	Average meter temperature, °R	T_m	554	561	
7.	Average orifice pressure drop, inches H_2O	ΔH	1.87	1.90	
8.	Total Particulate collected, mg.	M_n	29.60	21.20	
	VELOCITY TRAVERSE DATA				
9.	Stack area, ft^2	A	21.33	21.33	
10.	Absolute stack gas pressure, inches Hg.	P_s	30.20	30.20	
11.	Barometric pressure, inches Hg.	P_{bar}	30.20	30.20	
12.	Average absolute stack temperature, R°	T_s	721	712	
13.	Average $\sqrt{}$vel. head, (C_p = .84)	$\sqrt{dP}$	0.47	0.47	
14.	Average stack gas velocity, ft/second	V_s	31.99	31.81	7
	STACK MOISTURE CONTENT				
15.	Total water collected by train, ml	V_{ic}	325.00	321.00	4
16.	Moisture in stack gas, percent (%)	B_{ws}	25.06	24.40	5
	STACK MOLECULAR WEIGHT				
17.	Percent CO_2 by volume	CO_2	6.8	6.5	
18.	Percent O_2 by volume	O_2	9.3	6.8	
19.	Percent CO by volume	CO	0.0	0.0	
20.	Percent N_2 by volume	N_2	84.0	86.8	
21.	Dry molecular weight, lb/lb-mole	M_d	29.45	29.31	3
22.	Stack molecular weight, lb/lb-mole	M_s	26.58	26.55	6
	EMISSIONS DATA				
23.	Stack gas flow rate, dscf/hr	Q_{sd}	1,360,921.6	1,382,438.8	8
24.	Stack gas flow rate, cfm	acfm	40,947	40,717	
25.	Particulate concentration, gr/dscf	C_s	0.0100	0.0070	2
26.	Particulate concentration, lb/hr	E	1.94	1.38	9

1. Dry Gas Volume

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

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

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

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]^{½}
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

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

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

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

Where:

- I = Percent isokinetic sampling.
- 100 = Conversion to percent.
- T_s = Absolute average stack gas temperature, °R.
- 0.002669 = Conversion factor, Hg - ft³/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, ft².
- Y_i = Calibration factor.

SECTION F:

FIELD DATA

9.3 [illegible] Environmental Corporation

Plant Willard Asphalt
Location Lebanon MO
Operator L EVANS
Date 8-9-94
Run No. 1
Sample Box No. 1
Meter Box No. NG-Tech 2
Meter H @ 1.921
C Factor .946
Pitot Tube Coefficient Cp .84

Schematic of Stack Cross Section

Ambient Temperature 89
Barometric Pressure 30.13
Assumed Moisture, % 20
Probe Length, m (ft) 6
Probe Heater Setting 20
Nozzle Identification No. .0006796
Avg. Calibrated Nozzle Dia., (in.) .353/.353/.353
Leak Rate, m³/min. (cfm) .015 AT 10 in
Static Pressure, mm Hg (in. Hg) .001 IN
Filter No. 1500454

	Impinger Volume, ml	Silica Gel Weight, g
Final	582	856
Initial	200	846
Difference	382	10

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	1055 / 1057.5	5	257	.32	2.9	675.644 / 678.6	105	103	246	62
2	1100	5	263	.29	2.6	680.0	106	104	248	61
3	1102.5	5	271	.34	3.1	682.3	108	104	239	62
4	1105	5	274	.27	2.5	684.6	109	104	250	60
5	1107.5	4	277	.18	1.6	686.9	110	105	249	58
1	1115 / 1117.5	3	275	.18	1.6	688.6	102	99	242	61
2	1120	3	276	.16	1.5	690.4	104	101	242	60
3	1122.5	3	276	.20	1.8	692.1	101	98	241	58
4	1125	4	279	.22	2.0	694.0	105	102	244	57
5	1127.5	4	271	.21	1.9	696.3	106	102	244	56
1	1137.5 / 1140	4	285	.23	2.1	698.0	104	101	245	58
2	1142.5	4	286	.21	1.9	700.0	104	102	245	58
3	1145	4	285	.20	1.8	702.0	103	100	247	58
4	1147.5	6	284	.33	3.0	704.8	101	98	241	58
5	1150	6	282	.35	3.2	707.2	103	99	244	57

RAMCON emissions test log sheet, cont. Date 8.9.94 Location _____ Test No. 1

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, ft^3	Gas Sample Temperature at Dry Gas Meter °F		Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
							Inlet	Outlet		
1	1157.5 / 1200	4	279	.22	2.0	708.8	102	99	250	[redacted]61
2	1202.5	4	278	.22	2.0	711.0	103	101	246	60
3	1205	5	278	.24	2.2	713.0	103	100	244	59
4	1207.5	4	274	.19	1.7	715.1	102	99	241	58
5	1210	4	275	.19	1.7	717.1	103	100	242	58
1	1220 / 1222.5	5	261	.22	2.0	718.8	106	102	245	59
2	1225	4	266	.20	1.8	720.8	105	103	244	59
3	1227.5	4	271	.19	1.7	722.6	108	104	245	58
4	1230	5	271	.23	2.1	724.8	107	103	246	58
5	1232.5	5	274	.24	2.2	727.067	108	104	245	58

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...MCC... Environmental Corporat...

Plant Wilard Asphalt
Location Lebanon MO
Operator L Evans
Date 8-9-24
Run No. 2
Sample Box No. 1
Meter Box No. Nagel 2
Meter H @ 1.921
C Factor .986
Pitot Tube Coefficient Cp .84

Schematic of Stack Cross Section

Ambient Temperature 98
Barometric Pressure 30.13
Assumed Moisture, % 25
Probe Length, m (ft) 6
Probe Heater Setting 60
Nozzle Identification No. .0006796
Avg. Calibrated Nozzle Dia., (in.) .353/.353/.353
Leak Rate, m³/min. (cfm) .008 at 7 in
Static Pressure, mm Hg (in. Hg) .002 in
Filter No. TS00823

	Impinger Volume, ml	Silica Gel Weight, g
Final	537	863
Initial	200	856
Difference	337	7

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		Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
							Inlet	Outlet		
1	2:30 / 2:32.5	3	319	.22	1.9	727.816 / 729.6	110	110	261	65
2	2:35	3	286	.22	1.9	731.4	111	110	266	65
3	2:37.5	3	279	.21	1.8	733.8	113	112	258	64
4	2:40	3	269	.25	2.2	736.1	112	110	255	61
5	2:42.5	3	270	.25	2.2	738.0	107	107	252	61
1	2:47.5 / 2:50	3	270	.2	1.8	739.8	108	107	262	60
2	2:52.5	3	276	.18	1.6	741.7	108	110	248	61
3	2:55	3	277	.2	1.8	743.9	111	111	242	60
4	2:57.5	3	275	.22	1.9	745.5	111	110	242	59
5	3:00	3	275	.25	2.2	747.5	111	110	244	59
1	3:07.5 / 3:10	3	276	.22	1.9	749.6	111	109	245	60
2	3:12.5	4	278	.25	2.2	751.7	112	112	241	61
3	3:15	4	280	.23	2	753.7	113	112	245	61
4	3:17.5	4	276	.25	2.2	756.0	114	112	246	60
5	3:20	4	280	.24	2.1	757.9	114	112	241	60

RAMCON emissions test log sheet, cont. Date 8-9-94 Location Ledvance MO 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, ft^3	Gas Sample Temperature at Dry Gas Meter °F		Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
							Inlet	Outlet		
1	3:25 / 3:27.5	5	276	.29	2.6	760.2	103	103	240	62
2	3:30	5	275	.27	2.4	762.4	102	105	242	60
3	3:32.5	5	274	.25	2.2	764.6	102	103	244	59
4	3:35	5	270	.29	2.6	766.9	97	100	240	59
5	3:37.5	5	274	.28	2.5	769.3	96	98	246	59
1	3:47.5 / 3:50	5	273	.20	1.8	771.2	90	91	246	61
2	3:52.5	4	276	.21	1.9	773.2	91	92	246	62
3	3:55	4	275	.23	2	775.1	90	91	239	61
4	3:57.5	4	274	.19	1.7	776.9	91	91	241	62
5	4:00	4	269	.17	1.5	778.869	92	91	242	63

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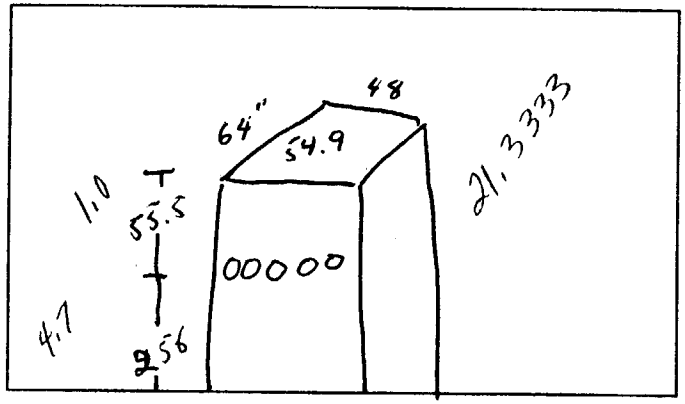
9

RAMCON Environmental Corporation

Plant Willard asphalt
Location Lebanon
Operator L Evans
Date 8-9-94
Run No. 3
Sample Box No. 1
Meter Box No. NA Test 2
Meter H @ 1.921
C Factor .986
Pitot Tube Coefficient Cp .84



Schematic of Stack Cross Section

Ambient Temperature 88
Barometric Pressure 30.13
Assumed Moisture, % 25
Probe Length, m (ft) 6
Probe Heater Setting 20
Nozzle Identification No. .0006796
Avg. Calibrated Nozzle Dia., (in.) .353/.353/.353
Leak Rate, m³/min. (cfm) .012 AT 10 IN
Static Pressure, mm Hg (in. Hg) .05 IN
Filter No. T500884

	Impinger Volume, ml	Silica Gel Weight, g
Final	554	880
Initial	200	863
Difference	354	7

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		Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
							Inlet	Outlet		
1	5:30 / 5:32.5	5	265	.3.2	2.8	779.779 / 781.8	90	90	244	64
2	5:35	5	266	.31	2.7	784.1	92	90	246	61
3	5:37.5	4	258	.28	2.5	786.6	93	89	245	62
4	5:40	4	257	.27	2.4	788.5	93	87	245	62
5	5:42.5	4	254	.23	2	790.8	95	90	245	63
1	5:47.5 / 5:50	4	265	.24	2.0	792.5	92	90	248	61
2	5:52.5	4	271	.26	2.3	795.0	96	91	247	60
3	5:55	4	273	.23	2	797.0	97	91	245	61
4	5:57.5	4	274	.23	2	798.4	100	92	242	62
5	6:00	4	272	.22	1.9	801.0	101	93	244	62
1	6:10 / 6:12.5	3	271	.18	1.6	802.6	95	94	247	63
2	6:15	3	272	.19	1.7	804.4	98	94	245	61
3	6:17.5	4	271	.22	1.9	806.5	99	94	245	62
4	6:20	5	271	.26	2.4	808.8	99	94	242	63
5	6:22.5	4	262	.2	1.8	810.7	100	94	240	62

RAMCON emissions test log sheet, cont. Date 8-9-94 Location Lebanon MO. Test No. 3

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, ft^3	Gas Sample Temperature at Dry Gas Meter °F		Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
							Inlet	Outlet		
1	6:27.5 / 6:30	4	275	.25	2.2	812.8	96	93	244	62
2	6:32.5	3	277	.22	1.9	814.6	97	93	245	62
3	6:35	3	277	.22	1.9	816.4	97	93	245	61
4	6:37.5	4	278	.26	2.3	818.7	98	93	245	62
5	6:40	4	274	.22	1.9	820.9	99	93	245	63
1	6:47.5 / 6:50	4	275	.21	1.9	822.6	93	92	247	64
2	6:52.5	3	275	.19	1.7	824.7	94	92	246	63
3	6:55	3	276	.19	1.7	826.4	95	92	245	62
4	6:57.5	4	275	.22	1.9	828.4	96	92	244	61
5	7:00	4	275	.22	1.9	830.386	97	92	245	61

RAMCON Environmental Corporation

Plant Willard Paving
Location LEBANON MO
Operator L EVANS
Date 8.10-94
Run No. 4
Sample Box No. 1
Meter Box No. NU Tc-1 2
Meter H@ 1.921
C Factor .986
Pitot Tube Coefficient Cp .84

8.6

Schematic of Stack Cross Section

Ambient Temperature 74
Barometric Pressure 30.20
Assumed Moisture, % 25
Probe Length, m (ft) 6
Probe Heater Setting 40
Nozzle Identification No. 0006796
Avg. Calibrated Nozzle Dia., (in.) .353/.353/.353
Leak Rate, m³/min. (cfm) .012 @ 10
Static Pressure, mm Hg (in. Hg) .002 in
Filter No. TS 00955

	Impinger Volume, ml	Silica Gel Weight, g
Final	514	899
Initial	200	888
Difference	314	11

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	8:10 / 812.5	3	265	.2	1.7	832.641 / 833.9	84	82	245	64
2	8:15	3	264	.18	1.5	835.4	84	82	245	62
3	8:17.5	3	260	.22	1.8	837.7	86	83	245	60
4	8:20	5	258	.31	2.6	839.6	88	83	246	59
5	8:22.5	5	261	.34	2.9	842.3	91	94	247	58
1	8:27.5 / 8:30	3	260	.15	1.2	843.9	88	86	247	63
2	8:32.5	3	260	.15	1.2	845.5	92	87	246	61
3	8:35	3	258	.18	1.5	847.1	94	88	246	58
4	8:37.5	4	260	.21	1.8	849.2	95	89	245	57
5	8:40	4	255	.22	1.8	851.2	97	89	247	57
1	8:47.5 / 8:50	5	265	.31	2.6	853.2	97	92	247	61
2	8:52.5	5	263	.28	2.4	855.5	97	92	246	66
3	8:55	5	264	.3	2.5	257.5	98	92	245	58
4	8:57.5	5	263	.28	2.4	860.1	99	93	244	57
5	9:00	4	261	.24	2	862.2	101	94	245	57

RAMCON emissions test log sheet, cont. Date 8-10-94 Location Lebanon Test No. 4

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, ft^3	Gas Sample Temperature at Dry Gas Meter °F		Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
							Inlet	Outlet		
1	9:05 9:07.5	2	260	.1	.86	863.5	99	95	247	61
2	9:10	4	259	.2	1.7	865.4	100	95	245	58
3	9:12.5	4	258	.18	1.5	867.0	102	96	246	57
4	9:15	4	259	.25	2.1	868.8	103	97	240	58
5	9:17.5	4	259	.20	1.7	871.0	104	97	242	59
1	9:22.5 9:25	4	260	.18	1.5	872.7	102	98	251	61
2	9:27.5	3	262	.12	1	874.2	103	99	246	62
3	9:30	4	261	.19	1.6	875.8	104	99	244	63
4	9:32.5	5	260	.28	2.4	878.2	106	100	243	63
5	9:35	5	259	.3	2.5	880.685	107	100	245	62

Plant Willard Paving
Location Lebanon MO
Operator L Evans
Date 8-10-94
Run No. 5
Sample Box No. 1
Meter Box No. NO Trak 2
Meter H @ 1.921
C Factor .986
Pitot Tube Coefficient Cp .84

Schematic of Stack Cross Section

Ambient Temperature 88
Barometric Pressure 30.20
Assumed Moisture, % 25
Probe Length, m (ft) 6
Probe Heater Setting LO
Nozzle Identification No. .0006796
Avg. Calibrated Nozzle Dia., (in.) .353/.353/.353
Leak Rate, m³/min. (cfm) .014 AT 10 IN
Static Pressure, mm Hg (in. Hg) .01 IN
Filter No. TS 16

	Impinger Volume, ml	Silica Gel Weight, g
Final	514	906
Initial	200	899
Difference	314	7

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	10:47.5 / 10:50	4	258	.25	2.1	882.810 / 884.5	104	104	246	64
2	10:52.5	3	254	.21	1.8	886.6	105	105	247	61
3	10:55	3	250	.23	1.9	888.4	106	105	245	60
4	10:57.5	3	244	.24	2	890.7	108	105	245	59
5	11:00	3	243	.24	2	892.7	99	99	245	57
1	11:05 / 11:07.5	3	247	.24	2	894.5	98	98	246	62
2	11:10	3	254	.18	1.5	896.5	99	99	245	60
3	11:12.5	3	252	.2	1.7	898.1	99	99	250	58
4	11:15	3	251	.23	1.9	899.9	100	99	251	58
5	11:17.5	3	251	.23	1.9	902.2	100	99	251	57
1	11:20 / 11:22.5	4	248	.28	2.4	904.3	98	98	250	59
2	11:25	4	253	.27	2.3	906.6	100	99	251	58
3	11:27.5	4	257	.28	2.4	908.7	102	99	248	58
4	11:30	4	256	.23	1.9	910.5	101	99	248	57
5	11:32.5	4	254	.23	1.9	912.7	102	99	246	57

RAMCON emissions test log sheet, cont. Date 8-20-94 Location Lebanon Test No. 5

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, ft^3	Gas Sample Temperature at Dry Gas Meter °F		Filter Holder Temperature °F	Gas Temp. Lvg Condenser or Last Impinger °F
							Inlet	Outlet		
1	11:35 / 11:37.5	4	248	.2	1.7	914.4	101	99	244	60
2	11:40	4	257	.2	1.7	916.3	101	99	241	58
3	11:42.5	4	257	.28	2.4	918.3	102	99	240	58
4	11:45	5	256	.22	1.8	921.0	103	100	244	57
5	11:47.5	5	252	.2	1.7	923.4	104	101	243	56
1	11:52.5 / 11:55	4	252	.21	1.8	925.1	100	100	243	58
2	11:57.5	4	253	.18	1.5	927.0	101	100	241	58
3	12:00	4	253	.18	1.5	928.5	100	99	246	57
4	12:02.5	4	253	.2	1.7	930.5	100	99	242	57
5	12:05	4	251	.24	2	932.554	101	100	242	58

Willard Paving
Company Name

8-9-94
Date

REFERENCE METHOD 3: GAS ANALYSIS BY FYRITE

FUEL	F_o FACTORS
WOOD	1.0540
BARK	1.0830
ANTHRACITE	1.0699
BITUMINOUS	1.1398
LIGNITE	1.0761
OIL	1.3465
GAS	1.7489
PROPANE	1.5095
BUTANE	1.4791

$O_2\% = 20.9 - [F_o \times CO_2\%]$

RUN #1: ____ = 20.9 - [____ x ____]

RUN #2: ____ = 20.9 - [____ x ____]

RUN #3 ____ = 20.9 - [____ x ____]

RUN 1:	$CO_{2\%}$	3	$CO_{2\%}$	3	$CO_{2\%}$	4	AVG.	3.33
	$O_{2\%}$	12	$O_{2\%}$	11	$O_{2\%}$	12	AVG.	11.66
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	
RUN 2:	$CO_{2\%}$	3.5	$CO_{2\%}$	3	$CO_{2\%}$	3.5	AVG.	3.33
	$O_{2\%}$	11	$O_{2\%}$	12	$O_{2\%}$	11	AVG.	11.33
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	
RUN 3:	$CO_{2\%}$	3	$CO_{2\%}$	3.5	$CO_{2\%}$	3.5	AVG.	3.33
	$O_{2\%}$	12	$O_{2\%}$	11	$O_{2\%}$	11	AVG.	11.66
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	

Willard Paving
Company Name

8-10-94
Date

REFERENCE METHOD 3: GAS ANALYSIS BY FYRITE

FUEL	F_o FACTORS
WOOD	1.0540
BARK	1.0830
ANTHRACITE	1.0699
BITUMINOUS	1.1398
LIGNITE	1.0761
OIL	1.3465
GAS	1.7489
PROPANE	1.5095
BUTANE	1.4791

$O_2\% = 20.9 - [F_o \times CO_2\%]$

RUN #1: ____ = 20.9 - [____ x ____]

RUN #2: ____ = 20.9 - [____ x ____]

RUN #3 ____ = 20.9 - [____ x ____]

RUN 1:	$CO_{2\%}$	6.5	$CO_{2\%}$	7	$CO_{2\%}$	7.5	AVG.	7
	$O_{2\%}$	10	$O_{2\%}$	8.5	$O_{2\%}$	7.5	AVG.	8.66
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	
RUN 2:	$CO_{2\%}$	7	$CO_{2\%}$	6	$CO_{2\%}$	7.5	AVG.	6.83
	$O_{2\%}$	7	$O_{2\%}$	6.5	$O_{2\%}$	8	AVG.	7.16
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	
RUN 3:	$CO_{2\%}$		$CO_{2\%}$		$CO_{2\%}$		AVG.	
	$O_{2\%}$		$O_{2\%}$		$O_{2\%}$		AVG.	
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	

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 γ = .05 cm (in.); <0.32 cm (<1/8 in.),
w = A sin θ = .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

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 γ = .05 cm (in.); <0.32 cm (<1/8 in.),

w = A sin θ = .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

te 2-26-93 Thermocouple number 81

Ambient temperature 70°F °C Barometric pressure 30.24 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	35	36	.2
B	Boiling Water	212	216	.3
C	Hot Oil	540	547	.7

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

[b]Type of calibration system used.

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

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English Units)

Test No. _____ Date 9/15/94 Meter Box No. Nutech #2 Plant No. _____

Barometric Pressure P_b = 30.25 in.Hg Dry Gas Meter No. _____ 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	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
.5	5	933.367 / 938.447	81	85 / 86	82 / 83	84	12.4	2	.989	1.734
1.0	5	938.692 / 943.714	81	86 / 89	83 / 84	85.5	9.0	2	1.001	1.823
2.0	10	943.990 / 953.880	91	90 / 93	84 / 86	88.25	13.0	2	1.019	1.891
									Y = 1.003	1.916

† 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 No. _____ Date 7/21/94 Meter Box No. Nutech #2 Plant No. _____

Barometric Pressure P_b = 29.95 in.Hg Dry Gas Meter No. _____ Pretest Y .983

	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	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
10:37	1	10	394.300 / 404.677	87.0	104 / 106	98 / 100	102.0	17.90	3	.988	
10:52	2	10	383.124 / 393.746	87.5	102 / 106	97 / 98	100.8	13.08	2	.987	1.93
10:31	3	10	372.800 / 383.113	87.5	100 / 105	95 / 96	99.8	10.53	3	.983	1.88
										Y =	$\Delta H_@$ =

† 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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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: Leon Evans
Title: Team Leader

Qualifications: Mr. Evans is currently serving RAMCON Environmental Corporation as an Isokinetic Team Leader. He is proficient in all sampling procedures employing this type of testing. He is currently certified in conducting US EPA Reference Method 9 for opacity.

Project Duties: Mr. Evans is responsible for conducting isokinetic sampling procedures at the facility. He is also responsible for preparation and calibration of the necessary equipment for the project. His duties on-site include assembling the sample train, operation of the sampling equipment, sample recovery, and quality assurance/quality control checks.

Historical Data: Mr. Evans served ten (10) years in the U. S. Army, achieving the rank of Staff Sergeant serving as a nuclear, biological and chemical operations specialist. He was awarded the Bronze Star medal for action in Operation Desert Storm and currently serves as a member of the Tennessee National Guard Military Police. Prior to his military experience, Mr. Evans attended Central Texas College for two (2) years with a major in law enforcement.

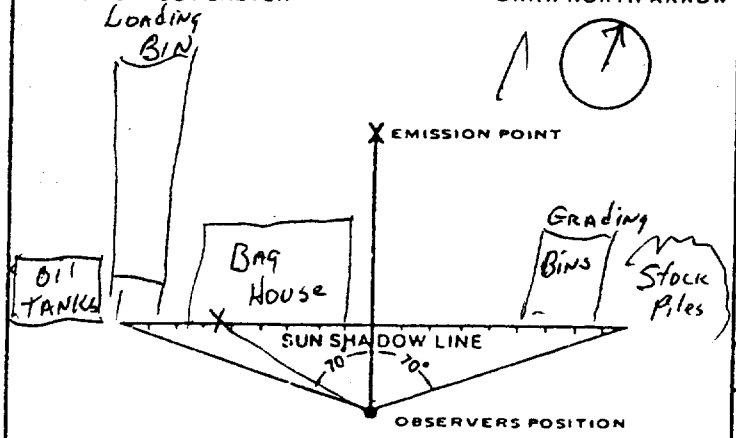
SECTION I:

VISIBLE EMISSIONS

RUN #1

SOURCE NAME: Willard Asphalt + Paving Inc	OBSERVATION DATE: Aug 9, 1994	START TIME: 11:00 AM	STOP TIME: 12:00 PM
ADDRESS: Rt. 5 - Box 274			
CITY: Lebanon	STATE: Mo	ZIP: 65536	
PHONE: 417/532-7107	SOURCE ID NUMBER:		
PROCESS EQUIPMENT: Asphalt Plant	OPERATING MODE:		
CONTROL EQUIPMENT: Bag house	OPERATING MODE:		
DESCRIBE EMISSION POINT: Metal Stack (Square)			
HEIGHT ABOVE GROUND LEVEL: 38.1'	HEIGHT RELATIVE TO OBSERVER: 41'		
DISTANCE FROM OBSERVER: 102 Ft	DIRECTION FROM OBSERVER: NNW		
DESCRIBE EMISSIONS: Lofting Plume			
EMISSION COLOR: Silver Grey	PLUME TYPE: CONTINUOUS [X] FUGITIVE [ ] INTERMITTENT [ ]		
WATER DROPLETS PRESENT: NO [X] YES [ ]	IS WATER DROPLET PLUME: ATTACHED [ ] DETACHED [X]		
AT WHAT POINT IN THE PLUME WAS OPACITY DETERMINED: Stack Outlet			
DESCRIBE BACKGROUND: Sky			
BACKGROUND COLOR: Blue	SKY CONDITIONS: Clear		
WIND SPEED: 10-12 mph	WIND DIRECTION: S		
AMBIENT TEMPERATURE:	RELATIVE HUMIDITY: 85%		

SOURCE LAYOUT SKETCH



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

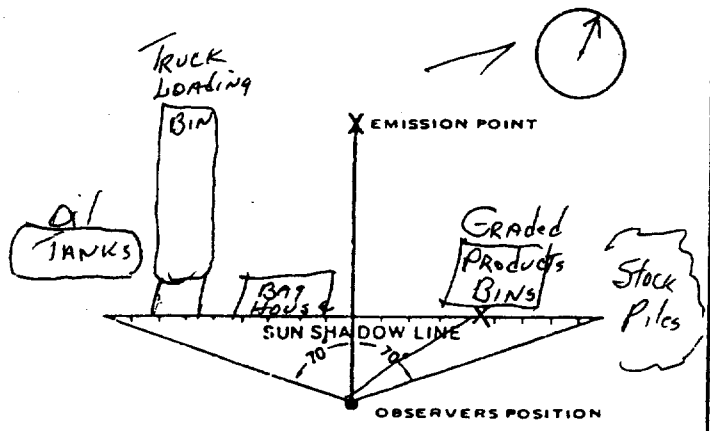
AVERAGE OPACITY FOR HIGHEST PERIOD: 1.04 %	NUMBER OF READINGS ABOVE 1.04 % WERE 5
COMMENTS: Sunglasses Worn	RANGE OF OPACITY READINGS: MINIMUM 0 MAXIMUM 5
	OBSERVER'S NAME (PRINT): E.T. Crook
	OBSERVER'S SIGNATURE: E.T. Crook — DATE: Nov 22, 1994
	ORGANIZATION
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS — SIGNATURE	CERTIFIED BY — DATE
TITLE — DATE	VERIFIED BY — DATE

REC#14

RUN # 2

SOURCE NAME	Willard Asphalt + Paving Inc
ADDRESS	Rt. 5 - Box 274
CITY	Lebanon
STATE	Mo
ZIP	65536
PHONE	417/532-7107
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Asphalt Plant
OPERATING MODE	
CONTROL EQUIPMENT	Baghouse
OPERATING MODE	
DESCRIBE EMISSION POINT	Square Metal Stack
HEIGHT ABOVE GROUND LEVEL	38.1'
HEIGHT RELATIVE TO OBSERVER	41 FT.
DISTANCE FROM OBSERVER	102 FT
DIRECTION FROM OBSERVER	NNW
DESCRIBE EMISSIONS	Lofting Plume
EMISSION COLOR	Silver Grey
PLUME TYPE: CONTINUOUS [X] FUGITIVE [ ] INTERMITTENT [ ]	
WATER DROPLETS PRESENT NO [X] YES [ ]	
IS WATER DROPLET PLUME ATTACHED [ ] DETACHED [X]	
AT WHAT POINT IN THE PLUME WAS OPACITY DETERMINED	Stack Outlet
DESCRIBE BACKGROUND	Clouds + Sky
BACKGROUND COLOR	Stone Gray + Blue
SKY CONDITIONS	Partly Cloudy 50%
WIND SPEED	8-10 mph
WIND DIRECTION	SW
AMBIENT TEMPERATURE	
RELATIVE HUMIDITY	

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



OBSERVATION DATE	START TIME	STOP TIME
Aug 9, 1994	2:35 PM	3:35 PM

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

AVERAGE OPACITY FOR HIGHEST PERIOD	1.25 %
NUMBER OF READINGS ABOVE 1.25 % WERE	6
RANGE OF OPACITY READINGS MINIMUM	0
MAXIMUM	5
COMMENTS	Sunglasses Worn
OBSERVER'S NAME (PRINT)	E T Crook
OBSERVER'S SIGNATURE	E. T. Crook
DATE	Nov 22, 94
ORGANIZATION	
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TITLE	
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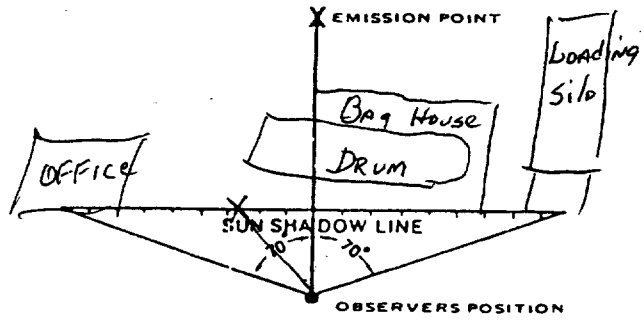
CERTIFIED BY	
DATE	
VERIFIED BY	
DATE	

REC#14

RUN #3

SOURCE NAME	Willard Asphalt & Paving Inc
ADDRESS	Rt. 5 - Box 274
CITY	Lebanon
STATE	Mo
ZIP	65536
PHONE	417/532-7107
SOURCE ID NUMBER	
PROCESS EQUIPMENT	Asphalt Plant
OPERATING MODE	
CONTROL EQUIPMENT	Bag house
OPERATING MODE	
DESCRIBE EMISSION POINT	Square Metal Stack
HEIGHT ABOVE GROUND LEVEL	38.1 FT
HEIGHT RELATIVE TO OBSERVER	38 FT
DISTANCE FROM OBSERVER	
DIRECTION FROM OBSERVER	SE
DESCRIBE EMISSIONS	Lofting Plume
EMISSION COLOR	Silver Gray
PLUME TYPE: CONTINUOUS [X] FUGITIVE [ ] INTERMITTENT [ ]	
WATER DROPLETS PRESENT NO [X] YES [ ]	
IS WATER DROPLET PLUME ATTACHED [ ] DETACHED [X]	
AT WHAT POINT IN THE PLUME WAS OPACITY DETERMINED	Stack Outlet
DESCRIBE BACKGROUND	Clouds
BACKGROUND COLOR	Stone Gray
SKY CONDITIONS	Overcast Clouds
WIND SPEED	6-8 mph
WIND DIRECTION	S
AMBIENT TEMPERATURE	
RELATIVE HUMIDITY	

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



OBSERVATION DATE: Aug 9, 1994 | START TIME: 5:35 PM | STOP TIME: 6:35 PM

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

AVERAGE OPACITY FOR HIGHEST PERIOD: .83%

NUMBER OF READINGS ABOVE .83 % WERE 4

RANGE OF OPACITY READINGS: MINIMUM 0 MAXIMUM 5

COMMENTS: Sunglasses Worn

OBSERVER'S NAME (PRINT): E. T. Crook

OBSERVER'S SIGNATURE: E. T. Crook — DATE: Nov 22, 1994

ORGANIZATION:

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SIGNATURE:

TITLE: DATE:

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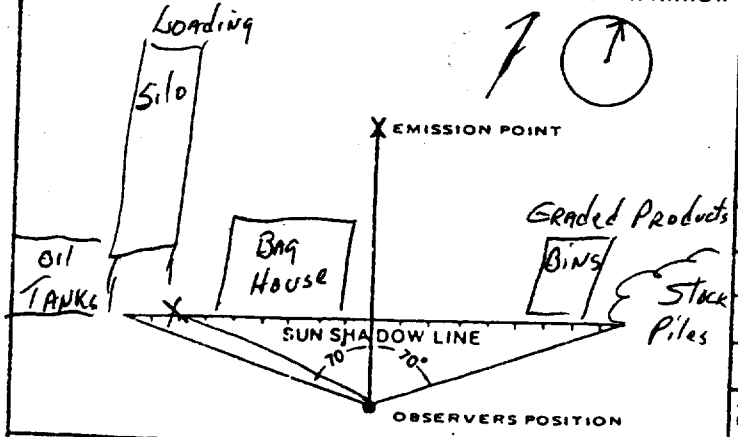
VERIFIED BY: DATE:

REC#14

RUN #4

SOURCE NAME: Willard Asphalt & Paving Inc
ADDRESS: Rt. 5 - Box 274
CITY: Lebanon | STATE: Mo | ZIP: 65536
PHONE: 417/532-7107 | SOURCE ID NUMBER:
PROCESS EQUIPMENT: Asphalt Plant | OPERATING MODE:
CONTROL EQUIPMENT: Baghouse | OPERATING MODE:
DESCRIBE EMISSION POINT: Square Metal Stack
HEIGHT ABOVE GROUND LEVEL: 38.1 FT | HEIGHT RELATIVE TO OBSERVER: 41 FT
DISTANCE FROM OBSERVER: 102 FT | DIRECTION FROM OBSERVER: NNW
DESCRIBE EMISSIONS: Loading Plume
EMISSION COLOR: Silver Grey | PLUME TYPE: CONTINUOUS [X] FUGITIVE [ ] INTERMITTENT [ ]
WATER DROPLETS PRESENT: NO [X] YES [ ] | IS WATER DROPLET PLUME ATTACHED [ ] DETACHED [X]
AT WHAT POINT IN THE PLUME WAS OPACITY DETERMINED: Stack Outlet
DESCRIBE BACKGROUND: Sky
BACKGROUND COLOR: Blue-Gray | SKY CONDITIONS: Partly Cloudy 25%
WIND SPEED: 3-5 mph | WIND DIRECTION: S
AMBIENT TEMPERATURE: | RELATIVE HUMIDITY: 87%

SOURCE LAYOUT SKETCH



OBSERVATION DATE	START TIME	STOP TIME
Aug 10, 1994	8:15 AM	9:15 AM

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

AVERAGE OPACITY FOR HIGHEST PERIOD: .96%
NUMBER OF READINGS ABOVE .96 % WERE: 5
RANGE OF OPACITY READINGS: MINIMUM 0 MAXIMUM 5
OBSERVER'S NAME (PRINT): E. T. CROOK
OBSERVER'S SIGNATURE: E. T. Crook | DATE: Nov 22, 1994
ORGANIZATION:

COMMENTS: Sunglasses Worn

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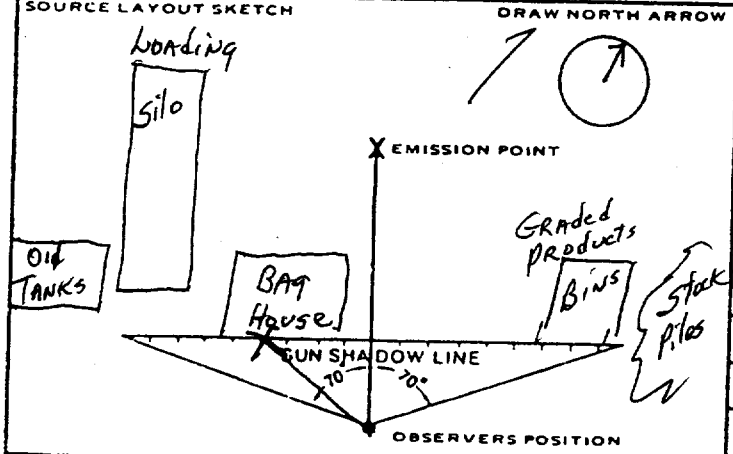
REC#14

RUN #5

SOURCE NAME: Willard Asphalt + Paving Inc
ADDRESS: Rt. 5 - Box 274
CITY: Lebanon | STATE: Mo | ZIP: 65536
PHONE: 417/532-7107 | SOURCE ID NUMBER:
PROCESS EQUIPMENT: Asphalt Plant | OPERATING MODE:
CONTROL EQUIPMENT: Baghouse | OPERATING MODE:
DESCRIBE EMISSION POINT: Square Metal Stack
HEIGHT ABOVE GROUND LEVEL: 38.1 FT | HEIGHT RELATIVE TO OBSERVER: 41 FT
DISTANCE FROM OBSERVER: 102 FT | DIRECTION FROM OBSERVER: NNW
DESCRIBE EMISSIONS: Roofing Plume
EMISSION COLOR: Silver Grey | PLUME TYPE: CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT: NO ☒ YES ☐ | IS WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☒
AT WHAT POINT IN THE PLUME WAS OPACITY DETERMINED: Stack Outlet
DESCRIBE BACKGROUND: Sky
BACKGROUND COLOR: Blue | SKY CONDITIONS: Partly Cloudy 10%
WIND SPEED: 5-7 mph | WIND DIRECTION: S
AMBIENT TEMPERATURE: | RELATIVE HUMIDITY: 87%

SOURCE LAYOUT SKETCH



OBSERVATION DATE	START TIME	STOP TIME
Aug 10, 1994	10:50 AM	11:50 AM

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

AVERAGE OPACITY FOR HIGHEST PERIOD: 1.04 %
NUMBER OF READINGS ABOVE 1.04 % WERE: 5
RANGE OF OPACITY READINGS: MINIMUM 0 MAXIMUM 5

COMMENTS: Sunglasses Worn
Wind increased to 20 mph at 11:15 AM

OBSERVER'S NAME (PRINT): E.T. Crook
OBSERVER'S SIGNATURE: E.T. Crook | DATE: Nov 22, 1994
ORGANIZATION:

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VERIFIED BY | DATE

REC#14

CARL KOONTZ ASSOCIATES

of Nashville, Tennessee

This is to acknowledge that

E. T. Crook

successfully participated in Visible Emissions training on May 23, 1994 and is qualified to evaluate Visible Emissions for a period of six (6) months from the date of certification.

Carl Koontz

Instructor

PLANT NAME: Millard Asphalt Paving (TEST UNIT: CMT portable drum mix)
LOCATION: Lebanon DATE: 8/9/96 RUN NO: 3

USE FOR ANY TEST WITH A SQUARE OR RECTANGULAR STACK

NUMBER OF POINTS	25	PERCENT OXYGEN	11.70
TIME, MINUTE POINT	2.50	PERCENT CARBON DIOXIDE	3.30
LEAK RATE, FTS/MIN	0.012	PERCENT CARBON MONOXIDE	0.00
BAR PRESS, INCH Hg	30.13	Cp (PITOT COEFFICIENT)	0.84
STATIC PRESS (in H2O)	0.00	NOZZLE DIAMETER, INCHES	0.353
STACK EXIT LENGTH IN	64.00	INITIAL METER VOL, FT3	779.779
STACK EXIT WIDTH IN	48.00	FINAL METER VOL, FT3	820.386
IMPINGER H2O, ML	554.0	METER CORR FACT, Y	0.985
SILICA GEL H2O, GM	7.0	PARTIC COLLECTED, MG	42.40

PT NO	STACK TEMP (Ts)	VELOC PRESS (dP=)	ORIFICE PRESS (dH)	METER TEMP INLET (Tm)	METER TEMP OUTLET (Tm)	SQR ROOT VELOC PRESS
1	265	0.32	2.80	90	90	0.566
2	260	0.31	2.70	92	90	0.557
3	258	0.29	2.50	93	89	0.539
4	257	0.27	2.40	93	89	0.520
5	254	0.23	2.00	95	90	0.480
6	265	0.24	2.10	97	90	0.490
7	271	0.26	2.30	96	92	0.510
8	273	0.23	2.00	97	91	0.480
9	274	0.23	2.00	100	92	0.490
10	272	0.22	1.90	101	93	0.469
11	271	0.18	1.60	95	94	0.424
12	272	0.19	1.70	98	94	0.436
13	271	0.22	1.90	99	98	0.469
14	271	0.26	2.80	99	94	0.510
15	262	0.20	1.80	100	94	0.447
16	275	0.25	2.20	96	93	0.500
17	277	0.22	1.90	97	93	0.469
18	277	0.22	1.90	97	93	0.469
19	278	0.26	2.30	98	93	0.510
20	274	0.22	1.90	99	93	0.469
21	275	0.21	1.90	93	92	0.458
22	275	0.19	1.70	95	92	0.436
23	276	0.19	1.70	95	92	0.436
24	275	0.22	1.90	96	92	0.469
25	275	0.220	1.90	97.0	92	0.469
26						
27						
28						
29						
30						
AVG	270.1	0.234	2.07	96.1	92.2	0.4820

STACK GAS MOL WT, WET	26.13	AVG ABS STACK TEMP (d	730.1
STACK VELOCITY (ft/sec)	33.34	AVG ABS METER TEMP (d	554.1
STD VOL SAMPLED (std ft3)	48.10	METER LEAK RATE (ft3/	0.000
AVG METER TEMP (deg F)	94.14	SAMPLE VOL LK CORR'D	50.41
PERCENT MOISTURE (%)	26.11	AVG ABS STACK PRESS (	30.13
STD STACK FLOW RATE (DSCFM)	22962.55	VOL H2O IN METER GAS	16.99
		H2O IN GAS STREAM (vo	0.261
ISOKINETIC VARIATION (%)	105.16	NOZZLE AREA (ft2)	0.000680
PARTIC EMISSION RATE (lb/hr)	2.4774	STACK AREA (ft2)	21.333

(over)

1309 vt

PROPOSED TEST PLAN

Submitted to: MO Dept. of Natural Resources,
Air Pollution Control Program
P.O. Box 176, Jefferson City, MO 65102

588-2137

Date Submitted: AUGUST 3, 1994
Attention: DOUG ELLEY
Proposed Test Date: AUGUST 9, 1994

1.) FACILITY INFORMATION:

Name: WILLARD ASPHALT PAVING
Address: ROUTE 5, BOX 274
City: LEBANON | State: MO | Zip: 65536
Name & title of Contact Person: BRAD WILLARD
Phone No. of Contact Person: (417) 532-7107 | Fax No.: (417) 532-5962

2.) AIR POLLUTION SOURCE TO BE TESTED:

Type of Source: ASPHALT PLANT

Reason for Test:		
	X	Condition of Permit
		Consent Agreement
		Administrative Order
		Other (specify)

Permit No. of Source to Be Tested: 0494-021
Address of Source: LEBANON, MO.
Directions to Source (or map attached): 1mi. E. of LEBANON ON N. OUTER ROAD then 1mi. NORTH ON 44202
Initial Start-up Date:

3.) TESTING FIRM INFORMATION:

Name of Firm: RAMCON ENVIRONMENTAL CORP
Address: 6707 Fletcher Creek Cv.
City: Memphis | State: TN | Zip: 38133
Name & title of Contact Person: JOE SEWELL Vice PRESIDENT
Phone No. of Contact Person: (901) 387-0500 | Fax No.: 0400
Number of employees of firm: 30
No. of employees actually engaged in air pollution source testing: 30
Organizational chart with names & title of [redacted]: (please attach)

3.) TESTING FIRM INFORMATION: (cont.)	
Location & description of laboratory facilities: REC is located in Memphis, Tennessee. Facilities include A WET chemistry LAB, gas chromatography instrumentation laboratory, EQUIPMENT MAINTENANCE	
Subcontractor(s) utilized by firm for source testing activities:	
TRIANGLE LABORATORIES	
AMERICAN Interplex LABORATORIES	
Number of air pollution sources previously tested by firm:	1000 +
Sources tested by firm in Missouri in past 3 years (source, test, date):	
N.B. WEST CONTRACTORS	
Southern Clay	
Lucy Lee Hospital	
St. John's Regional Medical Center	

4.) PERFORMANCE TEST INFORMATION:

	Pollutant	No. of Sampling Points	Total Time per Test Run	No. of Test Runs	Test Method to be Used
1.	Particulate	12 9	60	3	METHOD 5
2.					9 ?
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					

PRELIMINARY METHOD 1 DATA

Duct to be Sampled: OUTLET Stack

CMI ASPHALT PLANT

Duct Dimensions:

From inside far wall to outside of port	72"
Nipple length	8"
Depth (or diameter) of duct	64"
Width (rectangular duct)	48"

Equivalent Diameter:

$D_e = \frac{2 \times \text{Depth} \times \text{Width}}{\text{Depth} + \text{Width}} = \frac{2(48)(64)}{(48+64)} = 54.9"$

Distance from Ports to Nearest Flow Disturbance

	Upstream	Downstream
Diameters	5.17	1.01
Diameters		

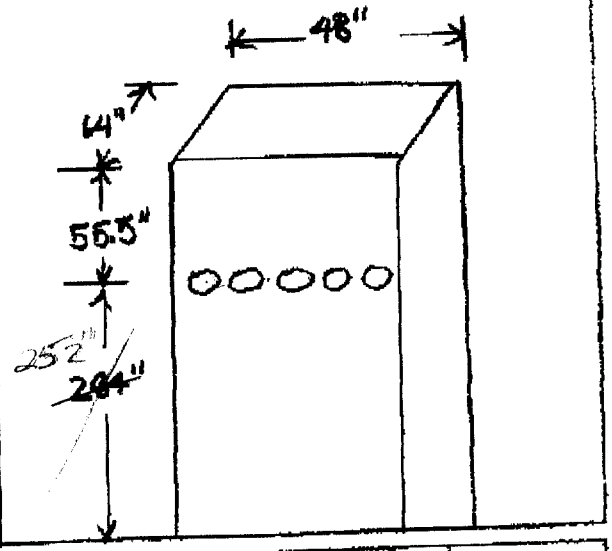
Stack Area = 3072 IN^2

Calculated by: WS

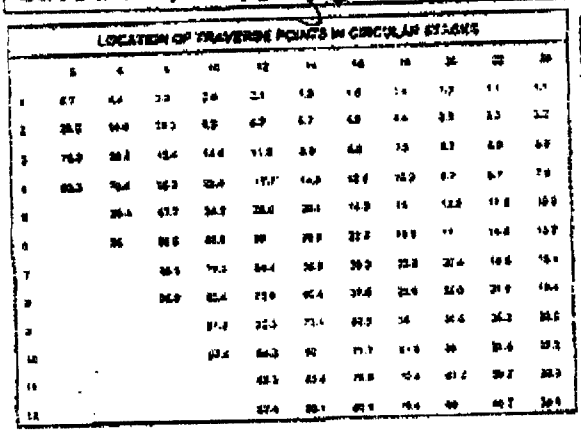
Sketch of Stack or Duct with Port Locations & Distances Shown:

22' 8"

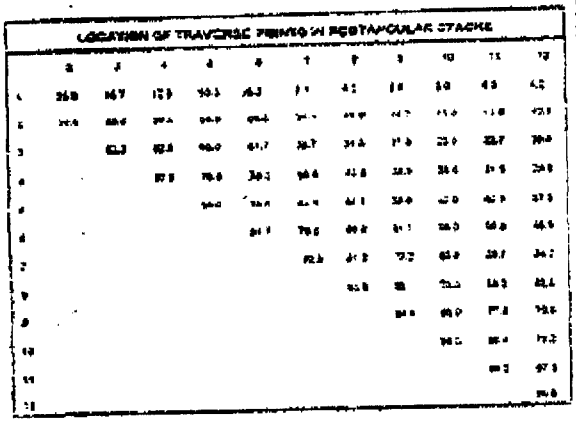
220
32
252



LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS



LOCATION OF TRAVERSE POINTS IN RECTANGULAR STACKS



POINT	% of Stack I.D.	Stack I.D.	Distance from Outside Wall	Nipple Length	Distance from Outside of Port
1		64"	5.3	8	13.3
2			16.0		24.0
3			26.7		34.7
4			37.3		45.3
5			48.0		56.0
6			58.7		66.7

NOTE: Cyclonic flow must be measured by instrument and shown to be absent prior to the initiation of sampling.

4.) GENERAL

A. Sampling Equipment Information:

The manufacturer and model of the sampling equipment to be used by the tester for the performance tests, along with a description of any equipment which may differ from that required by the specified method(s).

Andersen & Nutech

B. Test Procedures:

A description of any test procedures to be used in the conduct of the performance tests which may differ from the specified method(s).

NOTE: Deviations from EPA test methods observed during test procedures will not necessarily be corrected by agency observer and could result in agency rejection of test results.

C. Analytical Procedures:

A description of any analytical procedures which differ from the specified method(s).

D. Data Sheets:

A sample of all field data sheets which do not provide the data shown on the example sheets in 40 CFR 60 for the specified method(s).

E. Air Pollution Control Equipment:

Types and manufacturers of all control equipment:
C.M.I Computer Controls PA 320 S/N 103

Design or guarantee efficiency: to meet .04 grains per-DSCF

Design gas volume at full load (acfm): 71,500 ACFM

Design pressure drop: 2 to 6 inch's of water Colomn

Maintenance schedule and method of recordkeeping: Per CMI operations & Maintence manual

SPECIFIC for Asphaltic Concrete Plants

Provide a description of the source operation

A. Type of plant (continuous, batch, portable, permanent, dryer-drum):

C.M.I - Dryer Drum

B. Manufacturer, model & serial numbers of dryer and other major components:

C.M.I venturi mixer model P.V.M. 375 S/N 104
C M I aggregate Feed Bin PAB 432 S/N 160
C M I Roto Aire Baghouse RA-320 S/N 103

C. Rated capacity of unit (tons/hour): 300-400 T.P.H

D. Normal production rate (tons/hour): 200-300 T.P.H

E. Production rate anticipated for compliance test (tons/hour) (not to be exceeded, under authority granted by permit): 300 T.P.H

*this rate is not be exceeded during subsequent production, under the authority granted by the APCP permit

F. Type(s) of fuel (show percentages when more than one type of fuel is burned):	Normal fuel consumption rate:
No 2 Diesil	1.0 - 1.8 gal per ton

G. Normal operating schedule:

Monday thru Friday 7:00-6:00 March thru Dec.

H. Type of emission control device:

C M I Roto Aire Baghouse

I. Model and serial number: C.M.I-Roto Aire RA320 S/N 103

J. Spare bags/nozzles on hand:	X	YES		NO
K. Operable gauges/devices indicating pressure drop across device:	X	YES		NO
L. Water pressure gauge on scrubber:		YES		NO

RAMCON

ENVIRONMENTAL CORPORATION

August 1, 1994

Mr. Bradley Willard
Willard Asphalt Paving, Inc.
Route 5, Box 274
Lebanon, Missouri 65536
417/532-7107

Dear Mr. Willard:

Confirming our conversation, weather permitting, RAMCON Environmental Corporation will schedule the emissions test to be conducted at your facility located in Lebanon, Missouri. The test will be conducted on August 9, 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).

During the stack test, it will be the responsibility of your plant operator to complete the enclosed "Plant Data" pages which will be incorporated into the test report. Also, I strongly suggest you have your plant manager read over the enclosed "Stack Test Preparation Manual" as soon as possible.

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

GSBIII:vp
Enclosures

cc: Mr. Doug Elley
Missouri DNR
P.O. Box 176
Jefferson City, MO 65102
314/751-4817

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

PRETEST PROTOCOL

For Testing At:

WILLARD ASPHALT PAVING, INC.
Route 5, Box 274
Lebanon, Missouri

Permit No.: 0494-021

Plant Location:
Lebanon, Missouri

Plant Contact:
Bradley Willard
417/532-7107

EPA Contact:
Mr. Doug Elley
314/751-4817

PRE-TEST INFORMATION
for
WILLARD ASPHALT PAVING, INC.
by
RAMCON ENVIRONMENTAL CORPORATION

Test Date(s): August 9, 1994 Date: August 1, 1994

RAMCON Environmental Corporation has been contracted to perform a source emissions determination for Missouri EPA compliance at Willard Asphalt Paving, Inc.'s CMI Baghouse asphalt facility, Permit No.: 0494-021 located in Lebanon, Missouri. The targeted pollutant(s) have been established as particulate. The emission rate of the targeted pollutant(s) will be determined utilizing test methods and procedures as specified by EPA and the State of Missouri. These methods are provided below.

The determination of particulate will be performed in conjunction with the determination of the gas stream velocity and volumetric flow rate, molecular weight of the stack gas, and moisture percentage of the sample gas stream. These stack gas data values will be utilized for conversion of stack gas pollutant concentrations to emission values.

The test parameters will be sampled according to the following US EPA Reference Methods:

1. Reference Method 2: Determination of Stack Gas Velocity and Volumetric Flow Rate.

2. Reference Method 3: Determination of Stack Gas Molecular Weight.

3. Reference Method 4: Determination of Stack Gas Moisture Content.

4. Reference Method 5: Determination of Particulate Emissions.

Testing will consist of a minimum of three test runs of each respective test procedure as specified in FR 37936, July 25, 1977, as amended. The test report documenting the findings of this test project will be submitted within 30 days of the completion of the field operations.

The purpose of the test project is to determine if the rate of particulate emissions from the process exhaust stack is below or equal to the allowable emission set by the US EPA and the State of Missouri. The particulate matter allowable has been set forth by EPA and the State of Missouri as 0.04 grains per dry standard cubic foot (gr/dscf).

All sampling equipment calibration data will be available on the day of the test to the State of Missouri EPA representative observing the project. All data forms used for information collection and recording will be the same as those previously submitted to the State of Missouri.

All testing procedures listed above will be conducted as specified by EPA and the State of Missouri. No request for alternative methodology is necessary or requested for these determinations.

A diagram of the sampling location(s) is included in this document. This provides the physical configuration of the sampling location as well as the sample traverse locations that will be employed by the sampling crew.

If it is determined that this pre-test information document is deficient in content relative to the sampling project, please contact the person(s) listed below for rectification of the deficiency(s) prior to the start-up date of the source sampling.

RAMCON Contact Person: G. Sumner Buck, III Phone: (901) 387-0500

Sampling Site: The emissions test will be conducted on a rectangular stack measuring 48" x 64" with an equivalent diameter of 80". The sampling ports will be placed on the 55.5" down (.7 diameters upstream) from the top of the stack and 284" up (3.5 diameters downstream) from the last flow disturbance. Thirty (30) points will be sampled through each traverse for two minutes each for a total testing time of 60 minutes.

Points on a Diameter	Probe Mark
1	5.3"
2	16.0"
3	26.7"
4	37.3"
5	48.0"
6	58.7"